Handbooks in Health, Work, and Disability

Izabela Z. Schultz
Robert J. Gatchel *Editors*

Handbook of Return to Work

From Research to Practice

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Handbook of Return to Work

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Preface

This Handbook aims to integrate rapidly accumulating concepts, research evidence, and best practices in the expanding transdisciplinary field of return to work and stay at work. This domain is of high interest to occupational health and vocational rehabilitation professionals, clinicians, therapists, human resource professionals, disability and case managers, employers, health economists, policy makers, and other return to work stakeholders. The Handbook is also expected to strongly appeal to academics and researchers and graduate and postgraduate students in medicine, nursing, psychology, rehabilitation sciences, vocational rehabilitation, disability management, organizational management, and human resources. Currently, no single volume exists that synthesizes conceptual, methodological, and research advances in the return to work field, from both cross-diagnostic and diagnosis-specific perspectives, and translates them into practice.

The healthcare, compensation, insurance, and legal systems, together with employers in developed countries, have been challenged by rising disability, decreased productivity costs, and growing statistics. These challenges often involve nonvisible, complex, and still inadequately understood clinical conditions such as chronic musculoskeletal pain, common mental disorders, addictions, chronic fatigue, and cognitive impairments. At the same time, in recent years, more clinical and occupational research advances have occurred in the areas of traumatic brain injury, neurological and neuromuscular disorders, amputations, cancer, and serious mental illness; these areas also await more efforts at synthesis and in the translation of emerging evidence into return to work and stay at work practices. Despite the proliferation of basic science and clinical research on these diverse and disabling conditions, the translation of knowledge generated by this research into occupational and return to work solutions has lagged. To date, although most studies in the field have advanced the area of musculoskeletal pain, research on other conditions, especially cancer, mental disorders (depressive and anxiety disorders, Posttraumatic Stress Disorder, and serious mental illness), and cognitive disorders, have now started to accumulate more rapidly. This advancement has occurred in the context of growing recognition of the significance of return to work, employment maintenance, and productivity issues in populations with these diverse conditions from clinical, social, and economic viewpoints.

Our Handbook attempts to bridge the gap between new conceptual, methodological, and research developments in the field of return to work and the clinical, occupational, organizational, compensation, case management, and other stakeholder practices in the disability and return to work industry. The key stakeholders include individuals with conditions that produce return to work and employment challenges, healthcare, rehabilitation and compensation systems, employers, and society at large. Our Handbook constitutes a state-of-the art, integrated, evidence-informed resource to facilitate an exchange of knowledge between researchers and stakeholders and to promote the development of new clinical and occupational practices for return to work and new research directions. Not only will the reader be provided with knowledge of key concepts and methodologies (with inherent controversies involved), empirical evidence accumulated to date to guide practice and research, but also the essential components of a "how to" return to work toolbox: what, how, when, with whom, and why?

Return to work in our Handbook is understood broadly as a spectrum of occupational and economic *outcomes*, and as a complex multifaceted and multi-stakeholder intervention *process*. It covers emerging topics on the ability to sustain work and productivity following significant illness or injury. We advance an integrative, biopsychosocial perspective on return to work which takes a multisystem approach and places emphasis on individual "microsystem" factors, including medical, psychosocial, and functional characteristics interacting with organizational and workplace "mesosystem" characteristics, in the context of societal attitudes, culture, legislation, and policy "macrosystem" factors. The emphasis on this complex and dynamic interaction between a person and their environment in return to work research and practice is consistent with the main premises of the increasingly popular International Classification of Functioning Disability and Health (ICF) model.

Notably, particular attention is given to complex clinical conditions that pose major return to work challenges and have significant negative personal, social, occupational, and cost implications-which could be averted. Although, given the current state of knowledge, not all negative outcomes are preventable. Major positive changes in stakeholder systems, policies, and practices applied with these conditions can be affected. These changes require consistent advancement of newly integrated evidence-informed approaches to early disability prediction and risk identification, selection and implementation of clinical and occupational interventions targeting modifiable risk factors, outcome measurement, and, most importantly, design of comprehensive, measurable, implementable, and cost-effective return to work models and approaches. These approaches range from cross-diagnostic to diagnosis-specific and target modifiable risk factors for poor return to work outcomes; they are dependant on return to work circumstances and emphasize attention on positive predictors of sustained return to work.

There are five parts covered in this Handbook. Part I, "Concepts and Models of Return to Work," discusses the following: relationships among impairment, disability and return to work, models of return to work including the application of the World Health Organization's ICF model of health, the new concept of the "margin of maneuver" in return to work, motivational aspects of return to work, as well as organizational, social, cultural, policy, and behavioral dimensions of return to work.

Part II of the Handbook, "Measurement and Methodological Issues: Towards Transdisciplinarity," covers an integrative framework for barriers and facilitators in return to work planning, current outcome measurement and methodological, assessment and program evaluation challenges, and related state-of-the-art solutions.

Part III, "Evidence Informed Return to Work Approaches," provides a comprehensive review of evidentiary basis for return to work, including integration of clinical and occupational interventions, early intervention, work accommodations, a spectrum of workplace interventions, participatory ergonomics and ergonomic solutions, working with stakeholders, organizational and policy approaches, cognitive-behavioral interventions, motivational interviewing, economic perspectives on disability management and return to work interventions, and a universal approach in return to work.

Part IV, "Best Return to Work Interventions & Practices in Key Diagnoses," reviews best return to work practices in the most prevalent and challenging diagnoses encountered in occupational settings: chronic musculoskeletal pain, brain injury, mild cognitive impairments, anxiety disorders, Posttraumatic Stress Disorder, depression, serious mental illness, addictions, spinal cord injury, multiple sclerosis, epilepsy, cancer, major limb loss, as well as fibromyalgia and chronic fatigue syndrome.

Finally, Part V, "Research, Policy and Practice Directions," provides a summary of recommendations across the spectrum of conditions and disabilities that would promote improved practices in return to work, as well as stay at work outcomes, research advances in the field, and health, disability, and social policy.

Importantly, in keeping with our Handbook's transdisciplinary approach to return to work and stay at work issues, our chapter contributors are international researchers, professional experts, leaders, and innovators in a wide range of relevant disciplines and areas of scholarly inquiry, including various medical, health, and psychology specialties, occupational, social, and organizational sciences, and even architecture. Our chapter contributors span continental divides, coming from the United States, Canada, the European Union (including United Kingdom, The Netherlands, France, Finland, and Sweden), and Switzerland. As Editors, we appreciate their pioneering efforts to bring this integrative *Handbook of Return to Work*: *From Research to Practice* to our readers.

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Contents

Part I Concepts and Models of Return to Work

Part II Measurement and Methodological Issues: Towards Transdisciplinarity

Part III Evidence Informed Return to Work Approaches

Part IV Best Return to Work Interventions and Practices in Key Diagnoses

Part V Research, Policy, and Practice Directions

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Part I

Concepts and Models of Return to Work

1 Impairment, Disability, and Return to Work

Izabela Z. Schultz, Catherine M. Chlebak,
and Alison M. Stewart

1.1 Introduction

Developing an effective model of occupational disability prediction in research and practice is a central issue in the relationship among impairment, disability, and return to work (RTW). For example, to what degree, when, and how does low back pain affect work performance and employability? Under what conditions can persons with mild traumatic brain injuries work? Can Post-Traumatic Stress Disorder be disabling from work at all? What kind of functional limitations do cancer survivors have and when are they safe returning to work? None of these questions can be answered unequivocally on the basis of current research evidence. Ambiguity and a multiplicity of definitions associated with the foundational concepts of disability and impairment constitute major barriers for developing evidence-based guidelines needed by healthcare treatment providers, compensation and forensic (insurance) systems, and employers; applications for prevention and reduction of work disability are also adversely affected. Further complicating the matter, somewhat limited graduate and postgraduate training opportunities exist in the field of disability, assessment of impairment, and return to work (Schultz 2009). Conceptual, research and best practice developments have not yet met the demands of stressed compensation systems, challenged by increasing disability claim rates, in particular those involving more complex disabilities, including mental health and pain disorders (e.g., Furlan et al. 2012; Gnam 2005). We aim to dissect these quagmires and argue for an integrated cross-diagnostic biopsychosocial model to determine occupational disability, regardless of the clinical nature of disability.

1.2 Perspectives and Theories on Disability, Impairment, and Return to Work

1.2.1 Theoretical Foundations

In the literature, definitions of impairment are usually embedded within definitions and models of disability. Historically, research has been fragmented and governed by frameworks that are difficult to compare. Three major theoretical schools affected the development of models and definitions of disability: social construction, biomedical, and biopsychosocial (Bickenbach et al. 1999; Lutz and Bowers 2007; Schultz et al. 2007, 2011a, b). Please see Knauf and Schultz's chapter in this Handbook for a historical review.

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The biopsychosocial theory integrates clinical impairment into a system-based approach. The most recent iteration is the World Health Organization's (WHO) International Classification of Functioning, Disability, and Health model (ICF; WHO 2001). Here, the biopsychosocial model of disability is viewed as a "workable compromise between medical and social models" (WHO 2011 p. 4) and, in the last two decades, also provides a framework for a synthesis of forensic and medical concepts (Schultz 2008; Schultz and Stewart 2008). In its most recent iteration, the interdisciplinary biopsychosocial paradigm now "constitutes the most consensual framework for understanding the multidimensional nature of disability" (Schultz 2008 p. 95). This current ICF model was recently adopted by the American Medical Association for its Guides to the Evaluation of Permanent Impairment, replacing antiquated medical language (Rondinelli 2009; WHO 1980, 2001).

Within the ICF model, disablement is conceptualized as a difficulty encountered with any or all interconnected functional areas: impairments (problems with body structure or structure), activity limitations, and participation restrictions. It refers to the "negative aspects of the interaction between an individual (with a health condition) and that individual's contextual factors (environmental and personal factors)" (WHO 2011 p. 4).

Bickenbach et al. (1999) described the implications of these dimensions on clinical and systemic interventions. At the level of impairment, medical or rehabilitative responses are the most appropriate, and in this sense, the medical model is an accurate representation of disablement. Activity limitations are identified by evaluating a person's performance against a standardized environment. Here, appropriate responses are to strive to extend the range of the person's own capabilities through rehabilitation to compensate for activity limitations. Finally, at the level of individual participation, where social and physical environment are taken into account, primary interventions either remove environmental barriers to full participation or provide environmental facilitators.

Biomedical, social construction, and biopsychosocial theoretical constructs of disability are reflected, in varying degrees and interactions, in three distinct applied perspectives on disability: legal and administrative, clinical, and scholarly research (Altman 2001).

1.2.2 Applied Perspectives and Definitions

1.2.2.1 Legal and Administration Systems

Due to legal ramifications with the concept of disability in rights, benefits, and responsibilities, various administrative bodies form their own definitions of disability. Most often, disability is defined as "situations associated with injury, health, or physical conditions that create specific limitations that have lasted (or are expected to last) for a named period of time" (Altman 2001 p. 98). In the public arena, for example within the Americans with Disabilities Act (ADA 1990), broad definitions of disability have gradually replaced narrower, function-specific disabilities. ADA defines disability as: (1) a physical or mental impairment that substantially limits one or more of the major life activities of such individuals, (2) a record of such impairment, or (3) being regarded as having such an impairment (Sec. 3 [2] 42 U.S.C. 12102 1990). Mental impairment is defined as "any emotional or psychological disorder, such as mental retardation, organic brain syndrome, emotional or mental illness, or specific learning disabilities" (29CFR Part 1630.1[h2]). These definitions come from biomedical tradition and the social model perspective on aspects of function: classification as an "individual with disability" requires documentation of a physical, psychiatric, cognitive, and/or intellectual condition or multiple mental impairment conditions, evidence of discrimination and/or stigma, and a significant limitation in at least one major life activity (Schultz 2008; Smart 2009). The relationships of these models are undefined, creating fodder for ongoing legal difficulties (Schultz 2008).

Disability compensation systems, however, including workers' compensation and long-term disability insurance companies, have historically preferred narrower and specifically functionally focused definitions, with emphasis on "objective proof" of impairment leading to work disability. These opposite trends, one focusing on broadening the scope of definition to ensure equal rights for persons with disability and the other narrowing the scope to make compensability objectively verifiable and financially viable for the institutions granting disability status, continue to show divergence.

1.2.2.2 Clinical Framework

Clinical definitions of disability focus on identification, qualification, and quantification of pathology by medical practitioners for prediction (prognosis) of future function. The type of condition and individual characteristics of the patient are the basis of such predictions. Since 1958, the American Medical Association (AMA) has developed and disseminated evaluation guidelines to both standardize and create best practices around the impairment determination process, i.e., AMA Guides to the Evaluation of Permanent Impairment (AMA Guides). Primarily, the Guides are applied to assess loss compensation due to illness or injury within compensation and legal settings (Rondinelli 2010).

The most recent Guides defined impairment as "a significant deviation, loss, or loss of use of any body structure or body function in an individual with a health condition, disorder, or disease" (Rondinelli 2009 p. 5). This definition differs from the Guides Fifth Edition by shifting from an exclusive medically based approach to a biopsychosocial one advocated by the ICF (WHO 2001): "function" includes physiological and psychological elements and "structure" retains an exclusively medical focus (Rondinelli 2009). For the medical community, questions and difficulty have emerged for some: the change has created an "ambiguous position where impairment seems to require framing in the context of its functional consequences" (Bellamy and Campbell 2009).

For the AMA, disability is therefore defined within the impairment context as a participation or activity limitation in domains such as home, society, and work (Rondinelli 2009). Conceptualized as "a relational outcome," disability reflects the individual's capacity to perform a specific task or activity within a specific environmental condition (Brandt and Pope 1997). The WHO views disability as "an outcome or result of the complex relationship between an individual's health condition and personal factors, and of the external factors that represent the circumstances in which an individual lives" (p. 17). Disability is expressed by "activity limitations" (p. 213), where activity is understood as a task execution such as driving or writing, and "participation restrictions," defined by interactions that impact experiencing life (2001). The definitions are viewed as "similar" (p. 12) in the eyes of the AMA; as named above, they have most recently assumed the ICF's terminology around disablement (Rondinelli and Eskay-Auerbach 2009). Furthermore, these recent Guides have also adopted the conceptual framework of disablement—based on a biopsychosocial model—as proposed by the ICF. This model will be discussed in more depth in a following section.

Five new axioms were developed by the AMA Guides Sixth Edition to articulate the paradigm shift, define priorities, and provide direction around diagnosis, use of evidence-based practices, practicability, and methodological congruity (Rondinelli 2009). These axioms aim to address criticisms around validity and reliability issues of the rating system by providing a "framework for directions and priorities" (Rondinelli and Eskay-Auerbach 2009 p. 9). As well, the new assessment approach focuses on function through reducing unreliable measures (e.g., range of motion) and introducing functional inquiry evidence, clinical study reference, and physical examination to their multi-method approach (Rondinelli 2009).

However, difficulty remains. The historical dependency on expert opinion, consensus, and intuition has created measurement issues that continue in the most recent Guides; this includes the tentative research measurement properties within the developed procedures of the AMA

Guide. The movement to adopt a more biopsychosocial approach has added more challenges, as articulated in AMA Guides Sixth Edition:

> Diagnosis should be evidence-based, however, the impact of injury or illness is dependent on factors beyond physical and psychological aspects including biopsychosocial, behavioral and contextual issues. Therefore, it is more challenging to obtain data needed to define an evidence-based approach to impairment assessment (Rondinelli 2009 p. 9).

Difficulty persists in assessing complex conditions, such as pain or mental health/psychiatric disability. For example, with low back pain, the most common work disability, serious doubts were raised in the past regarding the reliability of the AMA-based physical examination of range of motion in the AMA Guides Forth Edition (Zuberbier et al. 2001). AMA Guides Sixth Edition, as part of the five new axioms, calculates impairment ratings for the spine not by the range of motion method but through a diagnosis such as spinal stenosis. Essentially, a shift has been made in primary diagnosis; its focus on anatomic lesions has evolved to focus on most organ systems (Rondinelli and Eskay-Auerbach 2009).

Rondinelli (2009) voiced that the AMA Guides Sixth Edition, as a whole, has moderately lower impairment ratings and minimal reliability improvements when compared to the Fifth Edition. On the other hand, Forst et al. (2010) stated that both Guides (i.e., Fifth and Sixth Editions) are generally considered "relatively reliable and consistent tools for rating impairment" (p. 1202). AMA has refuted both of these assertions as "perfunctory and trivial… and statistically unfounded" but acknowledges that impairment ratings are currently "consensus based" for lower back injuries (Rondinelli 2010 p. 1205).

With psychiatric disabilities, the determination of permanent impairment in the AMA Guides Sixth Edition is considered more structured (e.g., development of an impairment rating) when compared to the Guides Fourth and Fifth Editions. However, reliability, validity, or acceptability is neither discussed nor described (Bellamy and Campbell 2009). The clinical definitions of impairment and disability, unlike legal and administrative definitions, must adhere to methodological standards of measurability, reliability, and validity of the evaluative approach.

1.2.2.3 Scholarly Research

Research definitions of disability, particularly occupational disability, are even more diverse than the legal and clinical definitions. While it is commonly recognized that a biopsychosocial frame is necessary to understand and treat work disability, a clear definition for work disability is needed to accurately assess work outcomes (Brede et al. 2015). Definitions of work disability encountered in the rehabilitation outcome literature are either clinically or economically derived and tend to fall into one of the following seven categories:

1. Self-report of disability by an individual with disability; e.g., the Sickness Impact Profile (Bergner et al. 1981; Gilson et al. 1975), the increasingly popular Work Limitations Questionnaire (Lerner et al. 2001), Stanford Presenteeism Scale (Koopman et al. 2002), Health and Work Performance Questionnaire (Kessler et al. 2003), Lam Employment Absence and Productivity Scale (Lam et al. 2009), Work Ability Index (Ilmarinen 2009), and various other Disability Indices;
2. Report of disability by a collateral source, such as a clinician and/or significant other;
3. RTW and/or employability, including cycling between disability and RTW and repeating patterns of work absences;
4. Duration of disability;
5. Ability to sustain employment after RTW;
6. Healthcare and wage loss based costs of disability; or
7. Healthcare utilization (Schultz 2008; Schultz et al. 2007; Brede et al. 2015).

For legal and clinical definitions and related disability determination methodologies to have relevance, reliability, and validity, fair applications are essential with persons with disabilities and evidence-based, systematic, empirical research needs to be accumulated. However, significant challenges emerge in achieving this goal. Young, Roessler et al. (2005) reported that stakeholders—including compensation systems, the government, health care, societal institutions, and employers—are vested in their own desired disability outcomes, including related research. More emphasis is needed on cooperation and collaboration among stakeholders (Shaw 2015).

In contrast to the traditional binary (yes-no) outcome of RTW, continuous measures of presenteeism, or health-related suboptimal work performance, have been advanced. Main and Shaw (2015) list a number of these instruments and the various challenges of measuring productivity of the returning worker. Questions remain regarding clarification of the concept of worker productivity as well as the reliability and validity of these various measures (Main and Shaw 2015). Importantly, a number of different variables, including biomechanical and psychosocial work risk factors, need to be considered in the prediction of work-related outcomes, including that of presenteeism. Further, Elfering et al. (2006) determined that most common measures of work-related outcomes lack specificity and need to be adjusted against sick leave absence, as well as work-related attitudes and the influence of social context. Due to the varying levels of psychometric strength and generalizability of these recently developed instruments, further research is needed to assess their effectiveness in predicting the productivity of the returning worker and work-related outcomes.

The multiplicity of definitions and related methodological approaches creates difficulties in integrating research on the relationship between impairment and disability (Linton et al. 2005; Pransky et al. 2005). A systematic review of screening instruments that predict work disability (Melloh et al. 2009) identified the need to use a biopsychosocial model when considering the influence of occupational factors, which were found to be the most reliable in predicting work disability for patients with back pain. Leeuw et al.'s (2007) review of the fear-avoidance model emphasizes the importance of further research on the role of contextual factors in disability. Similarly, a review by Shaw et al. (2009) further identified the need for greater conceptual clarity in patient screening methods that need to consider occupational factors, which have been identified as predictors of failure to return to work (Iles et al. 2008; Sullivan et al. 2005). It remains unclear which occupational factors are most important, how they interact, and how they affect RTW outcomes (Nicholas et al. 2011). Moreover, the RTW process is not disease-specific (Hees et al. 2012) and needs to consider not only the worker's biopsychosocial context but also the actual RTW process itself (Leyshon and Shaw 2012).

The substantial, accumulated body of quantitative and qualitative research evidence is below the level to conceptualize the biopsychosocial model as a theory; achieving an acceptable level of specificity is thus difficult for systematic, empirical validation for the disability field, particularly in the occupational area (Imrie 2004). The largely market-driven disability determination industry has expanded exponentially without considering measurement properties (particularly validity evidence). Finally, the prediction of disability, early identification of high-risk individuals, and prevention of disability have been hampered in research, clinical, and administrative applications (Schultz 2005).

Overall, the emerging disability definitions are cross-categorical, cross-diagnostic, and oriented to function. In fact, the most common factor in medico-legal definitions of disability has been a function emphasis. This occurs despite viewing disability on a continuum versus being defined by dichotomy ("yes" or "no") and having a variety of disability classifications available (e.g., acquired versus congenital, severe versus mild, mental versus physical, stigmatizing versus non-stigmatizing, visible versus non-visible) (Schultz 2008; Smart 2009).

1.2.3 Conceptualization of Return to Work

Occupational disability status and RTW are frequently and misleadingly equated—RTW is one possible economic or social disability outcome (Schultz et al. 2007). Difficulty in addressing this issue is apparent due to an unclear RTW definition in the occupational disability field (Young, et al. 2005). RTW has been operationalized as both an outcome and a process measure (compared to work disability which normally is defined as reduced productivity, time off of work, or working with functional limitations as an outcome). RTW has also been understood as a "process" of returning an injured worker back into the workforce (e.g., job accommodation) or a final, measurable, common disability outcome (Krause et al. 2001; Schultz et al. 2007; Young, et al. 2005).

To complicate the matter, RTW outcomes are multifaceted and may involve returning to the pre-injury job, pre-injury employer, new employer, and work with or without accommodation; this aligns with the observed, wide variance of stakeholder-dependent definitions and practice related to the RTW definition (Franche and Krause 2002; Krause et al. 2001; Stowell and McGeary 2005; Young et al. 2005).

Recurring pain-related and psychological conditions are not captured well within the conventional RTW outcome framework, defined as a single RTW event. They deserve serious consideration (Linton et al. 2005). Other outcome patterns, such as unemployment, retirement, and involuntary termination also need to be considered (Schultz 2008). Moreover, the outcome of sustained return to work is now of particular interest to stakeholders and has emerging research. Importantly, recognition of strengths and limitations of the primary outcome measurement sources in RTW research, particularly administrative data and self-report, is recommended (Schultz et al. 2007).

Difficulties in developing a cohesive RTW model are apparent as well. Within personal injury and law, RTW often is represented as static with a focus on "readiness for return to work" (Franche and Krause 2002; Young et al. 2005), instead of as dynamic, variable, and developmental (Schultz 2008; Schultz et al. 2007). Furthermore, research evidence, especially in musculoskeletal conditions, is accumulating with respect to identification of disability and RTW predictive factors in injured workers (Schultz 2009). Notably, research consensus is building that disability prediction models share certain common characteristics, including psychosocial and workplace factors, and can thus be advanced cross-diagnostically (e.g., White et al. 2013) and utilized to guide primary prevention efforts, especially at work. However, concurrently, condition-specific, empirically supported multivariate models are being developed for different disorders and contexts to facilitate identification of at-risk subpopulations and provide secondary prevention and early intervention (Crook et al. 2002; Gatchel and Kishino 2013; Schultz 2009; Schultz et al. 2015; Schultz et al. 2007; Schultz and Stewart 2008). Importantly, improved understanding of differences among disability prediction models would provide more guidance and clarity for clinicians involved in prognoses for injury cases (Schultz 2008, 2009).

In the last decade, a number of promising advancements in the conceptualization of impairment, disability, and RTW have been explored. One is an approach called the "developmental approach to RTW" proposed by Young, Roessler et al. (2005); a stage-driven concept where the injured worker progresses through being off work, re-entry, maintenance, and then finally, advancement. Currently, the stages appear similar to descriptive phases versus clear stages where risk factors are identified and allow for dynamic, individualized application. Also, more research is needed to substantiate this approach. Another contribution is a promising model related to Prochaska's readiness for change model. The original model describes change in stages of precontemplation, contemplation, preparation, action, and maintenance (Prochaska et al. 1994). In the revised version, Franche and Krause (2002) adapted it for understanding RTW behavior. The constructs of self-efficacy, decisional balance, general motivational state, and change processes, together with relationships among these concepts, were introduced to explain readiness to RTW. Although promising, this new model requires empirical validation before usage in individual clinical cases within the compensated injury realm because it lacks definitional consensus and has difficulty in the measurement of foundational psychological concepts (Schultz 2008).

1.3 Integrative Models of Impairment and Disability: From Linear to Multidimensional

The best known definitions of disability, including those from the World Health Organization (1980; 2001), the National Institute of Medicine (Brandt and Pope 1997; Pope and Tarlov 1991), the Quebec model (Fougeyrollas and Beauregard 2001), Nagi's model (1965, 1977, 1991) and Verbrugge and Jette's model (1994), despite conceptual, terminological, and developmental intent differences share several common components. These basic conceptual components have been identified by Altman (2001) and include the following:

1. *Pathology*. Understood variably as an interruption in body processes, which requires restoration, medically identified biochemical and physiological abnormalities, or a key aspect of disease, which also incorporates etiology and manifestation.
2. *Impairment*. Conceptualized as anatomical or physiological abnormalities and losses, dysfunctions, and significant structural abnormalities in specific body systems, loss or abnormality of mental, physical, or biochemical function or structure, or generally as problems in body function and structure.
3. *Functional limitations*. Defined implicitly or explicitly as physical or mental restrictions that the impairments pose on performance of tasks of daily function and/or fulfillment of social roles. The term "activity limitations" (WHO 2001 p. 213) denotes functional limitations; this evolvement occurred from parsing the concept of impairment into "impairment of structure" and "impairment of function" and from boundary clarification between the definitions of impairment and disability.
4. *Outcomes*. Conceptualized as the following: (1) a "pattern of behavior that evolves in situations of x or continued impairments that are associated with functional limitations" (Nagi 1965 p. 103), (2) "the expression of a physical or mental limitation in a social context–the gap between a person's capabilities and the demands of the environment" (Pope and Tarlov 1991 p. 81), (3) difficulty performing life activities due to physical problems (Verbrugge and Jette 1994), or (4) an individual's "involvement in a life situation" in relation to health conditions, body functions and structures, activities, and contextual factors (WHO 2001 p. 14).
5. *Contextual factors*. Related to personal background and environmental factors and demands, as stipulated in the 2001) model and in the AMA Guides' Model (1993; Cocchiarella and Andersson 2000).

Several integrative models regarding the relationship between impairment and disability have been postulated in the literature—one being Nagi's (1965) classical model. Altman (2001) argued that this model has been misunderstood in the literature as implying a linear relationship between impairment and disability mediated by functional impairment. In fact, in the adopted model, the relationship between impairment and disability is nonlinear and mediated by interactions between (1) pathology and functional limitations, (2) impairments and functional limitations, and (3) functional limitations, impairments, and role restrictions.

Another important model is the ICF Model of Disability (WHO 2001), intended to be a worldwide reference when examining individual functioning and disability. It shows a complex and dynamic interaction between disability, impairment, and other personal and contextual factors. Impairment is conceptualized as reflecting a reciprocal relationship with activity. Activity, in turn, is a component of the reciprocal interaction with participation. Contextual factors, including both environmental and personal factors, are conceptualized as mediating the relationship between impairment and disability. Peterson and Threats (in press) stipulated that the greatest contribution of the ICF's framework and the biopsychosocial model is the ability to "target our interventions and measure healthcare outcomes in a nontraditional manner that takes into account critical contextual factors that are often not a focus of clinical attention in health care." Please see the chapter by Knauf and Schultz in this Handbook for a more detailed review of this model in the context of other models.

In 2004, the WHO created an instrument for assessing disability and health in adults, termed the Disability Assessment Schedule 2.0 (WHODAS 2.0; Federici and Meloni 2013); it follows the ICF model by including participation and activity dimensions and by incorporating an individual's functioning in life domains. This measure supersedes the 1988 Disability Assessment Schedule for function assessment (WHO/DAS), used primarily to assess psychiatric inpatients. The WHODAS 2.0 is described as a generic, cross-cultural, easy and quick (i.e., 5–20 min) to administer tool with excellent psychometric properties. Its usage extends to both general and clinical population settings (WHO 2013). Of interest, it has been validated for chronic diseases including chronic back pain, traumatic brain injury, and serious mental health conditions, such as bipolar disorder and depression (Garin et al. 2010). Federici and Meloni (2013), in their extensive review of existing research on this instrument, found that broad consensus on the WHODAS 2.0's validity and reliability has been established, together with a conceptual alignment between the ICF capacity codes and this instrument. However, more research data is needed with respect to cross-cultural applicability and psychometric properties. For example, the standardized scores for different translations are not available. This instrument may not be appropriate for some populations, such as patients with psychiatric disabilities (Federici and Meloni 2013) or those in a community rehabilitation setting (Kulnik and Nikoleou 2013).

Despite advances, limitations exist with the ICF model itself. Schultz (2008) reported that minimal advances within the psychological injury and law field have occurred. The ICF model has been criticized for a lack of specificity around inclusion of the biopsychosocial theory and an atheoretical impairment definition, with an overfocus on concepts such as "universalism" and "system harmony" and vagueness in underlying biopsychosocial theory constructs (Imrie 2004). However, some practice-specific tools have emerged to address this generic approach criticism (e.g., Steiner et al. 2002; van der Ploeg 2004). Dahl (2002) noted that ICF theory development may have evolved from consensus building versus a specific theoretical construction method; this assumption could make the ICF model vulnerable to economic, political, and social perspectives and lead to knowledge mobilization issues for occupational research and practice (Schultz et al. 2007). Notably, according to Rondinelli and Eskay-Auerbach (2009), the inclusion of both psychological and physical parameters with the ICF's medical definition "reflects the ongoing debate about whether disability is purely a medical issue that requires medical intervention or a social issue in which the synergistic interaction between the physical and social factors is responsible for disability" (p. 12).

A review of current conceptual models of the relationship between impairment and disability underscores the difficulty to operationalize in research and practice due to their multidimensional and interactive natures and because of imprecise definitions. Presently, each component exists with multiple definitions and can be reduced into more specific elements. As a result, the chasm between theory and empirical-observational investigation is too significant to be easily bridged. Moreover, current studies capturing the relationship between impairment and disability are largely atheoretical and collect evidence on specific clinical conditions to expand knowledge of the condition and its functional impact, rather than contribute to validation of any particular conceptual model. However, with the expanding applications of the ICF model (Escorpizo et al. 2015; Peterson and Threats in press), considerable advancements in the ICF model research, applications, and progress have occurred. This includes understanding diagnosis-specific and cross-diagnostic, modifiable and non-modifiable predictors of occupational disability, development of evidence-validated biopsychosocial predictive models, and early intervention approaches for clinical and occupational uses. However, the model continues to be an ongoing challenge for RTW researchers, clinicians, and stakeholders (Shaw 2015; White et al. 2015).

At present, research studies still pay insufficient attention to contextual components of disability in general and of work disability specifically, especially with respect to workplace organizational factors and social context (Shaw 2015; Tjulin and McEachen 2015; White et al. 2013; 2015). Contextual factors mediating the relationship between impairment and disability, such as the interaction between individual (personal) characteristics on one side and, on the other, systemic factors arising from health care, compensation, workplace, and other social systems, are still not adequately accounted for in research. It is of concern that while the traditional biomedical model implying linear relationships between impairment and disability has given way gradually to the multidimensional biopsychosocial model in both research and practice, this is not necessarily so in medico-legal applications, such as those arising in disability compensation settings.

1.4 Common Misconceptions in Clinical Models

Despite recent theoretical, research, and clinical practice advancing the understanding between impairment, occupational disability, and RTW, persistent misconceptions limit progress.

1.4.1 Terminology Confusion and Medico-Legal Concerns

From a medico-legal perspective, the concepts of impairment and disability continue to be used interchangeably in both research and clinical literature and in practice. Ambiguity, theory complexity, and multiplicity around these definitions and RTW create significant barriers in knowledge advancement in multiple arenas including occupational, forensic, legal, and clinical (Schultz et al. 2007). Clinicians frequently render opinions of disability instead of focusing on impairment determination and its impacts on the individual's work performance, both currently and in the future, and on measurement. Such opinions should be reserved, at a professional level, to vocational experts, who are qualified to evaluate the context in which impairment occurs, i.e., labor market, availability of jobs in the area, and work accommodation options, and therefore to contribute, based on clinical impairment and contextual findings, directly to disability determination. However, ultimately, the decisions regarding entitlement to disability status are reserved to triers of fact in the legal system including judges and adjudicators of such disability status.

Confusion between impairment and disability in clinical practices has likely stemmed from lack of clarity and interchangeable term use in various legal statutes and policies underlying disability determination systems such as workers' compensation, long-term disability, and social security insurance systems.

Notably, the AMA Guides, which govern the single most influential definitions of impairment and disability for clinical purposes, have created more distinction between these definitions in the Sixth Edition with the adoption of the ICF model. Previous editions (i.e., Fifth and Fourth) blurred the distinction between impairment and disability. For example, the inclusion of the term "organ function" (in absence of its definition) in their definition of impairment, despite an attempt to discriminate between "anatomic" and "functional" losses (AMA 1993; Cocchiarella and Andersson 2000). Another difficulty, which persists today despite efforts of improvement, is in complex disability determination cases (i.e., in the evaluation of psychiatric, neuropsychiatric, and pain-related disorders); here, the biomedical model which focuses on functional limitations is applied over a more holistic and thus more appropriate biopsychosocial approach. In these complex conditions, the functional focus in impairment evaluation becomes frequently inseparable from the evaluation of the capacity to meet personal, social, and occupational demands, i.e., disability.

In determining psychiatric impairment, the requirement to evaluate daily function, concentration, persistence, pace, social functioning, and adaptability in stressful circumstances within the work setting is not sufficiently operationally defined to allow for reliable and valid disability determinations. Likewise, the AMA Guides' recommendations around determining pain-related impairment are similarly functionally oriented in the areas of daily living activities and activity limitations. Notably, this method incorporates assessment factors not typically found in physical examinations; namely, assessments of a person's credibility where valid and reliable clinical assessment instruments do not yet exist, and the assessment of emotional status. This inclusion likely compounds the conceptual and methodological problems in determining impairment.

Complicating the matter, clinically estimated impairment ratings are often used in compensation systems as a proxy for disability without considering work-related contextual demands or performing employability assessments. This practice reflects the lack of evidence supported decision-making systems for translating impairment into both an occupational disability determination and ratings completed by compensation systems for entitlement purposes (Schultz 2003).

1.4.2 Linear Relationship Assumption among Impairment, Disability, and Return to Work

Despite current evidence and professed assurances affirming usage of a multidimensional and biopsychosocial model to describe the relationships among impairment, disability, and RTW, both clinical practice and research continue to reflect a linear relationship, which forms the cornerstone of biomedical and forensic (insurance) models of disability (Knauf and Schultz 2015; Schultz et al. 2000; 2007). These existing models continue to adversely affect practices in disability determination, prediction, and interventions; those with highly prevalent and work-disabling conditions that require a biopsychosocial approach; psychological, neuropsychological, and musculoskeletal pain conditions are particularly vulnerable.

However, the expansion of the biopsychosocial ICF model in research and practice, including adoption of the ICF model by the AMA in their Guides Sixth Edition, presents a step forward in addressing a more complex and dynamic relationship among impairment, disability, and RTW in clinical practice and research.

1.4.3 Excessive Reliance on Impairment Evaluation While Neglecting Workplace Environment

Within disability determination in both research and practice, a lack of discrimination between impairment and occupational disability is often associated with an excessive reliance on impairment in the absence of its contextualization. In particular, the compensation systems and courts in charge of legal disability determination frequently rely excessively on medical and psychological descriptions and ratings of impairment. This reliance is often to the detriment of factoring in the employment-related context including the labor market, availability of jobs, workplace characteristics, job accommodation, transitional RTW programs, and specific work duties and responsibilities.

Work and workplace characteristics are rarely considered in clinical and medico-legal disability determinations although they are now more systematically investigated in research and included in work disability prediction models (e.g., White et al. 2013; 2015). Importantly, the following work-related factors predictive of absence at work are supported by strong research evidence: lack of social support, job strain, increased physical and psychological demands, low job satisfaction, lack of supervisory support, and lack of worker control (White et al. 2013). Yet these empirically validated factors, best conceptualized within the demand-control-support model of occupational stress, are not included routinely in disability determinations completed by clinicians and rehabilitation professionals in practice. In such determinations, especially those involving mental health and pain disorders, a systematic evaluation of physical, emotional, social, cognitive, and language demands, speed and productivity demands, degree of structure and support, flexibility in scheduling tasks and activities, availability and type of supervision and performance coaching, skill discretion, availability of breaks, shift work, and access to physical and psychological job accommodations is recommended (Schultz 2003). Moreover, outcomes of vocational rehabilitation are not commonly built into disability prediction models both in research and practice.

Although disability determination needs to be a "dynamic, reciprocal and temporal process evolving over time with changes in personal, health, and environmental factors" (Schultz 2009 p. 6), this notion rarely translates to administrative applications. Also, different impairment evaluation methodologies produce different results, raising the question of criteria for the selection of the right methodology for the right application and a larger societal question of fairness. An interesting evolvement has occurred with the adoption of AMA Guides Sixth Edition (Rondinelli 2009). In a recent study, three US states that adopted the Sixth Edition were compared to two US states that continued to use the Fifth Edition; results showed substantial reductions (i.e., 25–32 %) in the average impairment ratings with the newer version (Moss et al. 2012).

Functional Capacity Evaluation (FCE) is a difficult and dynamic technical process applied within medical and legal settings to evaluate an individual's functional physical ability as part of the RTW process. Physical job and workplace demands are compared with the individual's limitations and capabilities during the evaluation and the FCE is considered a disability determination tool. Currently, correlations between a sustainable and safe RTW and validity, efficiency, and reliability require additional work before an FCE is considered a useful tool in RTW decisions (Pransky and Dempsey 2004). Gross and Battié (2004, 2005) argued that performance on an FCE is influenced not only by physical factors but also by disability perceptions, pain intensity, and beliefs. Adaptations of the ICF have emerged that integrate performing FCE for individuals with chronic conditions (Chen 2007; Wittink 2005).

Escorpizo and colleagues (Escorpizo, et al. 2011a, b, 2015) have taken the first steps in integrating the ICF model with vocational rehabilitation. They conducted a systematic review of questionnaires used in vocational rehabilitation and found that no questionnaire or measure yet exists that captures the multiple, essential functional domains within the RTW process. Please see the chapter by Escorpizo et al. in this Handbook for more details.

Key questions assisting in bridging the chasm between impairment and work disability are not often asked in clinical assessments. These questions include: (1) to what degree does the impairment actually affect current or future work capacity? (2) is there a significant risk of deterioration after RTW?, and (3) can modification or accommodation attenuate or eliminate disability or impairment? As illustrated by these questions, in the impairment and disability determination fields, theory, research, and practice still tend to continue on divergent paths.

On a positive note, impairment evaluation procedures, largely driven by the methodology of the AMA Guides, have expanded within the scientist-practitioner inquiry model. There is movement towards recognizing standardization, norms, reliability, and validity factors in evaluation, and recognition of the importance of evidentiary support has advanced. However, this "radical" shift in adopting the ICF biopsychosocial model has resulted in criticism regarding methods used in attempting to achieve higher levels of intra- and inter-rater reliability and internal consistency (Bellamy and Campbell 2009). Also, current disability determination approaches, despite the proliferation of quantitative studies on predictors of disability with emerging actuarial approaches to RTW prediction (especially for musculoskeletal disorders), have not yet yielded statistical formulae validated for various clinical, case management and legal applications.

1.4.4 Multiple Definitions of Occupational Disability

The relationship determination involving impairment, disability, and RTW in both research and practice is adversely affected by the lack of a single, universally accepted concept and by the multiple operational definitions of disability (Schultz 2003, 2009). For the latter, definitions include loss of earning capacity, duration of disability (or absence from work), employability, return to pre-injury versus new employment, impaired work performance, or perception of disability by self or others. This diversity in research complicates both predictive and outcome studies of disability and limits the generalizability of findings, the development of integrative models, and knowledge mobilization.

In clinical applications, occupational disability is often confused with general disability; the latter is defined as the inability to meet personal, daily living, social and recreational, and work demands. The AMA Guides (1993; Cocchiarella and Andersson 2000) clearly caution against the indiscriminate use of impairment ratings as work disability ratings:

> Impairment percentages estimate the extent of the impairment on whole person functioning and account for basic activities of daily living, not including work. The complexity of work activities requires individual analyses. Impairment assessment is a necessary first step for determining disability (Cocchiarella and Andersson 2000 p. 13).

Notably, since impairment and disability are often erroneously equated in law and in practice, differences between the AMA Guides' derived general impairment ratings and the original intent as a proxy or a major contributor to work disability exist. This disparity is seen in the absence of clear empirically supported evidence of how the two outcomes are related. Thus, predominately in clinical versus forensic disability determination settings, assessed individuals are instead referred to as "disabled" or "totally disabled" in the absence of evidence of the impact of impairment on work ability, general performance, and specific workplace contextual characteristics.

1.5 Mediating Factors Between Impairment and Occupational Disability

The literature converges in asserting a multidimensional relationship between impairment and occupational disability. Mediating this relationship are two emerging factors: (1) individual resources including residual work capacity, coping and motivation, and (2) characteristics of the workplace and/or job to which an individual is expected to return (Schultz 2003, 2009).

1.5.1 Individual Resources

Individual resources identified in research on the prediction of disability include factors such as sociodemographic, emotional, attitudes and beliefs, motivation, and general and specific health (e.g., Krause et al. 2001; White et al. 2013). When predicting disability, biopsychosocial models of disability particularly emphasize cognitive roles, such as perception, beliefs and expectations, and coping roles, including catastrophizing and passive coping (Crook et al. 2002; Dunn and Dougherty 2005; Elliott et al. 2005; Linton 2000; Schultz et al. 2002, 2004; Schultz and Stewart 2008; Sullivan 1998; Turk 2002; White et al. 2013; Wheeler et al. 2013). Individual coping factors, beliefs and perceptions, however, although empirically supported, especially in musculoskeletal pain studies, are not routinely examined in medico-legal determinations of disability (Schultz 2008).

Coping factors and motivation are postulated to mediate impairment and disability (Roessler 1989; Schultz and Brady 2003). According to the instrumental theory of motivation: "action results when an outcome, i.e. returning to work, is perceived as both probable and beneficial to the individual" (Roessler 1988 p. 14). Further, motivation can be conceptualized as a function of expectations, understood as a person's chances of achieving a desirable outcome and the value of the outcome divided by the costs of performing such action (McDaniels 1976).

In application to occupational disability, within forensic psychology research and practice, motivation and coping factors are often equated to suboptimal effort and equivalent to symptom invalidity, malingering, secondary gain, and symptom magnification (Schultz 2009). A person's motivation to RTW with residual impairment or symptoms may be a function of their expectations of recovery and the value of the work balanced by the personal costs associated with coping with impairment (Schultz et al. 2004). Coping factors, outcomes, and processes are considered significant disability predictors (e.g., Elliot et al. 2005; Johnson et al. 2006; Salathé et al. in press; Schultz and Stewart 2008; Snekkevik et al. 2014).

The concept of "secondary gain" in disability determination is commonly misinterpreted (Schultz et al. 2001) and has detrimentally impacted the development of other relevant and motivation constructs involving disability gains and losses—including constructs with better potential to clarify the relationship between impairment and disability (Dersh et al. 2005). Recent research has clarified that although secondary gains may perpetuate disability, the losses (e.g., social factors, financial stability or self-esteem) are often more powerful factors. Please see the chapter by Choi et al. in this Handbook.

Augmenting motivational factors in determining disability while considering its complexity, temporal dimensions, and multidimensionality is recommended (Schultz 2009; Worzer et al. 2009). Lack of motivation to RTW as a predictor of disability has received strong evidentiary support in research (e.g., White et al. 2013) and therefore this complex and multidimensional concept requires further exploration.

1.5.2 Work and Workplace-Related Factors

In addition to individual resources, work and workplace-related characteristics also mediate between impairment and disability. At the individual task level, physical job and psychosocial job characteristics and, at the organizational level, meso-level employer factors predictive of duration of disability have been widely investigated. Physical job characteristics linked with prolonged disability include heavy physical work, repetitive or continuous strain, musculoskeletal strain, physical de-conditioning, uncomfortable working positions, crouching, bending, noise exposure, twisting or fixed positions, more daily hours of physical labor, construction work, interaction of physical demands with physical limitations, and interaction of physical demands and place of residence (Heymans et al. 2010; Krause, et al. 2001; Leeuw et al. 2007). Also linked with chronicity are pain behaviors including magnification of physical symptoms, seeking validation from the medical system, guarding, limping, and bracing (Dersh et al. 2005; Prkachin et al. 2007; Schultz et al. 2002).

Related psychosocial job characteristics include exposure to piecework, time pressure, shift work, heavy physical labor, driving, high-risk work, high job strain or stress, low job control, high psychological job demands, monotonous work, long work hours, low social support, low job seniority, and/or job dissatisfaction (e.g., Costa-Black et al. 2010; Elfering et al. 2008; Krause, et al. 2001; Melloh et al. 2011; Shaw et al. 2011; Steenstra et al. 2005; White et al. 2013).

At the organizational level, the following factors have links to shortened duration of disability: people-oriented culture, a proactive RTW program, positive safety climate, ergonomic job design practices (Amick III et al. 2000; Hunt and Habeck 1993), employment by a public employer (Infante-Rivard and Lortie 1996), and early intervention activities, such as providing case management, coordinating the primary healthcare provider with the compensation, accommodation assessment, modification of work and supporting exercise, return to pre-injury activities, providing phone call and related support, motivational interviewing, and cognitive behavioral interventions (Schultz et al. 2015).

Societal level, social policy, and macroeconomic contextual factors affecting the duration of disability have also been investigated producing disparate results. Litigation, complexity of the compensation system, and dismissal during sick leave have led to prolonged disability whereas a high number of job benefits tended to shorten disability (Krause, et al. 2001; Nguyen et al. 2011; Wheeler et al. 2013).

1.6 Knowledge Mobilization: From Theory to Research and from Research to Practice

1.6.1 Medico-Legal Contexts

Knowledge mobilization of researched predictors of disability to the practice of disability determination in medico-legal contexts is in an early stage. A number of factors influence this situation: newly developed models of disability prediction have narrow applications (e.g., claimants with subacute back injury in a non-litigious compensation system) that should not be generalized automatically to other systems (Schultz and Stewart 2008); validity evaluation, especially specificity issues, for applications other than those recommended by research (Linton et al. 2005; Schultz and Gatchel 2005; Waddell et al. 2003); limited application of actuarial prediction paradigms, often only to musculoskeletal pain research (Linton et al. 2005; Schultz et al. 2002; Waddell et al. 2003); methodological issues in disability prediction including an inadequate scope and balance of variables that currently still underestimates stakeholders like family, employer, and job market factors; a limited range of new, more efficient and psychometrically tested assessment tools that reflect current integrative models (Schultz and Stewart 2008); a paucity of integrative, empirically supported models of disability prediction for both medico-legal and clinical (prevention, case management, and rehabilitation) applications; and the prevalence of outdated biomedical and forensic models of disability determination in compensation and legal settings (Knauf and Schultz 2015; Schultz 2005; Schultz and Chlebak 2014). Before any compensation-related analyses are completed, decisions on the severity of occupational disability must be made. Yet, such decisions, whether made by a vocational expert, a judge, jury, or compensation specialist, are extremely complex and require bridging impairment and disability via contextual, individual, and work-related factors.

However, development within this field is occurring. The biopsychosocial model is expected to “merge” with a modified “socialized” forensic model within the next decade; this prediction is based on observable changes with the forensic model (Knauf and Schultz 2015; Schultz et al 2007; Schultz, et al. 2011a, b). Linton et al. (2005) and Shaw (2015) have also identified that collaboration with disability stakeholders maximizes knowledge transfer and RTW outcomes. In this vein, lack of family support as a predictor of disability now has strong research evidentiary support (White et al. 2013), encouraging an enhanced understanding of how families can influence RTW outcomes.

In addition, complex personal cognitive constructs, such as expectations of RTW, identified as powerful predictors of disability (Cole et al. 2002; Schultz et al. 2004; Turner 2006) have been unpacked and a perception of uncertainty with respect to RTW has emerged as being of critical significance in understanding how expectations of RTW could be modified to enhance RTW outcomes (Knauf and Schultz 2015; Stewart et al. 2012). Likewise, perception of injustice or unfairness has been linked to lowered disability outcomes (Adams et al. 2007; Sullivan 2015; Sullivan and Adams 2010; Sullivan et al. 2005; Sullivan et al. 2006), thus providing yet another opportunity to enhance existing RTW predictive models and offer a modifiable intervention target.

1.6.2 Clinical and Compensation System Contexts

The relationship between impairment and occupational disability, at research and clinical levels, is at the core of identifying individuals at risk for chronic disability, the need for early intervention, secondary prevention, and legal determination of entitlement and disability benefits. Multiple issues arise when transferring knowledge from theoretical models to research and from research to clinical and administrative practice. Questions typically cluster around two areas: (1) is the knowledge ready to be transferred (mobilized)? and (2) is the practice ready for the knowledge?

Current problems associated with knowledge mobilization in impairment and occupational disability arise from the difficulty of integrating research data collected in diverse clinical conditions. Studies on impairment and work disability span physical, pain-related, and psychosocial conditions and follow different conceptual models, methodologies, and questions.

Presently, knowledge mobilization regarding the relationship between impairment and disability has a narrow scope; e.g., specific conditions (with musculoskeletal pain receiving most of the research attention), stage of disability (Krause, et al. 2001), contexts, such as primary health care, rehabilitation settings, and/or compensation (workers' compensation or insurance system), systems, company characteristics, regions, or sociodemographic profile of individuals, and applications including risk identification, early intervention, and disability determination for medico-legal purposes.

Application to situations where the relationship between impairment and disability has been validated is another limitation; this difficulty is due to generalizability problems with the studies. For example, a predictive model of work disability for workers with low back pain in the subacute stage in the Canadian province of British Columbia may not easily translate to chronic musculoskeletal disability determination practices in the state of Ohio, as the original model was not validated for such an application.

1.6.3 Other Considerations and Barriers

As discussed, conceptual convergence exists with some of the main tenets in key models of disability. However, with the diversity of specific operational definitions, including the terms impairment and disability, it is difficult to integrate the research in the literature and develop empirically supported models of the relationship between impairment and disability. In addition, some of the critical explanatory concepts related to mediation of the relationship between impairment and disability are ill defined, substituted by other concepts, or not defined.

The inter-related concepts of motivation and coping remain poorly understood, mainly due to construct validity issues. Yet, it remains critically important to understand why some individuals with severe impairments continue to work and others with medically mild impairments become totally disabled. Particularly, the concept of work motivation, derived from organizational psychology (Kanfer 1990; Latham and Pinder, 2005; Locke 1999; Pinder 1984, 1998, 2000) and social learning theory (Bandura 1986; McDaniel 1976; Roessler 1988), has not yet been adequately conceptualized and operationalized in rehabilitation studies likely due to insufficient outreach to social psychology (Siegert and Taylor 2004). However, despite these construct issues, new measurement tools for RTW self-efficacy and motivation have been advanced (Brouwer et al. 2011; De Rijk et al. 2009).

Studies on suboptimal motivation (e.g., classic studies by Fishbain 2003) are largely atheoretical and contribute to improving impairment assessment in medico-legal settings, but not to learning why some people are motivated to cope with impairment and RTW while others have difficulties. This represents a critical knowledge challenge for designing effective RTW programs.

In addition, other complementary contextual factors mediating between impairment and disability are workplace and job-related factors. These factors, although gaining in prominence in disability research (White et al. 2013), still have received less research attention when compared to individual factors. Mobilizing knowledge into practice for the workplace is limited in scope and is focused primarily on helpful versus hindering factors in the RTW process. Workplace organizational factors most clearly associated with occupational stress and musculoskeletal disability include beliefs, fears, and expectations around the RTW process and the work itself, increased physical and psychological demands, job strain, time pressures, perception of job threat, low autonomy, inability to modify work, monotonous work, lack of job satisfaction, and lack of workplace support (from management and peers, including practical support) (Costa-Black et al. 2010; Heymans et al. 2010; Schultz et al. 2002; Shaw et al. 2011; Soucy et al. 2006; White et al. 2013). In addition, job accommodation and transitional work programs have been linked to improved RTW outcomes (Crook et al. 2002; Franche et al. 2005; Krause et al. 2001; Krause, et al. 2001; Kwan 2013; Kwan and Schultz 2014; Kwan and Schultz 2015; Stewart et al. 2012) but not necessarily incorporated into integrated models of disability prediction. It is, however, unclear how various impairments and workplace/job characteristics interact with individual characteristics in contributing to and maintaining work disability.

Moreover, despite advances made in the measurement of impairment, the assessment of pain-related and psychological impairment continues to lag behind the measurement of physical impairment. The need for the application of an interdisciplinary model of assessment complicates measurement of these conditions in research and practice. Importantly, the most influential guide to determination of medical impairment, the AMA Guides Sixth Edition (Rondinelli 2009), admits that research is limited on the reproducibility and validity of the Guides. Only anecdotal reports indicate that adoption of the Guides results in a more standardized impairment process. As relevant research becomes available, subsequent editions of the Guides will incorporate these evidence-based studies to improve the Guides' reliability and validity (Rondinelli and Eskay-Auerbach 2009).

Notably, in the absence of reliability data, studies on validity are unlikely to be contributory. Last, but not least, clinical and legal/administrative practices in the translation of impairment into occupational disability also face barriers and limitations in using new knowledge. A health care or compensation system needs awareness regarding whether the model of determination of the disability of interest (e.g., a disability risk identification system) has been validated in a similar setting and a similar application. If the answer is yes, further potential barriers emerge. The new model may be inconsistent with current practices, particularly if these practices are based on a biomedical or forensic concept of impairment and disability (Knauf and Schultz 2015; Schultz et al. 2000, 2007). Recognition of the importance and systematic collection of both psychosocial and workplace data may prove too foreign to such systems. New practices and information collected in the process must meet legal standards for admissibility of evidence accepted in a given disability administration system.

Data collection issues inherent in administrative databases involved in disability determination systems usually do not meet requirements of completeness, standardization, reliability, and validity (Schultz et al. 2002) and effectively hamper development of risk identification and early intervention systems in practice. Staff training to collect data in a standardized fashion and a need for periodic recalibration of skills must be recognized by the administration of the system (Schultz et al. 2002). Also, the need to change and update the system as new knowledge becomes available can be cumbersome and costly to the system.

1.7 Conclusions

In the context of epidemiological trends demonstrating an increased or increasing incidence and/or duration of musculoskeletal, pain-related, psychological and neuropsychological disabilities, the biomedical model of disability is expected to shift to a biopsychosocial model. The determination of disability from impairment becomes, under such a model, an interdisciplinary or perhaps a transdisciplinary task. Evaluating the relationship between impairment and disability continues to be critical in identifying individuals at risk for disability, early intervention, disability prevention, and disability determination in both clinical and legal contexts.

The relationship between impairment, work disability, and RTW is not linear but multidimensional and interactive. The key factors mediating this relationship are related to the individual and the workplace context in which impairment occurs. An improved understanding of the relationships among individual factors critical for prediction of disability, including sociodemographic factors, physical, functional, and health factors, and psychosocial factors, such as emotional stability, beliefs, perceptions, expectations, coping, and motivation using a cognitive–behavioral conceptualization, with workplace and job factors, as well as with the limitations posed by impairment, is critical in both research and practice applications.

Workplace and job factors have not been researched as thoroughly as individual factors, and have only recently been incorporated into integrative predictive models. Workplace factors can be seen from a meso-level perspective of workplace organizational characteristics such as company climate, culture or job design, and RTW practices. At the same time, specific job characteristics usually conceptualized using a control-demand model (Karasek and Theorell 1990) and demand-control-support model (Johnson and Hall 1998) were identified as linked to RTW and prevalence and/or duration of occupational disability (e.g., Janssen et al. 2003; White et al. 2013).

Gradual replacement of judgment-based decision-making models of translation of impairment into disability and identification of individuals at risk for disability, by actuarial predictive formulae and algorithms for decision-making, continues to be an aspirational goal. At this time however, numerous conceptual, methodological, and system-based barriers impede direct transfer of knowledge in the area.

Specifically, the multiplicity of research studies on various clinical conditions, with discrepancies in conceptual models, operational definitions of impairment and disability, methodological approaches, applications, and outcomes, constitutes the most significant barriers. Despite major advancements in the field, existing research-based models of prediction of work disability are still not easily transferable to practice. Difficulties include generalizability problems secondary to different sociodemographic and clinical sample characteristics and stages of disability, regional and system-based differences, disparate outcome definitions and measures, different methodological designs, intended applications of models, and specificity and sensitivity of the prediction formulae. In addition, disability prediction studies lack an overarching conceptual model despite the preference of biopsychosocial over forensic or biomedical approaches and the expansion of the ICF model. An actual impairment measurement, despite attempts at the standardization of an evaluative approach by the AMA Guides for the Evaluation of Permanent Impairment, continues to require reliability and validity research. With the absence of reliability in impairment evaluation, any need for evidence of validity becomes a moot point.

The issue of motivation, particularly measurement of suboptimal motivation, is implicated in the evaluation of both impairment and disability. Current attempts at measuring motivation are largely atheoretical. In disability prediction studies, the construct of motivation was replaced by the construct of coping. Yet, social learning theory of work motivation (Bandura 1986; McDaniel 1976; Roessler 1989) appears to have gained research support. More recently, emotional aspects of motivation have been emphasized (Seo et al. 2009), together with the exploration of stages of motivation (Bedny and Karwowski 2007). A person's motivation to RTW may be a function of expectations of recovery (beliefs and/or perceptions) with the value of work balanced by personal costs, including emotions associated with coping with impairment. To better understand the elusive social cognition-related aspects of the construct of RTW motivation, Siegert and Taylor (2004) proposed a closer research collaboration between social psychology and rehabilitation sciences.

A number of barriers exist: system-based challenges inherent in medico-legal contexts related to determining disability from impairment (e.g., workers' compensation or long-term disability insurance systems), systemic preferences for biomedical and forensic models of disability, and methodological problems associated with the use, relevance, standardization, reliability, and validity of administrative databases involved in the process of risk for disability and work disability identification. Despite these challenges, the public and private systems mandated with identification, management, prevention, and compensation for disability could still benefit from current evidentiary support to inform and guide their best practices and improve both clinical and economic disability outcomes.

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Current Conceptual Models of Return to Work

2

Matthew T. Knauf and Izabela Z. Schultz

2.1 Introduction

Over two-thirds of poor-health retirement, long-term absence due to sickness, and disability benefits arise from "common health problems"—i.e., mild/moderate musculoskeletal and cardiorespiratory symptoms and mental health (Waddell and Aylward 2005, 2010). Within the workplace, musculoskeletal pain disorders—which involve injury disorders of muscles, ligaments, tendons, joints, cartilage, and/or spinal disks—represent the most costly, disabling, prevalent, and commonly researched conditions (Schultz et al. 2007; U.S. Department of Labor and Bureau of Labor Statistics 2010). Despite the urgency and contributions from many researchers and clinicians in various fields (e.g., occupational medicine, nursing, rehabilitation medicine, physical therapy, exercise physiology, physical and occupational therapy, ergonomics, engineering, psychology, vocational counseling, economics, and public health), a single theoretical framework unifying these fields remains missing. Comprehensive reviews of existing models were recently published (e.g., Kirsh et al. 2010; Schultz et al. 2007); however, only modest changes have been proposed since then.

2.2 Definitions

Although much research has centered on return to work (RTW) in the field of occupational disability, a clear RTW definition remains elusive (Young et al. 2005). A number of investigators have tried to identify a RTW definition, but differences still remain in how researchers understand and operationalize the terms "disability" and "RTW." Schultz et al. (2007) observed that while occupational or work disability has been operationally defined as "time off of work, reduced productivity, or working with functional limitations as a result (outcome), of either traumatic or nontraumatic clinical conditions, the term 'return to work' is utilized as both a process and outcome measure" (p. 329).

Looking more closely at defining RTW, Krause and colleagues (Krause et al. 2001a, b) further proposed that RTW could be a: (1) process, such as graduated return to work; (2) working status, considered a final, measurable outcome related to disability, and its nuances

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including return to pre-injury employer and/or job and the use of accommodations; and (3) a variety of vocational outcome definitions, including length of work inability. Length itself can be measured through methods including cumulative length, categorical (i.e., Yes or No for RTW status), and days lost from work starting from injury date. In sum, based on the stakeholder, wide variations of RTW definitions exist in research and practice, limiting generalizability of research outcomes and knowledge transfer to practice (Franche and Krause 2002; Krause et al. 2001b; Schultz et al. 2007; Stowell and McGeary 2005; Young et al. 2005).

2.3 Historical Perspectives

Current conceptualization of RTW models arise from a few significant sources, including, and not surprisingly, the definition of RTW. Other significant influences include pain disability and health perspectives over the course of history (Schultz et al. 2007). Classic perspectives include Hippocrates' influential ideas on the mind-body connection (Noy 2002), Brody's proposal of a hierarchy systems approach to health that emphasizes interrelatedness (Brody 1973), and Melzack's contribution of the *neuromatrix model of pain*, which accounts for genetic factors, individual responses to the environment, and biological concomitants (Imrie 2004).

Three major theoretical paradigms—biomedical, social construction, and biopsychosocial—form the historical roots of RTW models (Bickenbach et al. 1999; Fine and Asch 1988; Lutz and Bowers 2007; Meyerson 1988; Olkin and Pledger 2003; Smart 2001; Tate and Pledger 2003; Verbrugge and Jette 1994). Within the biomedical approach, disability is produced by a medical condition that is an identified, observable deviation from biomedical norms of function or structure. Disability is viewed as a personal problem that requires medical treatment. Factors such as context and environment are not considered (Bickenbach et al. 1999; Boorse 1975, 1977; Reed et al. 2008; Schultz et al. 2000, 2007; Smart 2001; WHO 2001). Notably, psychiatric diagnostic manuals (i.e., the *Diagnostic and Statistical Manual of Mental Disorders-IV-TR* [*DSM-IV-TR*; American Psychiatric Association [APA] 2000] or the *Diagnostic and Statistical Manual of Mental Disorders-5* [*DSM-5*; APA 2013]) govern and inform the classification of mental disorders and psychological injuries. Under the biomedical model, psychopharmacologic treatment is primarily used to treat mental disorders (Comer et al. 2010; Mojtabai and Olfson 2008, 2011).

Within the social construction paradigm, disability is viewed as complex combination of activities, relationships, individual attributes, and conditions arising mainly from the social environment of the individual (Bickenbach et al. 1999; DePoy and Gilson 2004; Tate and Pledger 2003; Olkin and Pledger 2003). Disability depends on a societal response in a given context; thus, with an appropriate response, disability would not exist (Smart 2001; Smart and Smart 2007).

The biopsychosocial approach is informed by both social and the biomedical paradigms. Engel (1997) proposed that micro-(interactional), meso-(organizational or community), and macro-(structural) ecological and structural levels predict social and clinical outcomes (Tate and Pledger 2003). Evolvement of this alternative paradigm furthered the conceptualization of disability as multifactorial. This development includes work by Fine and Asch (1988) and Meyerson (1988) who contributed environmental and social components and research by Schultz et al. (2000) and Tate and Pledger (2003), highlighting the psychological and psychosocial elements. Verbrugge and Jette (1994) postulated an interactive disability model where disability is considered situational. Social and environmental factors alter functional limitations. Other important contributions include the model proposed by the Institute of Medicine (Pope and Tarlov 1991) and the International Classification of Functioning, Disability, and Handicaps model (World Health Organization (WHO) [WHO] 1980).

These three major paradigms have collectively given rise to five major groupings within the disability field, informing RTW models: (1) biomedical and forensic, (2) psychosocial, (3) ecological/case management and economic, (4) ergonomic, and (5) biopsychosocial (Schultz et al. 2007a, b). These models are characterized by distinctive constructs, research traditions, main tenets, values, practice implications, weight placed on the individual with the disability, and the environment and its interaction (Schultz 2008; Schultz and Stewart 2008; Smart 2001). Please see Table 2.1 for a comparison of the underlying constructs and research traditions with these five major model groupings.

2.3.1 Biomedical and Forensic Models

Currently, the biomedical model remains the most predominant framework for many researchers and professionals in clinical sciences and healthcare (Leibowitz 1991; Schultz et al. 2000; Turk 1996). However, its prominence and usage are gradually losing emphasis, primarily because this model is no longer viewed as a complete or accurate method of evaluation due to the recognition of many other factors that impact disability (e.g., psychosocial factors, societal influences) (Cocchiarella et al. 2000; Cocchiarella and Andersson 2000; Hunt et al. 2002; Kelly and

Table 2.1 Comparison of underlying constructs and research tradition in conceptual RTW models

Current model	Former model name	Research tradition	System vs. individual focus	Key determinants of RTW
Biomedical	Same	Medicine	Individual	Medical impairment
Forensic	Insurance	Forensic psychology	Individual; evolving toward recognition of system factors	Secondary gain; evolving into interaction among primary, secondary, and tertiary gains and losses
Psychosocial	Psychiatric	Health and rehabilitation psychology	Individual; evolving toward integration of systems based focus	Psychosocial factors: beliefs, perceptions, and expectations re RTW
Ecological/case management	Labor relations	Sociology, anthropology Social, organizational, occupational health psychology; occupational health/therapy	System/system-individual interaction	Proactive system-based RTW policies and practices
Economic	N/A	Health economics	System	Economic incentives built into the macrosystem
Ergonomic	*N/A*	*Kinesiology, psychology, engineering, occupational and physical therapy, medicine*	*Individual/system interaction*	*Adaptation after injury*
Biopsychosocial	Same	Interdisciplinary/transdisciplinary	System and individual interaction	The interaction among medical, psychosocial, and system-based factors in RTW

Adapted from Schultz et al. 2007

Additions are italicized

Field 1994; Peterson and Elliott 2008; Robinson et al. 2004; Schultz et al. 2000; Stowell and McGeary 2005). Utility, however, can be found in research contributions related to understanding disease processes and early initiatives around enhancing quality of life, care, and survival. Identification of health outcomes constitutes the medical model's another contribution. Also, information is often gathered in a quantitative and actuarial manner and has classification potential (Peterson and Elliott 2008; Peterson and Threats in press). Medical-legal applications have also benefitted from this model historically (Schultz and Chlebak 2014).

In parallel, the forensic model (formerly known as the "insurance model" [Schultz et al. 2007]) reduced the importance of scientifically based information on impairment, focusing

Table 2.2 Comparison of the biomedical model to the forensic model

	Biomedical model	Forensic model
Main tenets	• Pathological illness	• Anticipation of secondary gain can lead to dishonesty about symptomatology
	• Symptoms and disability are directly proportionate to physical pathology • Mind and body are separate • Physicians in control of diagnosis and treatment direction	• Objective proof of impairment and disability must be provided • It is paramount to clearly discriminate between "honest" and "dishonest" clients • Interactions among primary, secondary, and tertiary gains and losses should be considered
Underlying values	• Scientific evidence and objectivity	• Scientific truth • Protection of the system from abuse and dishonesty
		• Cost effectiveness
Implications for diagnosis	• Focus on uncovering organic pathology • Sequential diagnostic approach	• Thorough and exhaustive assessment using special forensic methods aimed at detection of inconsistencies and deception
		• Utilization of interdisciplinary model
		• Individuals showing inconsistencies in testing identified as "illegitimate," "malingerers," "symptom magnifiers," and/or motivated by secondary gain
		• Adversarial service climate
Implications for treatment	• Cure orientated versus coping orientated	• "Honest" clients may receive a wide array of treatment options
	• Need to relate physical treatment to underlying pathology	• "Dishonest" clients receive no treatment
	• Focus on physical treatment modalities	
Implications for compensation	• Compensation for impairments with clearly identified medical causes • Lack of specific built-in financial incentives for coping	• Compensation for "honest" clients only • Appears an attractive option due to simplicity • Long-term costs due to chronicity in incorrectly identified clients • Multiple systemic safeguards necessary to detect malingering may cause service inefficiencies

Adapted from Schultz et al. 2007

instead on detecting individuals who exaggerate symptoms and present malingering behaviors. Case management and rationing treatment and benefits have become paramount (Bernacki and Tsai 2003; Pergola et al. 1999; Schultz et al. 2007; Shaw et al. 2001; Tsai et al. 1999). Within the context of occupational disability, biomedical and forensic models have evolved; thus, some determinants of RTW will be more evidence—supported than others.

The biomedical model primary involves two individuals, the client (e.g., the injured or disabled worker) and the treating physician; the decision to RTW is primarily based on the physician's evaluation, treatment, and recommendations involving the injury (Pransky et al. 2004; Schultz et al. 2000). The forensic model mimics the biopsychosocial approach (Hadjistavropoulos and Bieling 2001; Sherman and Ohrback 2006); it integrates cognitions and motivations while attempting to explain the interactions between the injured worker and the disability system.

The biomedical model relies heavily on objective findings, whereas the forensic model attempts to identify the motivations that may influence the RTW decision. A commonality between the two models is a reliance on an individual focus of the client (Schultz et al.2007). While considered a strength, it also serves as a limitation: these models do not apply well to individuals with "biopsychosocial" conditions, such as chronic pain. Refer to Table 2.2 for a summary of the features of these models.

2.3.2 Psychosocial Models

Evolving from the traditional psychiatric perspective of disability with a focus on psychopathology, the psychosocial model considers a broader psychosocial adaptation perspective (Schultz et al. 2007). RTW is viewed as a behavior, and occupational disability is viewed as a wide-ranging set of conditions created by a client's social environment and other societal institutions versus an individual attribute (Baril and Berthelette 2000; Olkin and Pledger 2003; Schultz and Gatchel 2005; Tate and Pledger 2003).

Expectations of outcome and efficacy in predicting an individual's ability to achieve a desirable outcome have started to gain empirical research support (Cole et al. 2002; Sandstrom and Esbjornsson 1986; Schultz et al. 2004; Turner et al. 2006), implying that Bandura's social learning theory (Bandura 1977; 1986) may still hold significant conceptual promise with this model. Some of the mechanisms underlying disability focus on beliefs, expectations, perceptions, locus of control, self-efficacy, and individual coping (Burton et al. 1995; Haldorsen et al. 1998; Jensen et al. 1999; Linton 2000; Turk and Gatchel 2000). Recent developments include an individual's cognitive-behavioral factors and psychosocial factors of systems such as workplaces, unions, healthcare, and disability insurers (Franche et al. 2005; Schultz et al. 2007; Stowell and McGeary 2005; Sullivan et al. 2005). Refer to Table 2.3 for a summary of this model's features.

2.3.3 Ecological/Case Management and Economic Models

The stakeholder's perspective forms the primary focus of these models. Decisions and determinants of RTW are assessed with a complex intersystem interaction between workplaces, disability payers, insurance carriers, and healthcare. Possessing strengths in complexity and multidimensionality, these models require improved construct validation and further development to understand the key contributions of its system components and their interactions (Schultz et al. 2007).

Foundational differences exist in these models. The ecological/case management model is founded on a whole host of disciplines including anthropology, health psychology, industrial/organizational psychology, nursing, occupational health and therapy, sociology, and social work. The economic model is tightly founded on the field of economics (Schultz et al. 2007). In addition, the ecological/case management model is focused on the role of systems; Bronfenbrenner's systems theory (1979), involving interactions

Table 2.3 Summary of the psychosocial model

	Psychosocial model
Main tenets	• Psychosocial factors play predominant role in disability and readiness to RTW
	• Psychosocial factors are both individual related and system related
	• Perceptions, beliefs, and expectations of recovery and disability, self-efficacy, and ways of coping are more important than objective factors in disability formation
	• Motivational factors mediate between impairment and disability
Underlying values	• Scientific evidence
	• Comprehension of disability drivers
Implications for diagnosis	• Psychosocial factors must be assessed and identified at any stage of disability
	• Beliefs about disability need to be investigated
	• Stage of readiness for RTW including self-efficacy and decisional balance should be identified
	• Psychological diagnosis is of secondary importance
Implications for treatment	• Modifiable psychosocial factors must be targeted in treatment on a priority basis
	• Psychological treatment of choice: cognitive-behavioral interventions
	• Prevention targeting psychosocial factors can be undertaken in the interdisciplinary intervention context, not only in psychological therapy context
Implications for compensation	• Psychological factors must be accounted for in treatment even if they are uncompensable
	• Expedited RTW, possible increase in benefits

Adapted from Schultz et al. 2007

between *microsystems*, *mesosystems*, and *macrosystems*, heavily influences this model (Baril and Berthelette 2000; Friesen et al. 2001; Krause and Ragland 1994; Loisel et al. 2001a, b; 2005).

Loisel and colleagues (Loisel et al. 2001, 2005) present the most up-to-date ecological/case management model of RTW; please see Fig. 2.1 for a conceptual model of RTW and secondary prevention.

This model emphasizes that the most important stakeholders are the workplace, health-care system, and the compensation system; the actions and attitudes of these stakeholders are crucial in conceptualizing RTW. The economic model focuses mainly on macrosystem factors (Baldwin and Johnson 1995; 1996; Butler et al. 1995; Chirikos and Nestel 1984; Johnson and Baldwin 1993). Refer to Table 2.4 for a summary of the features.

2.3.4 Ergonomic Models

The ergonomic perspective of disability focuses on understanding the interactions among humans and other system elements through application of theoretical principles and methods to optimize human well-being (IEA n.d.). While the field of ergonomics covers three distinct disciplines—physical, cognitive, and organizational—within the context of disability, this section will focus on the physical and cognitive aspects. Refer to Table 2.5 for a summary of the major features of this model.

Traditionally, this model focuses on both interactions between individual and system elements and in injury prevention (Leyshon and Shaw 2008). From this viewpoint, whether or not an individual is able to RTW is an outcome based on adaptations made in the workplace (e.g., job tasks, working hours) (Stewart et al. 2012). Often, the domain of ergonomics is split: *macro-ergonomics* and *micro-ergonomics*.

Macro-ergonomics deals with the large scale, encompasses a more global approach, and addresses policies, attitudes, and processes (Hendrick 2003; Leyshon and Shaw 2008). Applications are typically at both company and governmental levels. On the other hand, micro-ergonomics encapsulates what the typical public views as ergonomics, i.e., mainly worker-specific interventions and/or the worker and machine interface. Micro-ergonomics can therefore be applied to the worker or a machine. A common

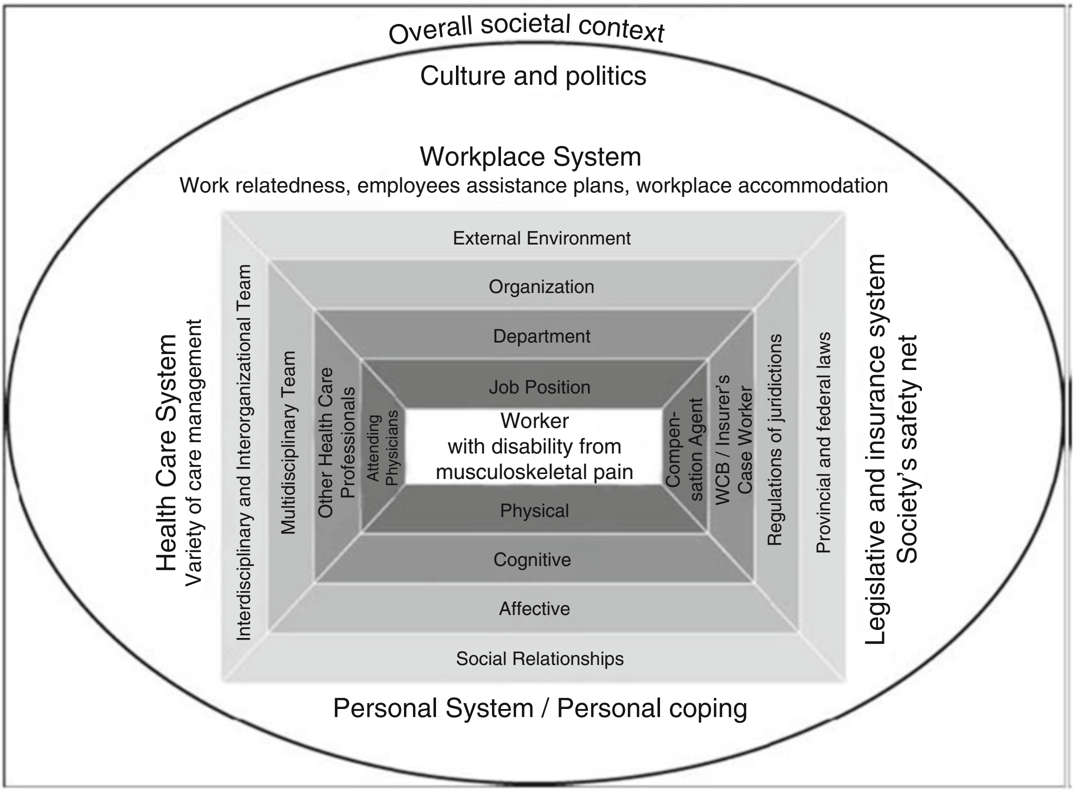

Fig. 2.1 The arena in occupational disability prevention (Loisel et al. 2005)

example is an adapted computer keyboard or an ergonomic desk chair, both designed to reduce and/or prevent injury (Leyshon and Shaw 2008). Three main disciplines in ergonomics have emerged: physical, cognitive, and organizational; ergonomists often describe themselves in one of the three categories.

The ergonomic model of RTW is based on the interaction between the individual and the system. More recent contributions have moved away from the traditional ergonomic approach to *participatory ergonomics*. This approach involves active participation and a strong commitment from both the employee and employer in order to identify workplace risk factors and interventions to prevent long-term disability (Anema et al. 2003).

Ergonomic interventions have been increasingly found useful in preventing musculoskeletal disorders among workers and reducing injury rates (Anema et al. 2003, 2004, 2007; De Jong and Vink 2000; Droeze and Johnson 2005; Halpern and Dawson 1997; Haslam 2002; Hendrick 2003; Jack 2005; Ketola et al. 2002; Koningsveld et al. 2005; Kuorinka et al. 1994; Leyshon and Shaw 2008; Marcal and Mazzoni 1988; McCluskey et al. 2006; Pohjonen et al. 1998; Vink et al. 1995, 1997; Vedder and Carey 2005; Wickstrom et al. 1993; Wilson 1995). The use of ergonomic interventions in long-term disability prevention or RTW outcomes has not been as prevalent. Limited evidence exists in the literature concerning the use of ergonomics for injured workers rehabilitation and RTW strategies (Leyshon and Shaw 2008). However, empirical evidence suggests that ergonomic interventions may be effective for worker's RTW outcomes (Anema et al. 2004; Baldwin et al. 1996; Habeck et al. 1998; Loisel et al. 2001). More research is needed using the ergonomic model and examining RTW outcomes.

Table 2.4 Comparison of the ecological/case management model to the economic model

	Ecological/case management model	Economic model
Main tenets	• Occupational disability (previously injury) should be understood in a systemic context considering the interplay among the macrosystem, mesosystem, and microsystem (the individual) • Occupational disability has multiple societal stakeholders, including employer, healthcare, insurance system, and family; each of the stakeholders has different disability paradigms and anticipated RTW outcomes	• Macrosystem of economic forces plays a predominant role in disability • Focus on labor force participation, economic incentives, shifts in labor demand, the effects of discrimination, and the long-term economic impact of injury
	• Work injury is understood and managed within the sociopolitical context of the workplace	• Disability periods are not simple episodes but are recurrent, and these patterns are predictors of future disability
	• The needs of the workers and the employers can be complementary	• Longitudinal approach
	• System-based responsibility for outcomes	
	• Workplace characteristics significantly influence injury sequelae/recovery and rehabilitation	
	• Employer has a critical role in RTW and needs incentives to assist injured workers. System changes necessary to accommodate RTW needs of injured worker	
	• Multidisciplinary approach	
	• Proactive and disability prevention focused	
	• Early intervention in the workplace	
	• Service recipient seen as microsystem	
Underlying values	• Integration of prevention, rehabilitation, and RTW	• Improvement of macrosystem
	• Harmonious multisystem relationships	
	• Protection of injured worker from exploitation	
	• Cost containment	
Implications for diagnosis	• Assessment of the impact of macrosystems, mesosystems, and multisystem interactions on RTW	• Individual clinical diagnosis is of secondary importance
	• Define outcome according to the stakeholder • Focus on the assessment of functional work capacity, preferably "in vivo"	• The identification of longitudinal patterns of disability in a macrosystem is of key importance
	• Analyze the impact of work characteristics and workplace barriers and facilitator on RTW	

(continued)

Table 2.4 (continued)

	Ecological/case management model	Economic model
	- Identification of early risk markers for occupational disability (flagging)	
	- Importance of correct clinical diagnosis (label) is secondary	
Implications for treatment	- Disability management in the workplace	- Effective treatment is expected to impact disability
	- Treatment integrated with RTW process	- RTW patterns over time, not a single episode
	- Work conceptualized as therapy - Work return transition programs and job accommodation	- Cost-offset data on RTW interventions are important
	- Integrated case management approach	
Implications for compensation	- Reduction in long-term disability costs - Costs partly shifted to the specific accident employer	- Can account for multiple economic factors that impact long-term RTW among injured workers
		- Able to identify and quantify the macrosystem inputs to work disability instantaneously and over time
		- Cost reduction due to improved system-based identification and intervention targeting multiple economic factors in RTW over time

Adapted from Schultz et al. 2007

Table 2.5 Summary of the ergonomic model

	Ergonomic model
Main tenets	- Adaptation
	- Prevention
	- Identify workplace risk factors
Underlying values	- Injury prevention
	- Outcome = return to work
Implications for diagnosis	- Multidimensional/interdisciplinary diagnosis
	- Identifying prevention strategies in order to lower costs
Implications for treatment	- Injury prevention and adaptation are important
	- Worker and system are co-responsible for RTW outcome
Implications for compensation	- Greater rehabilitation, lower costs

Adapted from Schultz et al. 2007

2.3.5 Biopsychosocial Models

The biopsychosocial model of RTW integrates key aspects from both the biomedical and the psychosocial model. It focuses on the conceptual interaction among biological, physical, behavioral/psychological, and social factors. However, a more complete comprehensive biopsychosocial model includes medical, psychosocial, environmental, and ergonomic factors in addition to those mentioned previously, all within a system-based approach (Peterson and Threats in press; Schultz et al. 2007). As a strength, this model was developed using empirically driven risk factors and the cumulative clinical experience with clients with chronic musculoskeletal pain. However, some see the latter as a limitation to the model (Schultz et al. 2007). Peterson and Threats (in press) asserted that this perspective has the "potential to inform healthcare in the broadest sense, while providing specific benefit to people with disabilities by using a universal, culturally sensitive, integrative and interactive model of health and disability that is sensitive to social and environmental aspects of functioning." Refer to Table 2.6 for a summary of the main features of this model.

Regarding disability and RTW, a complex relationship exists between many factors including pain, physical and psychological impairment, and functional and social disability (Gatchel 1996; Schultz et al. 2000; Turk and Monarch 2002). Because of its complexity, the biopsychosocial model considers the interactions between the injured worker (or person with disability), the employer, case managers, medical providers, and social environment (Schultz et al. 2007).

Feuerstein (1991) introduced an early approach to the biopsychosocial model. This model proposed that work demands required by the job in relation to the worker's current physical condition formed key factors in RTW. Medical status and behavioral/psychological resources further influenced these relationships. See Fig. 2.2 for an overview of this approach. The Center for Occupational Rehabilitation at the University of Rochester used this model as the basis for its comprehensive multidisciplinary rehabilitation program (Feuerstein and Zastowny 1996; Linton et al. 2005). While this model incorporated ergonomic factors related to the work demand component, the overall system was not reflected in this model.

More recent scientific contributions emphasize the recognition of the dynamic, time-based (temporal) dimensions of the RTW process. Evidence suggests that RTW and occupational disability should not be considered static employment outcomes (Linton et al. 2005). It recognizes that risk factors may change over time and takes workers' expectations into account; both elements have been shown to play a large role in recovery and RTW (Schultz et al. 2007). Other notable contributions include a three-phase back disability model and an eight-phase occupational disability model. Although differences exist in the integration of social and medical definitions and the definition of occupational disability, similarities are found in the alignment of disability risk factors by phase and the application of specific interventions for each phase (Krause and Ragland 1994; Main and Spanswick 2000). More recently, the three phases of back pain disability, namely, acute, subacute, and chronic, have emerged (Dasinger et al. 2001; Krause et al. 2001; McIntosh et al. 2000).

Franche and Krause (2002) proposed a Readiness to Return to Work model that weaves in stages of change identified by Prochaska and DiClemente (1983) (i.e., pre-contemplation, contemplation, preparation for action, action, and maintenance). Subsequent developments include a self-report staging scale for injured workers with musculoskeletal injuries (Franche et al. 2007) and a reconceptualization of the stages with workers with musculoskeletal injuries (i.e., workers with workplace difficulties, workers with no workplace difficulties and back pain, and workers with multiple difficulties, in particular, depression) (Steenstra et al. 2010). Empirical validation of the model within the RTW context is still needed. In addition, more generally speaking, a stage-based model is challenged based on the recognition that many conditions do not fit neatly into arbitrarily assumed stages and outcomes (Schultz et al. 2007).

Table 2.6 Summary of the biopsychosocial model

	Biopsychosocial model
Main tenets	• Response to injury considered to be multidimensional
	• Medically defined impairment does not reliably predict disability and symptoms Psychosocial factors mediate one's reaction to injury
	• Interdisciplinary/transdisciplinary whole person approach
	• Focus on self-responsibility and self-management of the worker
	• Disablement and RTW are time-based processes
	• *Role of beliefs*
Underlying values	• Client and his/her well-being
	• Outcome = improved function
	• Chronicity prevention
	• *Beliefs shape expectations*
Implications for diagnosis	• Multidimensional/interdisciplinary diagnosis
	• Admission of limitations of diagnosis
	• Functional focus in assessment
	• Early assessment of medical, psychosocial, and system-based risk factors for disability
	• Identification of biopsychosocial factors responsible for readiness to RTW, including stage/temporal aspects of the process
	• Treatment-oriented assessment
Implications for treatment	• Treatment and RTW more important than diagnosis
	• Coping is a desirable outcome if cure not possible
	• Worker as an active participant in the process and responsible for the outcome
	• Coordinated team and case management approach
	• Linkages with the environment the worker returns to (e.g., employer, family)
	• Time-based intervention approach with flexible early intervention dependent on readiness to RTW
	• *Expectancies are related to recovery and RTW*
Implications for compensation	• Clear guidelines required for compensability if exact causality/etiology unknown or interactive
	• Higher rehabilitation, lower compensation costs
	• Compensability primarily for treatment failures and permanent impairment
	• Compensation used as an incentive for rehabilitation/RTW

Adapted from Schultz et al. 2007

A newer addition to the biopsychosocial model is the role of beliefs and expectations (Stewart et al. 2012). Beliefs are understood to shape expectancies of RTW (Halligan 2006; Main and Spanswick 2000); for example, investigators have found that beliefs and corresponding expectations may hinder recovery and RTW (Burton et al. 2006).

Notably, no single, unified biopsychosocial model exists in either research or clinical applications. Including personal characteristics, microsystem interrelationships, reciprocal interactions, expectation factors, time factors, and environmental variables are recommended (Schultz et al. 2007). While the biopsychosocial model may have many strong features over some of the other models, two problems still remain: its generic nature and lack of specificity (Imrie 2004). This model, similarly to the medical model, might lead to medicalization or "professionalism"

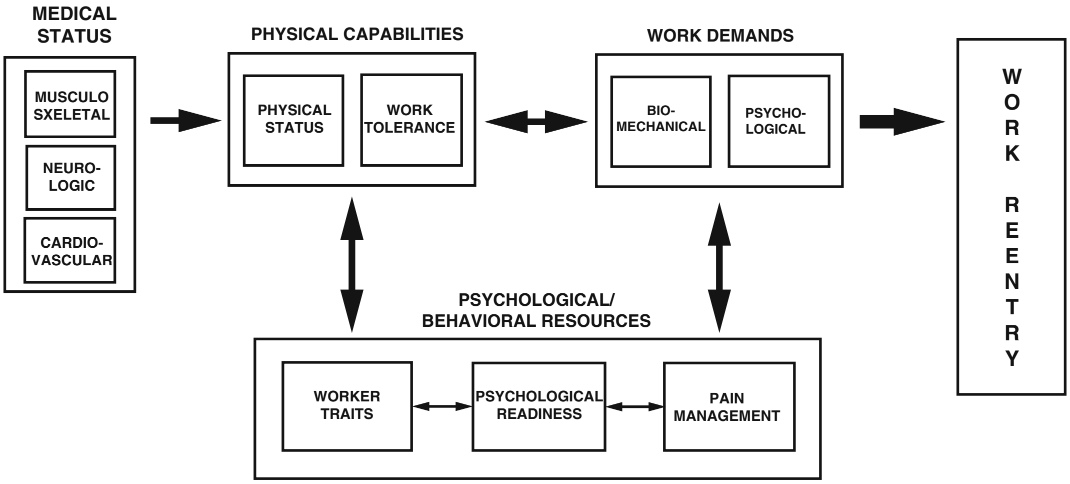

Fig. 2.2 Multiple factors potentially affecting RTW (Feuerstein 1991)

(Weiner 2008) or imply that common health problems may be viewed as more complex than necessary. In this vein, Waddell and Aylward (2010) argued that:

> "Biopsychosocial problems are sometimes implied to be so complex that they can only be managed by (multidisciplinary teams of) health professionals. Yet most patients with common health problems can be managed satisfactorily in primary care by following a few basic principles. Only more difficult issues need referral to other professionals and only the most complex require a multidisciplinary team." (p. 28)

2.4 Current Perspectives

Schultz et al. (2007) identified key features of recent RTW models. Namely:

- Psychosocial model evolution: The traditional, psychiatric model has been replaced by the broader psychosocial model, emphasis on adaptation, individual cognitions on disability within a social context, and cognitively mediated motivational factors.
- Stage-based models of RTW: These models have shown greater articulation of the RTW process including temporal elements and disablement patterns such as psychosocial factors interacting with time and medical recovery.
- Ecological/case management model changes: This model has expanded to include reciprocal interactions between stakeholders such as the employer, insurance systems, healthcare, society, and the worker.
- Reduced role of biomedical and forensic models: The traditional forensic model has been narrowed in its application to forensic applications within the court system. For insurance systems, the forensic model has evolved to shift away from questions of compensability to greater effectiveness in managing the health-care costs. This change shows greater compatibility with the ecological/case management model. In addition, greater importance on complex relationships between individual factors including motivation, social systems, and cognition shows a shift toward the biopsychosocial model.
- Macrosystem perspective on economic elements: With the development and persistence of occupational disability, a greater focus on the macrosystem of economic factors is noted.
- Greater reliance and support for the biopsychosocial model: Evidence-based support in RTW literature and healthcare and greater awareness and work toward operationalization of the interactions between individuals and systems and the depth of the multidimensional system.

The Institute of Medicine (NRC and IOM 2001), the World Health Organization (WHO 2001), and Faucett (2005) have proposed models of RTW that integrate the most salient features of the aforementioned models. The model presented by the IOM, which was proposed by a group of clinicians and scientists from a wide range of disciplines, integrated certain factors that could potentially impact pain and disability (Wunderlich et al. 2002). Masala and Petretto (2008) asserted advantages of this model over the ICF: it more clearly conceptualizes disablement as a "here-and-now" dynamic process when environmental and societal needs collide with personal limitations, offers a transdisciplinary versus a multidisciplinary perspective, and provides a fuller analysis of the links between factors, such as environmental and societal. However, a greater understanding of epidemiological, laboratory, and clinical research is needed to obtain a more complete view of work-related musculoskeletal disorders (NRC and IOM 2001). See Fig. 2.3.

The WHO's most recent disability model is the International Classification Functioning, Disability, and Health Model of Disability (ICF; Dahl 2002; Steiner et al. 2002; WHO 2001). It places emphasis on health and functioning, rather than on disability. It describes the unique situation of the individual under evaluation using health and health-related domains; thus, similar health conditions do not imply similar functions.

Major themes related to this model include qualitative and quantitative applications (e.g., use of medical, statistical, and experiential data in research and practice), recognition of nonlinear,

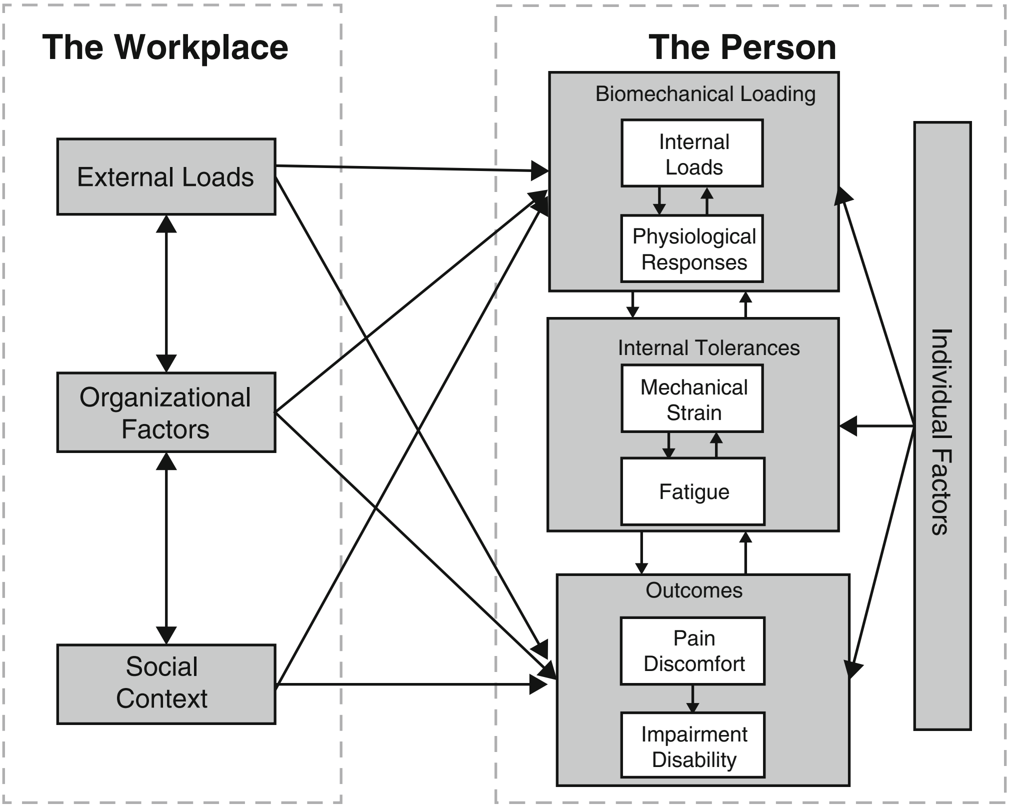

Fig. 2.3 Institute of Medicine Model of Disability (IOM 2001)

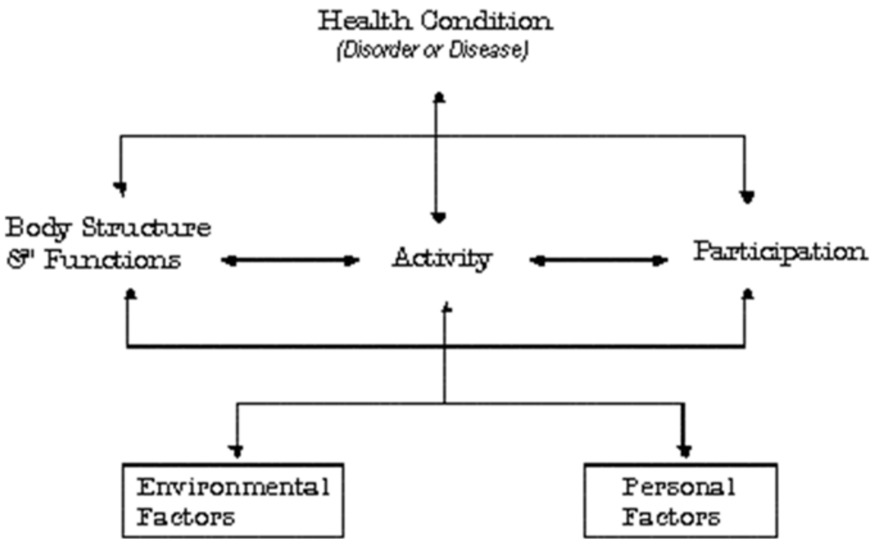

Fig. 2.4 The World Health Organization International Classification of Functioning, Disability, and Health (ICF) Model of Health (WHO 2001)

reciprocal, and dynamic interactions for optimizing health, societal factors, environmental barriers, and a person-centered approach. The ICF model includes factors not traditionally considered in healthcare while using individualized, innovative, and nontraditional interventions and a health outcomes measurement approach (Peterson 2011; Peterson and Threats in press). In addition, this model represents a significant health-care development; it can be used as a standard in concept definition, relationship hypothesis, construct building, and a proposal of new theories (Peterson 2005). See Fig. 2.4.

The main intent of the model is its biopsychosocial nature; however, interestingly, societal elements appear to be emphasized even though medicine is at the core of the model (WHO 2012). This model implicitly conceptualizes disability with medical, biological, and social functions.

The ICF places notions of "health" and "disability" into a new framework by examining these factors at both the individual and population levels. Disability is normalized as well. Any individual is susceptible to declines in health and functioning and therefore prone to experiencing some degree of disability in their life: disability viewed as something that can happen to anyone (WHO 2012). The model also attempts to shift the focus from cause to impact, comparing health conditions equally across one metric.

The ICF has been touted to have a range of applications. At the individual level, the ICF may be used to assess the individual, plan treatment, evaluate the treatment or other intervention, and communicate among health-care providers and for self-evaluation (WHO 2002). For example, for adaptation to medical settings, over 1400 codes organized into more than 30 Core Sets have been applied to this model (Peterson and Threats in press; WHO 2001). The ICF may be applied institutionally for educational and training purposes, resource development and planning, quality improvement, management, and outcome evaluation. At the societal level, the ICF may be used to determine eligibility requirements for entitlements, social security benefits, disability pensions, and workers' compensation and insurance, social policy development, needs assessments, and environmental assessments. The ICF may assist scientific research by providing a framework for interdisciplinary research on disability and making research comparable and facilitate intervention studies that compare outcomes on similar populations (WHO 2002). The flexibility of this model extends usage in any setting, culture, and context (Escorpizo et al. in this Handbook).

Escorpizo and colleagues (Escorpizo et al. 2011a, b; Escorpizo et al. in this Handbook) have aligned the ICF model by reframing vocational rehabilitation, a multi-professional approach for sustained RTW, within the ICF model. This approach supports further application and operationalization of the ICF within vocational rehabilitation and RTW functions; the development of a comprehensive ICF Core Set for the use within vocational rehabilitation follows (Escorpizo et al. 2010). Please see the chapter by Escorpizo et al. in this handbook for further details.

Criticisms of the ICF model include its failure to specify the content of biopsychosocial theory that underlies it, an atheoretical definition of impairment (Schultz et al. 2007; Van der Ploeg et al. 2004), and difficulty in operationalization and application (Dahl 2002; Steiner et al. 2002; Van der Ploeg et al. 2004). That said, this model enjoys a general acceptance from many professionals and advocacy groups (Peterson and Paul 2009).

Future development of this model includes expansion of the ICF research areas beyond high-income, developed countries, simplification of the coding system (as overlaps and redundancies have been identified), further operationalization of activity and participation concepts, standardization of qualifier use that demonstrates the degree of function impact, and additional code development (Peterson and Threats in press).

Finally, Faucett (2005) proposed a comprehensive RTW model for musculoskeletal disorders, an extremely common disability with significant repercussions in financial, work, personal, and social arenas (WHO 2003). This model integrates psychosocial aspects with micro- and mesosystem influences from the job and environment, following a comprehensive review of existing related models and ergonomic theories. Key categories are work barriers, worker perceptions, worker strain and recovery, injury outcomes, work environment, and management systems. Emphasis is placed on management systems and the work environment. The management systems component, which considers functional, physical, temporal, and interpersonal characteristics, is viewed to alter the work environment to enhance workflow. In turn, the work environment, which acknowledges the importance of culture, resources, workforce, decision-making, communications, and operations, directly impacts worker performance, productivity, and outcomes and indirectly impacts work flow barriers, strain, and worker perceptions. A bidirectional relationship between strain and recovery and outcomes is suggested. Managing the work environment is offered as the key solution. An underlying assumption is that the outcomes need to be considered in the context of the worker's organization (Faucett 2005). Empirical validation of this model is needed. See Fig. 2.5.

2.4.1 The Role of Perceived Uncertainty

Research has shown that many factors influence expectations for RTW (Schultz et al. 2002, 2004); expectations influence medical outcomes and prejudice interpretations (Halligan 2006) and may play a role in the RTW process (Sampere et al. 2012; Stewart et al. 2012). In addition, expectations may hinder recovery (Burton et al. 2006).

Literature mostly focuses on the biomedical or forensic models of RTW without considering either problems inherent to the process or other relevant factors (Stewart et al. 2012). Stewart et al. (2012) used a biopsychosocial framework to qualitatively identify a new and important factor that plays a key role in RTW outcomes, *perceived uncertainty*. The investigators defined perceived uncertainty as "an awareness of not knowing what will happen in relation to health, work and life in general" (p. 7) and can consist of "anxiety, despair, and confusion, or hope and opportunity" (p. 11). Perceived uncertainty is the overarching concept constructed from five interrelated sub-constructs: (1) perceived lack of control over the RTW process, (2) perceived lack of recognition by others of the impact of the injury on the worker, (3) perceived inability to perform

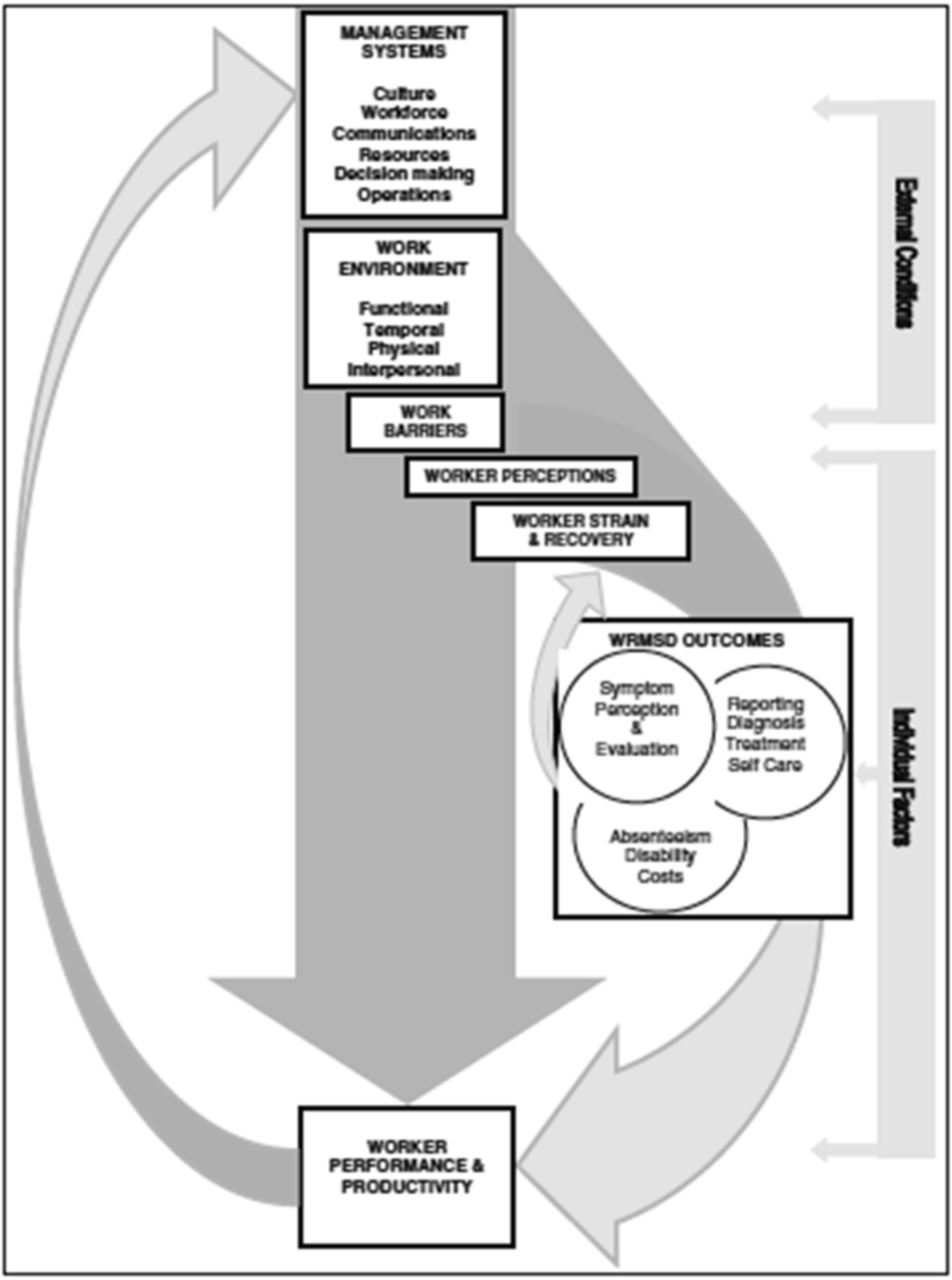

Fig. 2.5 Integrated model (Faucett 2005)

pre-injury job(s), (4) perceived (lack of) workplace accommodation, and (5) fear of movement/(re)injury. Some of the key elements to the constructs of perceived uncertainty are: (1) the ability of each element to interact with the other; (2) in regard to the biopsychosocial model, each construct that can be individually influenced; and (3) perceived uncertainty in one construct that may lead to increased perceived uncertainty in another construct.

Stewart et al. (2012) found that most participants, who had subacute back pain and had been off work between 3 to 6 months, were reluctant to articulate expectations for RTW because of uncertainty regarding the RTW process and ability to return to pre-injury work status; this evidence provides empirical support for the role of perceived uncertainty in the RTW process. Sampere et al. (2012) argued that RTW expectations are an important factor in the RTW process for workers on long-term, non-work-related sick leave. In addition, Tjulin et al. (2010) found that workplace uncertainty impacts how coworkers of the injured individual act during the RTW process. Future research may be aimed at examining the interaction between the constructs of perceived uncertainty, how they influence expectations of RTW, and how they play a role in the work place among coworkers. Table 2.7 lists the categories, properties, dimensions, and examples of the core concepts of perceived uncertainty. Figure 2.6 represents the relationship of perceived uncertainty to the formation of expectations of RTW.

2.5 Research and Practice Challenges

Research and practice challenges are numerous for developing an effective RTW model. Current models do not yet allow for consistent research validation; they are evolving and are not yet constructed soundly. Further research around the utility, efficiency, internal consistency, and generalizability is required. Definitions of RTW require further clarification and consistent operationalization for dependency on a relevant stakeholder and the system (Krause et al. 2001a. These definitions need to be situated around patterns rather than single episodes and require additional information, such as cost and disability duration. These aspects, however, are rarely found in RTW and occupational disability models (Linton et al. 2005).

Work outcomes need standardization of operational definitions (Young et al. 2005) and require consensus on which dimensions of RTW taxonomy provide the most valid measures. Relatedly, within the ICF model, operationalizing the concepts of participation and activity (e.g., Avila et al. 2010), addressing the atheoretical definition of impairment (Schultz et al. 2007; Van der Ploeg et al. 2004), and expanding the participants used to validate the model for further cross-cultural use, coding complexities, and lack of language standardization require additional attention (Peterson and Threats in press). The validation work of Faucett (2005) and IOM (NRC and IOM 2001) is required to allow for a more in-depth analysis.

A multi-perspective and multimethod approach in measuring RTW outcomes (e.g., self-report, economic measures, and behavioral measures) likely will prove the most effective in addressing these time-dependent, multidimensional, and complex constructs (Friesen et al. 2001). Finally, the emerging methodology of multisystem interactions requires further articulation; using qualitative and qualitative approaches in addition to statistical modeling and path analysis is recommended (Friesen et al. 2001; Schultz et al. 2007).

An effective RTW model appears to include certain qualities that are useful for key stakeholders, including workers, clinicians, and researchers. Evaluation of future models may consider the following criteria:

- Parsimonious. A balance of delineating potential relationships between risk factors and an appropriate complexity to allow for testing a

Table 2.7 Categories, properties, and dimensions of perceived uncertainty in the formation of expectations of return to work for injured workers with subacute back pain (Stewart et al. 2012)

Category	Properties	Dimensions	Examples
Perceived uncertainty	Awareness of ambiguity about present and future options in relation to RTW and life in general	Individual differences regarding tolerance of perceived uncertainty; interpersonal relationship stressors; systemic powerlessness	*Micro*: physical abilities, pain management, recovery timeline home life, leisure activities *Meso*: rehabilitation services, financial concerns, coworkers, accommodations; stigma *Macro*: future employment, labor market, retirement plans
Perceived (lack of) control over the RTW process	(Lack of) participation in decision-making processes related to rehabilitation and RTW	Degree of collaboration in RTW process; relative power or powerlessness; feelings of self-worth; (lack of) voice; being suspected of malingering	*Micro*: (in)ability to manage pain, medications, sleep, concentration *Meso*: coordinating appointments; mobility challenges, changing family roles/tasks (lack of) workplace accommodations *Macro*: rehab timelines, rights re accommodations; insurance policies re objective findings
Perceived (lack of) recognition by others of impact of injury on worker	Invisible nature of back injury; sudden, unexpected event; subjective nature of pain; being suspected of malingering	Self-doubt about extent of injury; feeling blamed/guilty re cause of injury; disclosure and accommodation concerns; stigma, discrimination	*Micro*: feel guilty while off work *Meso*: concern about RTW too early; high-risk job demands; changing family roles; unsympathetic friends, coworkers *Macro*: stigma; accommodations; future employment prospects; need for objective findings
Perceived (lack of) ability to perform pre-injury job	Level of confidence in relation to work tasks; future employment possibilities	Self-doubt re physical and psychological capabilities; being judged by others; changing identity; concerns re future prospects	*Micro*: stamina; strength; fear of pain, safety concerns *Meso*: concerns re adequacy of work simulation at rehab clinic; coworker resentments; employment termination *Macro*: stigma; work history
Fear of movement/(re) injury	Fear of dangerous workplace; high-risk job demands; fear of pain; avoidance behaviors	Pain experience; physical limitations; fear of permanent disability/dependence	*Micro*: previous injury; pain management *Meso*: workplace safety, financial pressure; changing roles at home *Macro*: accountability re GRTW, accommodations; concerns re long-term disability

(continued)

Table 2.7 (continued)

Category	Properties	Dimensions	Examples
Perceived (lack of) workplace accommodations	Level of confidence in relation to requesting accommodations or belief in their likelihood	Previous unsuccessful attempt at RTW; witnessing unmet coworker needs for accommodations; difficulty imagining their implementation	*Micro*: previous RTW attempt *Meso*: communication with employer re accommodations *Macro*: awareness of lack of implementation of accommodations in workplace; stigma: needing accommodations

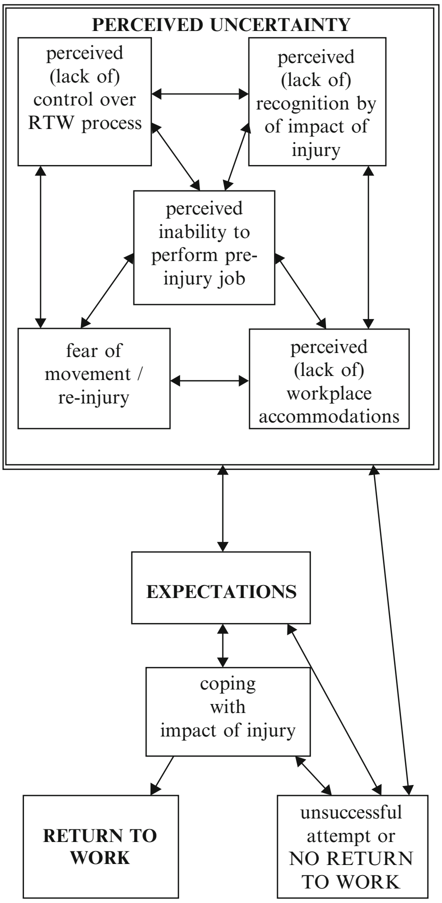

Fig. 2.6 The relationship of perceived uncertainty to the formation of expectations of return to work (Stewart et al. 2012)

model's clinical and theoretical validity using valid measures.

- Multivariable. Inclusion of independent variables that have empirically shown to have a role in occupational disability and RTW. Identification of independent risk factors and their relationships using prospective studies.
- Valid. Scientific rigor within empirical tests, particularly in whether factors in combination explain or predict RTW or occupational disability, is recommended.
- Generalizable. Application to a diverse group of workers in different countries.
- Reliable. Variable relationships within the model need to be observed repeatedly when studied by different research teams within a country and between different countries.
- Ecologically valid. Measures and stakeholders that are important in understanding RTW and occupational disability in real life need to be integrated into variables, measurement, and the interrelationships. This allows for collected information and evolving interventions to be utilized effectively in prevention, evaluation, and rehabilitation of RTW and occupational disability (Schultz et al. 2007).

Despite availability of these criteria for evaluation of conceptual models, they are rarely used in comparative RTW model analysis. This slows the advancement of conceptually and empirically validated RTW approaches, which could stimulate both research and practice.

2.6 Conclusions

Although research advances, such as the role of perceived uncertainty in RTW, support the development of improved injury prevention and rehabilitation programs, the need for a transdisciplinary model that addresses the temporal and multidimensional aspects of disability continues to exist. The models recommended for further research focus on the development and application of a multidisciplinary or interdisciplinary approach are integrative, cross-diagnostic, interactive, and translational and explore the interplay between the individual and the systems within which they function. As seen with the ergonomic model, empirical evidence is emerging, and future research will continue to build upon this (see Chap. 17 by Paquette in this handbook). Future research on RTW models should examine and be evaluated using the following criteria: (1) the interaction of factors/constructs within overarching models, (2) multivariate aspects, (3) validity, (4) generalizability, (5) reliability, and (6) ecological validity. Such careful examination will facilitate the advancement of the conceptual RTW models and stimulate quantitative and qualitative methodologies and outcomes capable of expanding and integrating evidentiary basis in the field. It will also lead to the development of effective applied RTW interventions designed for the right time, the right context, and the right people while targeting modifiable clinical, psychosocial, and environmental factors at play.

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Concept of Margin of Manoeuvre in Return to Work

3

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3.1 Introduction

Musculoskeletal disorders (MSDs) and the resulting work absences are a major health problem in industrialized countries. It is a costly and constantly escalating public health concern (Dionne et al. 2004; Elders et al. 2000; INSPQ 2005; Leclerc et al. 2005): MSDs are the main cause of disability and of the majority of cases of occupational disease (ISQ 2002). Many interventions have been developed to help workers with MSDs return to work in good health and sustainably. Historically, since the 1980s, several interventions have noted a decentralization of the actions aimed at the return to work (RTW) from the clinical environment to the actual work environment. A consensus has now developed regarding the relevance of offering RTW interventions that are both early and aligned as closely as possible with the injured workers' workplace and tasks. As long ago as 1998, in a review of the literature on the topic, Krause et al. (1998) concluded that this program type, which includes the real-life workplace environment, was effective and produced decreases in days of absence from work; following this, several systematic reviews of the subject have resulted in agreement on the effectiveness of workplace-based interventions for individuals experiencing back pain (Franche et al. 2005; Palmer et al. 2012; van Oostrom et al. 2009; Williams et al. 2007).

For more than a decade, we have tested a workplace intervention named the Therapeutic Return to Work program (Durand et al. 2001), which was adapted from the Sherbrooke model, shown to be both effective and cost-effective in a randomized clinical trial (Loisel et al. 1997, 2002). In summary, the therapeutic RTW is a program that combines reactivation with a progressive resumption of work tasks in the actual workplace under the supervision of a clinician (Durand et al. 2004). Simultaneously, an analysis of the work situation is carried out in order to propose temporary or permanent improvements,

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when necessary, for facilitating a worker's RTW. The program involves a continuous evaluation of the interaction between the worker and the environment. It also accounts the changing clinical reality of persons who reactivated and the variability of the work situation. This innovative therapeutic RTW process enabled around 70 % of those admitted to the program to RTW after an average absence of 10 months and to remain on the job 1 year later (Loisel et al. 2003; Durand et al. 2004). This type of program is usually offered by an interdisciplinary team of professionals that may include, among others, an ergonomist, occupational therapist, kinesiologist, general practitioner, physiotherapist, and psychologist.

Figure 3.1 presents the example of a worker who joined the therapeutic RTW program. She was a 42-year-old cook in a daycare center who had been off work for 11 months due to capsulitis of the right shoulder. She followed the therapeutic RTW program for 12 weeks. Her gradual re-exposure to work began during the first 2 weeks with 3 hours of work (light gray in Fig. 3.1). In the following weeks, her presence at work increased, and she took on more demanding and complex work tasks. The part of the program carried out at the clinic focused on her reactivation and on teaching active stress and pain management strategies (dark gray in Fig. 3.1). The clinicians offered both training at the clinic and support at work to the worker at moments deemed important. In the case of this worker, the clinicians (occupational therapist or ergonomist) visited the workplace in order to observe, estimate the prospects for improvement, and provide advice to the worker in weeks 1, 2, 7, and 12.

With these evidence-based results in mind, we began a research program on the interactions among the clinician, the worker admitted to a rehabilitation program, and all the dimensions of a work situation. We discovered that throughout the RTW process, experienced clinicians attempted to maintain a "space" between the work situation's requirements and the worker's ability to deal with them. Maintaining sufficient space, which some clinicians refer to as a "cushion," is related to the concept of margin of manoeuvre (MM) in the francophone ergonomics field (Coutarel et al. 2003; Guérin et al. 2006; Vézina 2001, 1998). However, this concept has never been used in work rehabilitation context. In our work, we adapted the MM concept to the rehabilitation context in order to help clinicians achieve improved outcomes of interventions designed to ensure a sustainable RTW.

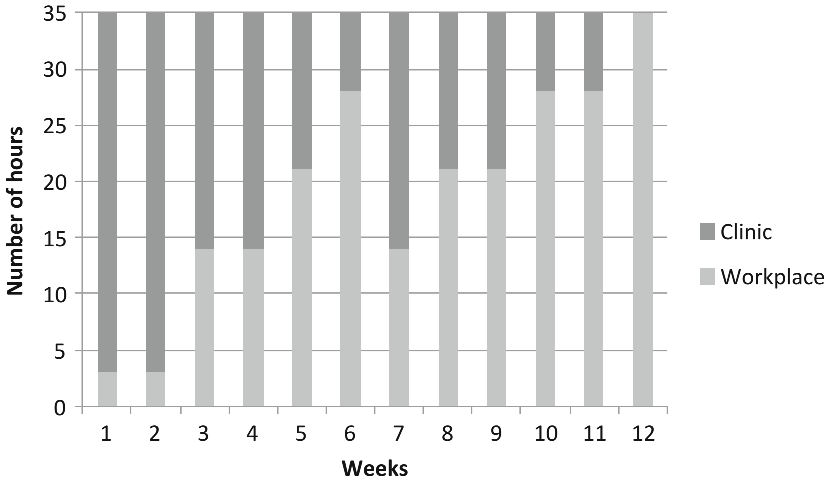
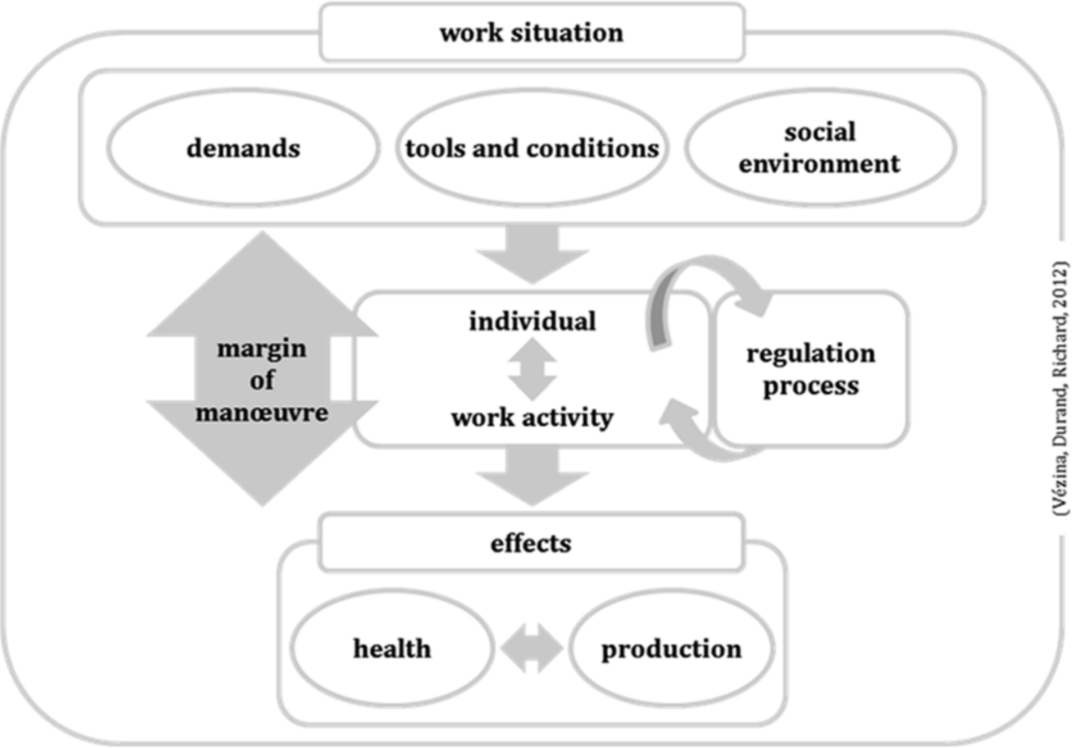


Fig. 3.1 Example of a therapeutic return to work progress. Reprinted by permission of the publisher

3.2 Definition of Margin of Manoeuvre

The margin of manoeuvre concept is central to the concept of work as put forward by francophone ergonomics. We use the definition provided by Vézina (2001), based on the writings of Guérin et al. (2001). MM is the "possibility or freedom an individual has to develop different ways of working in order to meet production targets, without having adverse effects on his or her health. This margin of manoeuvre takes into account the interaction between the individual and the work demands, including the methods and tools provided in the work environment" (Durand et al. 2009). *Thus, the MM is a regulation space for the individual involved in a work activity*. More specifically, the work adjustment or regulation process is the worker's process of continually adapting to the variations in the job demands and conditions and to those in the worker's own health or condition (Fig. 3.2). This regulation is reflected in work activities through the development of work methods and strategies adapted to the different work situations.

For example, a bagger in a grocery store has a certain MM when provided enough bags to do the job. A corporate policy to stop providing bags to customers reduces the bagger's MM. The bagger, who had developed a way of arranging the bags on the counter to avoid the onset of musculoskeletal disorders, suddenly needs to re-invent this work task; it has become even more difficult because the bags, now supplied by the customers, come in various shapes and sizes. The bagger's regulation process is therefore compromised because of a reduction in MM. Moreover, customers often forget to bring recyclable bags or to bring enough or large enough ones, which may require the bagger to develop new bagging strategies spontaneously to preserve health while providing the expected



(Vézina, Durand, Richard, 2012)

Fig. 3.2 Model of work activity and margin of manoeuvre. Reprinted by permission of the publisher level of service. If sufficient, the MM allows the worker to maintain a balance between the challenges of preserving health and attaining task-related objectives, i.e., allow for adequate productivity while minimizing health risks. This conceptualization of a work situation is divided into three main parts. At the top are contributing elements that define the work to be completed: the social environment of work, the means provided by the worker for accomplishing the work, and the demands to be met. More specifically, the social environment includes the social structures and the culture (components, such as committees, and hierarchy, relationships within organizational structure and labor relations), the functional relationships (characteristics, contributions, and needs of coworkers and other interlocutors and types of relationships), and lastly the relationships between customers and users. In the middle is the worker who performs the work, the work activity, the work regulation process, and the MM available. At the bottom and in balance are the effects of the work activity, which are twofold: the effects on the worker (health) and the effects on the company (the products of the work).

A number of ergonomic studies underscore the need for sufficient MM in the workplace to support a good fit between productivity demands and the worker's health. An insufficient MM causes an imbalance in the work regulation loop, thereby jeopardizing the production–health balance (Fig. 3.2) and sometimes translates into absence from work due to pain or disability (Coutarel et al. 2003; Douillet and Schweitzer 2002; Gaudard 2003; Gollac and Volkoff 2000; Vézina 2001, 2003). In fact, participants in RTW programs face realities where the balance has been disrupted for several months or, in many cases, severed contact with the workplace. According to this view, the simple matching of the worker's capacities on the one hand with the job demands on the other is not enough to reestablish the necessary balance. A broader view must be adopted, which includes all contributory elements for a MM.

3.3 Types and Dimensions of Margin of Manoeuvre in a Work Rehabilitation Context

Several types of MM are present throughout the RTW process. Specifically, from our research, four types exist based on the four pivot points in the RTW program: initial, potential, therapeutic, and final.

1. **Initial MM (MMi)**. The margin of manoeuvre held by the worker at the job prior to the current sick leave (pre-injury). This is determined during the initial interview with the worker.
2. **Potential MM (MMp)**. The margin of manoeuvre evaluated during the first weeks of the RTW program by the rehabilitation team; factors include results of the initial evaluation by a worker from each of the team's disciplines, the worker's capacities as observed in a clinical setting, and the job demands as described by the worker. The MMp describes the clinicians' achievement expectations by the end of the rehabilitation program.
3. **Therapeutic MM (MMt)**. The margin of manoeuvre maintained throughout the therapeutic RTW program. During this period of exposure to work, the increase in the worker's capacities and job demands does not appear linear. Because the workers' health status may vary, as may the job demands, the MMt planned by the clinicians becomes the means for preserving therapeutic value of retraining upon exposure to work. To maintain a sufficient MMt, the clinicians attempt to modulate the exposure to work based on the worker's condition (e.g., capacity, fears, pain) and the characteristics of the work situations. Accordingly, as part of weekly RTW planning, the components of the MMt are systematically reviewed by the clinicians. A new MMt is established and communicated to the worker and the manager. During the end-of-week analysis of the MMt, three results may arise: the MMt can be deemed insufficient, barely

sufficient, or sufficient. Based on the data obtained, the clinicians modify the components of the proposed new MMt. If the MMts were deemed barely sufficient, one could, for example, offer to schedule the worker's work hours differently during the week, to enlist a coworker's help when performing the most difficult task, or to make it possible for the worker to notify the immediate superior when he needs to take a break. The same MMt could be kept for another week to increase the worker's adaptation to RTW. If the MMt is deemed insufficient, a temporary reduction in work hours or a modification of aspects of the physical layout of the work station could be proposed. Lastly, if the MMt were deemed sufficient, the gradual increase in work hours and tasks would continue. Thus, throughout the program, several MMts are created in the progression and conclusion at the pre-injury duties, where possible.

4. **The Final MM (MMf)**. The margin of manoeuvre found at the end of the program. If it is sufficient, it will favor a sustainable RTW.

For clinicians, the initial MM (MMi) is used as a program guide. Can it be reestablished? Was it sufficient before the worker went on leave? Where the MMi is deemed insufficient, it is important to target the contributing factors to this decline to allow for alterations (e.g., lack of resources, unavailable equipment or lack of opportunity to take a break). Thus, the components of the final MM (MMf) can be different from those of the initial MM (MMi), either due to a change in the work situation characteristics or in the worker's capacities. For example, a plumber in the residential sector who is off work due to back pain could, at the end of a RTW program, have reduce physical work capacity when compared to pre-injury, reducing the worker's MM. However, despite this, the worker might resume work with no health risk while maintaining an adequate output, if additional and adequate means for regulating work activity are available. For example, the plumber may obtain assistance when carrying loads or may plan tasks to reduce the frequency of lifting.

In short, a worker's MM evolves throughout the RTW program, from theoretical design (MMi and MMp) to actual application (MMt and MMf); it serves as a guide for clinicians for determining the return to work pace (MMt), a verdict on the resumption of work, and a marker for sustainability at work in good health (MMf).

3.4 Margin of Manoeuvre Indicators in the Rehabilitation Context

Thirty-eight observable indicators were identified, making it possible to assess the MM available at work (Durand et al. 2008). These indicators were identified and classified according to the six dimensions defined in Vézina's model (2001): (1) the social environment, (2) the employer's requirements and expectations, (3) means and tools, (4) the worker's personal parameters, (5) the work activity and regulation process, and (6) the impacts of the work situation. The full set of indicators is presented in Table 3.1.

3.5 Steps in Creating Margins of Manoeuvre at Work as Part of a Return to Work Process

As mentioned, the process of creating MM takes place within an RTW program that includes, as a main component, progressive exposure to work in the actual workplace. The steps of the program are named in Table 3.2.

In the remainder of this section, a fictional case history will be used to illustrate the various concepts. The MM evaluation process during the steps of the RTW program is also presented.

Ms. Simon, age 43, works as a packer at a small cosmetics manufacturer. Ms. Simon fills containers with various products (creams, soaps) and places them on palettes, which she then piles six high before transferring them to the shipping department. She is currently at work, where she performs all her usual tasks on schedule. She meets the production requirements while staying *in good physical and psychological health, and she generally feels satisfied with her work. Ms. Simon has a sufficient margin of manoeuvre in her work. This is the initial margin of manoeuvre.*

One afternoon, because a coworker was absent, Ms. Simon performs alone a lifting task that she normally does with the coworker. She lifts a palette of bottles by herself and immediately feels a sharp pain and stiffness in her neck and shoulders. She can no longer meet the requirements of her job and is forced to stop. Mr. Simon notifies her immediate superior and leaves work. Thus, following a change in the work situation, the worker's margin of manoeuvre has become insufficient or nonexistent.

Ms. Simon sees a general practitioner about her problem and is diagnosed as having a cervical sprain. The physician refers her to a RTW program.

3.5.1 Step 0: Preadmission Evaluation

The clinical team receives a referral in order to assess the situation and orient the interventions aimed at Ms. Simon's return to work.

Upon receiving the medical referral, the clinical team has a set of information: diagnosis and functional limitations, accident history, presence of comorbidity, job title, date of the incident, description of the job position, and reports of previous visits with health-care professionals. A call is then made to the employer to confirm that an employment relationship with the worker exists and to obtain a description of the position she holds.

An appointment is then proposed to Ms. Simon for an evaluation as part of the RTW program.

Ms. Simon attends the appointment for a preadmission evaluation. During a half day, she meets several health-care professionals.

The team carries out an evaluation that includes, at a minimum, the following elements: the history of the current problem, the earlier medical and work history, the description of the current symptoms, the socio-familial history, and the worker's expectations regarding the RTW program. A summary of the current physical capacities is also prepared. More specially, with respect to work, it is necessary to obtain from the worker relevant information about the following factors: the general description of the work activity, the schedule, the tools and equipment used, the quality of the job atmosphere and labor relations, the difficulties encountered at work (e.g., postures, efforts, thermal environment, pace, quality of labor relations, support, conflicts), the more appreciated and less appreciated aspects of work, and the worker's perceptions and expectations regarding the RTW.

During this preadmission evaluation, a target to be reached at the end of the program is established with the various persons involved. The objective of the RTW program is to assist in reaching the identified target. The target could include various options, such as: RTW in a full-time capacity in the position held before leaving work, RTW in the position held before leaving work but at 80 % of the original work hours, RTW in another position with the same employer, or RTW in a similar position with another employer.

For Ms. Simon, the target is to return to full-time work in the current position. At this point, the clinical team attempts to estimate, based on the information provided, what Ms. Simon's initial margin of manoeuvre was before she left work.

The estimation of initial MM is partial, based on a limited number of indicators. Also, if the MMi is deemed insufficient, evaluating the indicators will make it possible to understand why and then to propose means for improving it to ensure that the worker can return to and stay at work.

This way, the team completes the preadmission evaluation phase of the worker and of her work situation. A therapeutic RTW program of about 12 weeks is then proposed.

The rehabilitation program is explained to Ms. Simon: after several weeks of in-clinic training, she will go to work for several hours to perform certain target tasks. Then, gradually, more hours will be added, and more tasks will be integrated until the end of the program. At the same

Table 3.1 Dimensions and indicators of the margin of manoeuvre

Dimension	Definition	Indicators
Social environment	This dimension refers to the work culture and organization, as well as relations with colleagues and hierarchy	• Quality of management's empowerment practices • Overall level of quality of the work atmosphere • Description of the work context • Characteristics of the company • Quality of the superior's empowerment practices • Level of support from coworkers
Employer's requirements and expectations (demands)	This dimension includes the employer's requirements and expectations of the worker in terms of prescribed work, required technical skills, work schedule, and tasks and operations to be performed	• Importance of the risk factors and limitations • Level of versatility • Level of output required • Level of availability required • Level of mobility required • Job demands
Conditions/means and tools	This dimension includes all the organizational and physical means/opportunities provided to the worker by the company	• Job demands versus the worker's level of accomplishment of work • Level of adequacy of the means and opportunities
Personal parameters (worker)	This dimension includes all the parameters specific to the worker and comprises three groups of indicators, specifically: worker's perceptions, worker's capacities, and worker's living situation	Worker's perceptions of: • Condition • Treatment • Health and disability • Work demands • Available means at work • Value placed on work Worker's capacities: • Level of physical capacity • Level of cognitive and social capacity • Feeling of self-efficacy regarding work Worker's living situation: • Level of support and involvement of close family and friends • Level of stress associated with the family situation • Balance in personal schedule (over 24 h)
Work activity	This refers to the real work performed by the worker on a daily basis, as opposed to the prescribed work, which corresponds to a theoretical description of tasks	• Level of use of the means and opportunities • Difficulties encountered in work versus strategies used to deal with them (self-regulation)

(continued)

Table 3.1 (continued)

Dimension	Definition	Indicators
Impacts of the work situation (effects)	This dimension encompasses two groups of indicators concerning the level of the worker's health and level of production output. It reflects the consequences of a sufficient or insufficient MM	Health: • Frequency of the symptoms • Intensity of the symptoms • Duration of the symptoms • Recovery problems • Sleep problems • Changes in drug consumption • Presence of new injury/symptoms Production output: • Level of achievement of the production objectives • Duration of production • Level of achievement of the pace of production

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Table 3.2 Steps of the therapeutic return to work program and estimation of the corresponding margin of manoeuvre

Step	Step of therapeutic return to work program	Estimation of margin of manoeuvre (MM)
Step 0	Preadmission	Estimation of the initial MM
Step 1	Initial evaluation	Estimation of the initial and potential MMs
Step 2	In-clinic training of the worker and the clinical team's actions at the workplace	Creation of the first therapeutic MM
Step 3	Progressive exposure to work	Analysis, adjustment, and creation of the subsequent therapeutic MMs
Step 4	End of the program	Estimation of the final MM

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time, changes to various aspects of the work setting (the work environment, equipment, organization, and adaptations to make performing the activity easier) may also be made in order to facilitate the worker's return to work. Lastly, the program's specific objectives are detailed, and the terms and conditions of the intervention are presented to Ms. Simon by the team.

3.5.2 Step 1: Initial Evaluation

Based on the preadmission evaluation, the clinical team attempts to estimate the potential MM, i.e., MM considered achievable by the end of the work rehabilitation program. The clinicians also attempt to assess the changes and the difficulty of reaching the RTW target at the end of the program.

Evaluation of the potential MM is based on the following aspects:

- Relative to the worker: evaluation of residual capacities and estimation of the capacities that may be achieved after training (the potential for improving the worker's capacities)
- Relative to the work setting: evaluation of the work demands before the sick leave, an overview of the characteristics of the overall work environment, and estimation of the likelihood of improving the work performance conditions (the potential for improving the work situation)

This estimation of the potential MM begins with the results of the preadmission evaluation. It continues with the ongoing reevaluation that is done during the in-clinic retraining phase and is then based on the results of one or more observation visits to the workplace. The potential MM is evaluated by the clinicians particularly during the first 2 or 3 weeks.

The first visit to the work station usually takes place during the first 2 weeks of the RTW program. This visit, accompanied by the worker and involving observations of the work situation and discussions with the worker and her coworkers, makes it possible to better estimate the potential MM. The worker is still off work at the time of this first visit.

Thus, the potential MM is estimated as of the preadmission evaluation and is continually readjusted up to the moment that the worker begins her progressive RTW. If necessary, the estimation may also be readjusted during the progressive RTW phase. Therefore, the accuracy of the estimation of the potential MM depends on accurate observation and analysis of the current condition and of the evolving condition of the worker and her work situation.

In addition to the information contained in the medical file, the clinical team needs to know the following indicators:

- **Relative to the work setting**: overall context of work, the characteristics of the company, the employer's initial job demands (prescribed job demands) for the worker, and the initial means (material and organizational)
- **Relative to the work activity**: initial characteristics of the work activity
- **Relative to the worker**: feelings of self-efficacy, capacities, level of cognitive ability, level of self-regulation, and life situation (socio-family relationships)

3.5.3 Step 2: In-Clinic Training of the Worker and the Clinical Team's Actions at the Workplace

Ms. Simon begins training to improve her work capacities.

At the same time, action is taken to reduce the obstacles to work and put in place conditions conducive to the resumption of work.

A meeting is held with the employer at the beginning of the program to establish the terms and conditions of a progressive RTW and encourage cooperation throughout the process. Accompanied by the worker, the clinicians will visit her workplace, even if she is not carrying out any work tasks at present. The observations will make it possible to better understand the usual work activity, the related constraints, and the work setting.

As the days go by, Ms. Simon meets with the members of the clinical team, who propose to her various means for improving her work capacities. She trains in the clinical setting 5 days a week for 2 full weeks.

During this step, the clinical team refines its evaluation of the potential MM. By analyzing the indicators that are present, the team can extrapolate an evolvement of both the worker's capacities and the work situation, making it possible to more accurately evaluate the worker's potential MM.

This evaluation of the potential MM gives the team an indication of the intensity of the efforts necessary to make reaching the target more likely. For example, a potential MM deemed insufficient at the beginning of the program could imply that new organizational means or materials must be put in place by the employer before the worker can resume her tasks.

From the worker's point of view, it is especially her capacities and perceptions that are likely to change during this training period. As for work, the visits continue, and the means for improving the work situation are initially the subject of discussions between the members of the clinical team and the workplace partners.

Based on the analysis of the potential MM indicators, the clinical team needs to consider a number of issues when planning the first therapeutic MM. During this step, the clinician focuses on the work setting, in particular the RTW requirements and the means available to the worker when at work. The clinician also uses the information gathered in step 1 to adequately plan the therapeutic MM.

Creating an initial therapeutic MM is necessary to prepare for the workplace training phase. It is necessary for the worker to be able to accomplish the planned tasks while maintaining her health or, at least, not aggravating the symptoms.

Creating the initial therapeutic MM is thus a prerequisite to Ms. Simon's exposure to work. The workplace is contacted to inform those responsible of what is expected of Ms. Simon at work.

3.5.4 Step 3: Progressive Exposure to Work

This step allows Ms. Simon to begin performing certain target tasks at the workplace, initially accompanied by a member of the clinical team. Ms. Simon has agreed with the clinical team that she will return to work this week, accompanied at various times by a clinician. The planned work schedule is as follows: Monday morning, all day Wednesday, and Friday morning. As agreed between the employer and the clinician, Ms. Simon will perform only the lightest tasks and will have no production quotas to meet. If possible, she will also have a supernumerary status within the work team.

As necessary, temporary or permanent changes to the work situation (e.g., tools, equipment, organization in the work team) will be made to facilitate the progressive return. A clinician will make one or more workplace visits to determine, if appropriate, the permanent changes to be made in order to favor the sustainability of the RTW.

Ms. Simon works the first week according to the agreed-upon conditions and schedule. At several points during the week, she speaks with the clinician who was with her at work. He observes her work activity, asks her questions, and proposes means for facilitating this initial return to work: taking mini-breaks every 15 min, doing neck mobility exercises, and alternating with another packer position where the containers are lighter to handle. All this is discussed beforehand with and approved by the immediate superior, coworkers, and the worker herself.

At the end of the week, a meeting is held to prepare for the following week's work. The clinician asks about the workflow and the worker's impressions, the difficulties encountered, the pain felt, the quality and quantity of the work performed, and the level of satisfaction with the work accomplished. They then agree on a schedule, the tasks to be done, and the modifications to the work situation planned for the next week and to be proposed to her superior.

The first therapeutic MM has been planned to ensure an initial presence at work while minimizing any health risks and achieving a predetermined output level. During her first day at work, the worker benefits from this therapeutic MM, which had been theoretical until it began to be used in an actual work situation. At the end of the first day and of the first week of work, the clinical team will perform an analysis of the therapeutic MM as implemented in order to suggest adjustments for the following work week. The therapeutic MM will be analyzed in light of the observations of the work activity and the discussions with the worker. Analyzing the work's effects on health and output will make it possible to establish the parameters of the second exposure to work while planning a second therapeutic MM. The progression of these therapeutic MMs also takes into account the target to be attained at the end of the 12-week program.

Thus, the clinician will ask the worker a series of questions. For example: Did you notice any symptoms? Did you reach the production target? Were the proposed means and possibilities used? Were they adequate? Effective? The analysis continues. If a health or production problem is reported, the proposed means and possibilities will be revised.

In all cases, this analysis will make it possible to develop a new therapeutic MM for the second week of exposure to work (return to step 3: analysis, adjustment, and creation of the subsequent therapeutic MMs).

When the new MMt is established, the worker will be asked about her perceptions regarding this new therapeutic MM. Does she feel capable of carrying out these tasks? A final adjustment will be made based on the answer to this question, and the proposed tasks and changes to the work setting for the coming week may be submitted for the employer's approval. This second therapeutic MM will then be submitted during her second week at work. Subsequently, repeating step 3 will make it possible to analyze and create a new weekly therapeutic MM, thereby advancing the RTW, and so on until the end-of-program target has been reached.

In cases where it appears impossible to progressively advance the therapeutic MM and tasks performed at the workplace, an adjustment will be carried out by the team together with the partners. If necessary, a new target can be established at that time (e.g., a different position in the company or a definitive reduction in the number of work hours) or another action proposed (e.g., suspending or terminating the program).

Ms. Simon continues with her work rehabilitation program. She now splits her time between days at the clinic, where she continues her training, and days at work. Each week, the therapeutic MM that has been prepared for her enables her to perform the selected tasks and reach the desired output level while minimizing the presence of symptoms. As needed, a clinician can accompany her at work to help her adequately use the proposed means and to facilitate their implementation.

3.5.5 Step 4: End of the Program

Ms. Simon completes the work rehabilitation program in 12 weeks, as planned. During the final weeks, she gradually integrated all her regular work tasks and resumed a full-time schedule while meeting all the production requirements. She also succeeded in managing her symptoms satisfactorily while regaining an adequate recovery capacity. With the approval of her work team, she will continue alternating between two packer positions, spending a half day at each. A seat is also available so that she can vary her postures. A change has been made to the platform on which the palettes are set; it has been fitted with a spring so that the bottles are at a level comfortable for Ms. Simon. Thus, permanent changes have been made in her work situation. At the end of the program, Ms. Simon meets with a clinician for a final evaluation and advice to ensure that her return to work is sustainable.

During this step, all MM indicators will be reviewed in order to prepare a final estimation. Lastly, the clinician will make a judgment on the anticipated sustainability of the RTW and, if necessary, will take actions designed to make it longer-lasting.

This is described as the "final" MM because it is the one that occurs at the end of the program. However, by definition, it remains dynamic, since the parameters that affect it (the work setting and the worker) vary continuously.

3.6 Conclusion

Using the MM concept in planning, a RTW allows for a systematic approach that takes into account the variability of individuals' health and of the work activity. This approach likely reflects the true compatibility, both multifactorial and dynamic, of the worker and the work environment. In addition, it fits with the trend to adopt an early intervention approach and place the worker's regular work at the center of the rehabilitation program. We are currently developing an MM evaluation guide for use in work rehabilitation settings to help clinicians specify the MM indicators, assess them at various points in the RTW process, and integrate the concepts into clinical reasoning. Thus, the MM concept originally developed in ergonomics and based mainly on primary prevention has now become a framework to work rehabilitation and RTW planning.

Although the focus is on workers with MSK disabilities in the context of work rehabilitation, likely this concept could be adapted for individuals suffering from cancer, mental illness, or heart disease. Accordingly, in the coming years, effort will be devoted to adapting our guide to other types of health conditions. Also, the use of MM by an interdisciplinary work rehabilitation team is becoming an integrative force for professionals involved. Indeed, our work has shown that various health disciplines (e.g., occupational therapy, ergonomics, medicine, physiotherapy) can come together while focusing on various dimensions of

MM and share a common vision of worker's functioning at work.

Notably, our research attempts to address the day-to-day needs of clinicians in work rehabilitation. Thus, we have systematized an approach that makes it possible to plan a RTW while taking into account the worker as well as the work situations and interactions between them. However, the question of how to accurately judge the adequacy of the MM approach for ensuring that the worker stays on the job in good health over the long term requires new research, focusing on sustainability of RTW.

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4

Understanding Motivation to Return to Work: The Economy of Gains and Losses

Yunhee Choi, Sali R. Asih, and Peter B. Polatin

4.1 The Concept of Occupational Disability in the Medicolegal Setting

The growing economic and social burden of occupational disability has led to theoretical and empirical efforts to identify potential predictors of refractory disability (Schultz et al. 2007). Medical status is not always congruent with disability status (Robinson et al. 1997). Within the biopsychosocial model, occupational disability is viewed as a complex relationship between physical, psychological, and social/cultural factors (Schultz et al. 2007; Turk and Monarch 2002). For example, some injured workers successfully return to work even before their symptoms resolve fully. Others, with similar injuries, report long-term work incapacity. Failure to return to work is theoretically and operationally equated with occupational disability (Schultz et al. 2007). Rehabilitation programs based on the biopsychosocial model put forth an early return to work as a desirable outcome (Mayer and Gatchel 1988). The longer an injured worker is disabled, the less likely a return to work will occur (Waddell 1992). For example, an injured worker with 2 months of disability has a 70 % probability to return to work; after 6 months of disability, this probability drops to 50 %, after 12 months to 30 %, and after 2 years to 10 %. Therefore, prioritizing the identification of potential return to work barriers within the rehabilitation setting is important (Gatchel 1996; Patel et al. 2007).

Financial compensation is a strong potential barrier to return to work (Theodore et al. 2008); research indicates that individuals on disability compensation benefits have poorer treatment outcomes relative to those without compensation for various types of medical conditions, including so-called railroad worker injury (Sander and Meyers 1986), heterogeneous chronic pain (Hammonds et al. 1978), chronic low back pain (Rainville et al. 1997), closed head injury (Binder and Rohling 1996), crush injury to the foot (Myerson et al. 1994), and whiplash injury (Schrader et al. 1996). In medicolegal settings, a financial compensation issue is considered a *secondary gain* (Fishbain 1994; Gallagher 1994). Other motivational constructs involving gains and losses in the context of occupational disability and return to work are not well understood

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(Fishbain 1994; Gallagher 1994; Schultz 2009). Losses resulting from chronic illness and disability can interfere with an individual's overall future planning, including return to work (Kelley 1998). Losses are usually accompanied by grief (Corey 2008) which interferes with functional ability; grief perpetuates depression, anxiety, and anger and promotes helplessness and hopelessness. These significant issues highlight the importance to identify gains and losses that may reinforce an individual's motivations or behaviors, rather than merely using the pejorative term of secondary gain to explain failure to progress in therapy. This chapter will cover the concepts and economy of *primary*, *secondary*, *and tertiary gain and loss*, which affects an individual's motivation to return to work.

4.2 The Concept of Gains

The term gain itself, which was first described by Freud (1959), implies something beneficial. Freud defined primary gain as "a decrease in anxiety brought about through a defensive operation that had resulted in the production of the symptom of the illness." It was to differentiate from secondary gain: "an interpersonal or social advantage attained by the patient as a consequence of his/her illness." Individuals, healthcare workers, and legal professionals may view gains differently, and the term may have a negative connotation, especially when it becomes a legal concept. Primary gain arises from within the individual; secondary gain is generated by others and received by the individual; tertiary gain occurs when others stand to gain from the perpetuation of the individual's symptoms (Ferrari and Kwan 2001; Kwan et al. 2001). The three types of gain factors (adapted from Dersh et al. 2005; Fishbain 1994; Kwan et al. 2001; Leeman et al. 2000) are presented in Table 4.1.

4.2.1 Primary Gains

Primary gain is achieved when a physical symptom relieves one's feelings of anxiety, ambivalence, or inner conflict. The presence of disability (e.g., limb paralysis, blindness, or chronic pain for which a medical etiology cannot be demonstrated) can be mediated by primary gain and result in a diagnosis of *hysteria*, *conversion disorder*, or *nonorganic chronic pain syndrome* (Dersh et al. 2004). Leeman, Polatin, Gatchel, and Kishino (2000) suggested that symptoms from a primary gain might create a secondary gain. For example, "being disabled" by the symptoms of a conversion disorder allows an individual to avoid certain activities (e.g., return to work) and, at the same time, to receive support from the environment (e.g., financial/emotional support) that otherwise would not be forthcoming.

4.2.2 Secondary Gains

Unlikely primary gains, which arise from within the individual's psyche, secondary gains are more influenced by other factors. Because of its close association with financial gain, it is frequently and erroneously equated with conscious malingering (Fishbain 1994; Gallagher 1994; King 1994). The widespread assumption within the medicolegal context is that "secondary gain = desire for financial compensation = probable malingering" (Dersh et al. 2005; Fishbain 1994) (emphasis added). However, the term *malingering* is more appropriately reserved for the small subset of individuals who deliberately exploit others in order to obtain rewards (Robinson et al. 1997). Leeman et al. (2000) outlined the features of a true malingerer as follows:

- True malingerers frequently have a history of "deviant or maladaptive behaviors" consistent with a diagnosis of sociopathy.
- True malingerers typically pursue their disability claims with a single-minded purpose while keeping the rest of their lives in order. Individuals who are not malingering will have difficulties in almost all aspects of their lives beyond their disability.
- True malingerer will be noncompliant with treatment, although they will attend all disability evaluations, which have the purpose of claim validation.

Table 4.1 A summary table of gains

	Type of gains		
Classification	Primary gain	Secondary gain	Tertiary gain
Agent	Individual	Individual	Family member caregiver Health-care provider
Source	Internal	Internal External	Internal External
Definition	An internal advantage occurring when physical symptom relieves feelings of anxiety, ambivalence, or inner conflict	An interpersonal or social advantage attained as a consequence of being disabled	An advantage derived from individual’s disability by the third party
Examples	Alleviation of anxiety or guilt by the presence of physical symptoms (e.g., limb paralysis, blindness, or chronic pain for which a medical etiology cannot be demonstrated)	*External:* • Financial awards associated with being disabled (e.g., wage replacement, settlement, disability-based debt protection, or subsidized child and family care, housing, and food) • Protection from legal obligations (e.g., child support payments, court appearances, parole, or probation) • Job redirection or vocational retraining (e.g., promotion, transfer, prevention of termination, or skills upgrade) *Internal:* • Gratification of preexisting unresolved needs for dependency • Gratification of preexisting revengeful feelings toward the employer, insurance carriers, or adjustors • Attention from significant others • Providing oneself because of family anger associated with disability • Sympathy and concern from family members and friends • Withdrawing from an undesirable life role or socioemotional role • Communicating in a new way as being disabled • Access to drugs • Holding the spouse in a marriage • Maintaining a status, love, or dominant position in family • Avoiding sex or contraception	*External:* • Financial gains associated with having a disabled family member (family member caregiver) or increased client pool (health-care provider) *Internal:* *Family member caregiver* • Gratification of altruistic needs • Promoting dependency, thus increasing the role/value of the caregiver in the relationship • Receiving sympathy from social networks over the responsibility of taking care of the ill family member • Resolving marital conflicts associated with power in the relationship • Decreasing family tension or conflicts by having more responsibilities related to caregiving or parenting *Health-care provider* • Gratification of altruistic needs • Gratification of sense of righteousness to level the playing field against powerful entities (e.g., the worker’s compensation insurance company) or preexisting revengeful feelings toward the world • For the sake of obtaining admiration and respect from individuals and their support groups • Establishing one’s position as compassionate and pro-individual (e.g., avoiding conflicts with the individual) • Gaining one’s entitlement (e.g., fame or fortune) for dutiful attention to responsibilities • A means to excuse oneself from the effortful position of intellectual honesty • A means to validate one’s own illness of the same type

Table 4.2 Major disability compensation systems in the United States and associated external secondary gain

Disability system	Jurisdiction	External secondary gain factors		
		Financial aspects	Job manipulation	Vocational retraining
State workers' compensation	Most employees	*	*	*
Federal Employees' Compensation Act (FECA)	Federal employees	No	Yes	No
Federal Employee Labor Act (FELA)	Railroad employees	Yes	Yes	No
Jones Act and the US Longshore and Harbor Workers' Compensation Act	Maritime and offshore workers	Yes	No	No
State court system	Personal injury not subject to state worker's compensation system	Yes	No	No
Short- and long-term disability	Those insured by disability policies	Yes	No	Yes
Social Security Disability Insurance	Those who cannot engage in gainful work as a result of a disability	Yes	No	No

Adapted from Leeman et al. 2000; Theodore et al. 2008. Reprinted by permission of the publisher
*Any or all may apply, depending on the particular state

A review of the literature on malingering and disability in individuals with chronic pain identified between 1.25 and 10.4 % as probable malingerers (Fishbain et al. 1999). Limiting the concept of secondary gain to financial motivation may assume that pending litigation or disability compensation for pain-related complaints encourages prolonged disability. Malingering is associated with such terms as "compensation neurosis" or "litigation neurosis" (Bellamy 1997). Miller (1961) felt that individuals improved and returned to work after finalization of their compensation claims and opined that their disabilities were "cured by a verdict." However, follow-up studies have failed to support this view; results were inconsistent and equivocal depending on the individual population and outcome criteria (Mendelson 1982; Swartzman et al. 1996). Favorable treatment outcomes exist even in the presence of unresolved financial secondary gain claims (White 1966). Other psychological, interpersonal, and social factors are often ignored in evaluating an individual's motivation in compensable injuries. The generic belief that compensation perpetuates disability is now accepted as erroneous; Kwan and Friel (2002) suggested that clinicians consider the many other types of secondary gains beyond financial reward.

A new paradigm emerged when Leeman and colleagues (2000) classified secondary gain issues into "external" and "internal" categories (Leeman et al. 2000). External secondary gains are typically related to monetary gain, avoidance of debt, avoidance of legal obligation, and job manipulation issues. The gain can be better understood by reviewing the medicolegal jurisdiction of the individual's case. A list of the most common compensation systems in the United States was provided for enhancing the reader's understanding (Table 4.2).

Whereas external factors can be assessed and addressed within the context of the specific compensation system, internal factors are often more complex because they involve a wide range of interpersonal or psychological motivations for maintaining the "sick role," such as avoiding unpleasant situations (e.g., work, conflict, or unwanted sexual attention) or extending circumstances associated with well-being (e.g., not having to be the disciplinarian in the family or deriving more attention and love).

4.2.3 Tertiary Gains

Originally conceptualized by Dansak (1973), tertiary gain refers to advantages derived from an individual's illness by someone other than the individual. It can be financially driven or motivated by other needs, such as personal values, self-esteem, or even collusion with an individual's belief system. It may include a family member, a service provider, an attorney, or anyone else within the individual's socioeconomic network.

Adopting a caregiving role frequently leads to tertiary gain (Kwan et al. 2001). Not surprisingly, caregiving may derive respect, recognition, professional fulfillment, and/or financial compensation; it is a natural phenomenon within a family system, indicative of compassion and concern, and it may also satisfy an individual's desire to be viewed as an altruist. Caregivers may excuse themselves from other responsibilities, such as an unpleasant work environment. Tertiary gain within a family environment becomes problematic when it interferes with an individual's recovery and work return. Ultimately, malignancy occurs when tertiary gain motivates a caregiver to deliberately sustain illness, encourage disability, and interfere with an individual's recovery (Dersh et al. 2005); within a family system, this enables an individual's disability. Thus, tertiary gain must be aggressively managed. This issue will be discussed at the end of this chapter.

Tertiary gain is observed not only in families but health-care providers; the latter fulfill altruistic needs by providing service for chronically ill individuals, considered also a neutral phenomenon (Kwan et al. 2001). However, when a health-care provider's need conflicts with the individual's best interest, it becomes problematic; for example, when the provider subscribes to a treatment philosophy that is inconsistent with recovery of function and return to work, either out of scientific conviction or from another perspective, such as financial self-interest. A similar scenario may develop with legal professionals, who can encourage protracted disability in the interests of a larger case settlement. Within both the legal and medical professions, standards of practice may sometimes interfere with an individual's return to work for reasons unrelated to dishonesty or lack of ethics.

Overall, awareness of tertiary gain is important, especially in situations of protracted illness and disability. An individual's failure to perform according to expected capability might suggest the influence of a deeper, less explicit influence of secondary and/or tertiary gain issues.

4.3 The Concept of Losses

Separation and death are part of the human experience, but loss is also a broader concept referencing the reduction of resources in which a person is emotionally invested (Harvey 1998). During their lives, people experience many types and magnitudes of losses, which can impact on their daily functioning, psychological well-being, and world view (Harvey 2000). Some losses, such as friends, a partner, or a home, can be replaced. Different magnitudes of loss are experienced, and they subjectively vary from one individual to another. For example, migration to a foreign country may be perceived as a new opportunity and/or a loss of heritage. Loss is seen as consequence of negative events that limit autonomy, precipitate stress, or diminish a sense of self. Illness and disability can result in losses such as decreased income, diminished social networks, and poorer quality of life (Ferrari and Kwan 2001; Gatchel et al. 2002; Gorman 2010). Individuals with chronic disability can lose their self-worth, self-image, autonomy, independence, and aspirations. The magnitude and cascading effect of these losses and the presence of secondary losses along with secondary gains can influence motivation for return to work. The following section will discuss three types of losses and their relation to return to work motivation. The three types of loss (adapted from Ferrari and Kwan 2001; Fishbain 1994; Gorman 2010; Holmes and Rahe 1967; Kelley 1998; Kwan et al. 2001) are presented in Table 4.3.

4.3.1 Primary Losses

Primary loss is defined as *the initial event of loss* (Rando 1988); examples of primary losses are the death of a significant other, job loss, chronic illness, and injury. The magnitude of disruption caused by these losses differs for each individual. Nevertheless, a consensus emerges that life events, such as those involving major disruption and distress, result in a direct personal loss (Holmes and Rahe 1967). In the *Schedule of Recent Experiences* (SRE) and *Social Readjustment Rating Scale* (Holmes and Rahe

Table 4.3 A summary table of losses

Loss	Primary	Secondary	Tertiary
Death of family member, e.g., a parent, a spouse, or a child	✓		
Separation or divorce	✓		
Injury, e.g., personal or at work	✓		
Loss of autonomy, independence, and roles	✓	✓	✓
Loss of self-esteem and self-worth		✓	
Restriction to mobility	✓	✓	
Loss of financial security	✓	✓	✓
Loss of interpersonal relationship, such as relationship with significant others, e.g., family and friend		✓	✓
Anger over disability		✓	✓
Being stigmatized/ marginalized		✓	✓
Relationship restraint with the disabled family member			✓

1967), death is ranked as the first major life disruption, followed by divorce, personal injury or illness, loss of job, and change in financial state. Personal injury or illness leads to disability, which requires adjustment to personal/physical, financial, and social loss. One loss precipitates others, resulting in a vicious cycle of losses, which can reach catastrophic proportions when they influence stress levels, immunosuppression, and neuroendocrine activity (Worzer et al. 2009).

4.3.2 Secondary Losses

Losses which develop as result of primary losses are called secondary losses (Rando 1988). Often, where a primary loss ends and secondary losses begin is ambiguous because one loss can lead to or be initiated by other losses (Worzer et al. 2009), forming a tapestry of loss, grief, and distress. For instance, chronic illness, as a primary loss, results in loss of autonomy, as a secondary loss. However, when considering loss of autonomy as a primary loss, losses of role, dreams, and self-worth as secondary losses emerge. This cascade then perpetuates chronic illness and disability and the ultimate disruption of an individual's life. Consider also that chronic illness causes disability. Next, inability to work results in financial loss and a diminished career; this leads to loss of contact with coworkers and friends and social isolation. Diminished capacity also leads to loss of functioning at home, with decreased autonomy, mobility, and self-esteem. The ultimate results of these changes are anger, guilt, hopelessness, and helplessness. Please see Fig. 4.1.

Anecdotal studies have documented the rippling effects of secondary losses associated with disability (Blackburn 2011; Flor et al. 1987; Holland and Beeson 1993; Kelley 1998; Shapiro 1993; Weiss and Weiss 2001); however, little empirical research has been conducted (Worzer et al. 2009). Ferrari and Kwan (2001) identified several losses resulting from chronic illness and disability. The primary loss of physical functioning can lead to the inability to pursue previous enjoyable activities (Leeman et al. 2000). Disability can lead to the loss of financial stability, resulting from decreased income. The latter leads to diminished capacity to secure something pleasurable, more effort by a partner to regain financial stability, and decreased quality time with family. Clearly, secondary losses are initiated by a primary loss that leads to other secondary losses, infiltrating many domains within an individual's life.

In their article on secondary loss and pain-associated disability, Gatchel et al. (2002) outlined secondary losses pertaining to disability, including relationship and employment loss and secondary depression. Individuals exist within social groups; thus, an incident that affects individuals also impacts their groups. Chronic illness and disability bring changes to interpersonal relationships. Lyons and Sullivan (1998) distinguished between structural and functional losses in relationship. Structural losses refer to tangible effects, such as decreased size of a social network, loss of friendship, decreased time spent together,

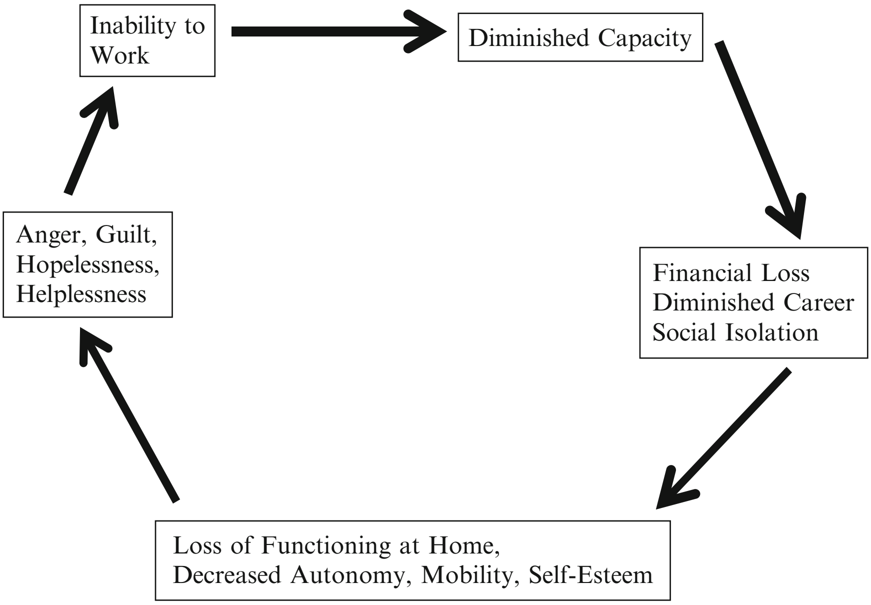

Fig. 4.1 The World Health Organization International Classification of Functioning, Disability, and Health (ICF) Model of Health (WHO 2001)

and divorce. Functional losses refer to changes in the quality of a relationship, such as diminished feeling of togetherness, increased resentment, and frictions between family members.

Chronic illness and disability frequently result in loss of employment. Decreased function impairs individuals' capabilities to perform their jobs and results in loss opportunities for promotion or job loss. This issue can cause a cascade of other losses, such as decreased capacity to earn money (referred to as manifest function) and losses of professional esteem, sense of purpose, and socialization (termed as "latent functions") (Jahoda 1981). When treating individuals with disability, assessing the far-reaching impacts of job loss, which can adversely affect motivation to return to work, is important. Compounded losses cause additional distress and grief to the individual.

Grief is defined as a normal and time-limited reaction to loss, manifested by emotional, behavioral, cognitive, and spiritual reactions (Corr 1998). Grief reactions include anger, guilt, helplessness, sadness, loss of interest, impaired concentration, impaired memory, rumination, withdrawal, and avoidance (Nolen-Hoeksema and Larson 1999; Walter and McCoyd 2009; Worden 2002). These reactions further impair daily functioning. To correct this situation, losses must be understood and acknowledged; grief needs to be resolved for an individual to move on with life (Rando 1988). In situations of chronic illness and disability, individuals may not be able to return to their normal level of functioning and will be reminded of their limitations on a daily basis. Effective coping requires them to move beyond their grief and to maintain a sense of self while adapting to the future (Kelley 1998). To do this, they must construct new goals and find new meaningful activities. Sensitivity to an individual's need for grief work is important to facilitate this therapeutic process. Adapting to the future serves as a motivation to recoup secondary losses, to confront disability, and to return to work.

The impact of unresolved grief can be profound. An individual with a prolonged grief reaction has difficulties with energy, positive emotions, and concentration on the ability to plan and could resort to maladaptive behavior (Bonanno and Field 2001; Horowitz et al. 1980; Stroebe et al. 2001); all could lead to clinical problems. Early identification of clinical problems, such as depression, in an individual with disability is useful because clinical problems affect disease progression (Steptoe 2007). Depression can create a staggering volume of difficulties: prolong suffering from secondary losses and entrenches individuals with more severe and prolonged disability; reinforce disability because of clinical features such as pervasive sad mood, social withdrawal, emotional pessimism, feelings of worthlessness, and suicidal thought (Creed and Dickens 2007; APA 2000); amplify subjective reactions to somatic symptoms; lessen motivation to recover from illness; augment physiological reactivity to somatic symptoms; reduce the general capacity to cope with physical illness; decrease energy and cognitive capacity; affect regulation; and subjectively impact feelings of worthlessness and social stigmatization (Katon and Sullivan 1990; Kessler et al. 2003). Antidepressant medication and cognitive–behavioral therapy are integral components of rehabilitation for individuals with depression.

4.3.3 Tertiary Losses

Tertiary loss is defined as a loss linked to the individual's illness; however, this loss is experienced by an individual other than the individual (Kwan et al. 2001). Examples of tertiary loss are financial hardship, loss of a partner, and increased responsibilities. Other family members, especially the main caregiver and the spouse, typically experience tertiary loss; this loss can take a toll on all family members. For example, if the sole breadwinner develops a chronic illness and is unable to work, the partner joins the workforce to earn money. This issue results in a role shift creates more demands for them to assume a caretaking role, to the detriment of other pleasurable activities, and it also impacts the children, because it involves less quality time spent with parents. Families with a disabled member experience higher stress levels, lower well-being, and decreased relationship satisfaction (Cano et al. 2008; Green and King 2007; Monin and Schulz 2009; Sidell 1997).

4.4 The Economy of Gains and Losses

A clear awareness of the complex balance between gains and losses is essential for understanding the motivation to return to work. Bayer (1985) illustrated how complicated some of these cases can be. For example, an individual may receive some financial compensation for the disability, but the amount does not reach the previous salary level; this situation is actually a loss rather than a gain. Another individual may receive additional attention from family and health-care providers, but this support is given reluctantly, worsening the individual's already high level of emotional distress.

Fishbain (1994) elaborated on the economy of gains and losses based upon unconscious–conscious continuum issues, claiming that the presence of gains must be associated with unconscious motivation. In three case studies, he identified theoretical and practical problems in understanding the unconscious motivation for individuals' behaviors. Specifically for secondary gains, as a part of the process of operationalization, the term "secondary gain behaviors or perceptions" was introduced; it was defined as individual and nonindividual behaviors or perceptions that appear as if the individual is consciously seeking some form of gain, because of unclear or over inferred unconscious motivation. Kwan and Friel (2002) suggested that cognitive psychology theory informs the understanding of the economy of gains and losses. They proposed that the economy of secondary gain could occur at a preconscious level (outside of one's awareness), and the disability behaviors would be chosen based on the individual's decision to pursue the gains. They highlighted the role of social factors in explaining why some individuals seek secondary gain even when disability brings significant losses. They argued that where societies that view psychological illness is unacceptable, individuals assume a more socially acceptable disability based upon physical illness (Kwan and Friel 2002). Therefore, gains and losses revolve around disability syndromes, such as chronic low back pain, whiplash syndrome, fibromyalgia, chronic fatigue syndrome, myalgic encephalitis, chronic temporomandibular disorders, repetitive strain injury, multiple chemical sensitivities, sick building syndrome, Gulf War syndrome, and silicon breast implant toxicity.

The awareness of possible secondary and tertiary gains and losses is essential in understanding the motivation to return to work and the management of disability in a medicolegal context. Secondary and tertiary losses can either perpetuate or lessen the disability, depending on how they balance out. Perceived secondary and tertiary losses that outweigh the gains might motivate an individual to overcome physical and emotional difficulties and to return to work. Conversely, secondary and tertiary losses might perpetuate disability when those losses heighten feelings of helplessness and hopelessness, motivating an individual to adopt the role of victim. An individual's motivation to return to work is assumed to increase as secondary losses outweigh secondary gains; it decreases when secondary gains outweigh secondary losses (Dersh et al. 2005; Worzer et al. 2009). However, individuals who believe that their losses from illness and disability are excessive may be motivated to recoup that loss by remaining disabled, in the hopes of getting a financial settlement. It is difficult to apply simple rules to a complicated human problem.

Furthermore, the view of gains and losses can be different depending on different observers (e.g., individuals, families, attorneys, clinicians, and insurance companies). For example, the decision not to return to work because of stress on the job can be one of the internal secondary gains (i.e., elimination of job stress) from the individual's perspective. However, this decision can be viewed as the tertiary loss by a caregiver or clinician, who is attempting to facilitate the individual's return to work.

4.5 Management of Secondary Gains and Losses

To attempt to resolve a case of failure to return to work as expected requires a full understanding of the balance of gains and losses. Often, these issues are not clearly understood by the individual, family, or even the health-care providers. In identification, importance is placed on applying the biopsychosocial model and looking for clinically significant symptoms and behaviors: delayed recovery, somatization, symptom magnification, pain behaviors, depression, and factitious behaviors (Leeman et al. 2000).

What should a clinician do when the above symptoms are observed? Firstly, identify the unique gains and losses associated and to use them to explain the dynamic of decreased motivation for work return. Next, help the individual to gain insight into the balance of his/her gains and losses and their impact on motivation; insight does not equate to the individual acknowledging his/her problems. Denial or minimization might be motivated by several factors: a sense of being overwhelmed, anxiety about facing deeper and more disturbing problems, fear of change, a desire to avoid further disappointment, and/or hopelessness and helplessness. A compassionate but firm and structured intervention approach must be used to deal with significant loss, as well as frequently associated chronic pain and depression. Below are some techniques for managing secondary gain and loss (Leeman et al. 2000) in the clinical setting.

4.5.1 Establish Rapport and Trust

Rapport is an essential part of the therapeutic relationship (Corey 2008). It will determine:

- The openness and honesty with which an individual is willing to reveal self
- Willingness to commit to a treatment plan encompassing the goals of recovery and return to work
- The ability of the health-care provider to fully understand the individual determinants of the individual's disability

Building rapport is achieved through active listening. The physician must assume several roles in order to build trust: expert, logisitic/

social support, individual advocate, and accountability monitor (i.e. demanding something back from the individual) (Leeman et al. 2000). The treating physician can reasonably expect compliance with stipulated and agreed-upon treatment goals, including drawing up a therapeutic contract with the individual where needed.

4.5.2 Involve a Disability Case Manager

A properly trained disability case manager understands the concepts of gains and losses and is also familiar with the various disability systems and environments that influence these factors.

4.5.3 Contain Financial Secondary Gain

Helping an individual to become aware of the short- and long-term financial consequence of disability is important. In some cases, the individual has one or more misconceptions that motivate behavior; when encouraged to examine personal behaviors that are against self-interest, openness to change will emerge. There are several steps to contain this particular gain:

- **Follow the money and do the math**. Analyze the current, potential, or perceived sources of disability-based income. This path usually points to return to work as the better financial option and dispels illusions about a "pot of gold" at the end of disability rainbow.
- **Distinguish impairment from disability**:
  - An individual whose case falls under an impairment-based system needs to know that the monetary reward will have little to do with his/her functional abilities and pain and that, therefore, progress toward recovery will have no impact on the impairment assessment.
  - An individual whose case falls under a disability-based system may be compensated differently depending on the type of job previously held and previous wage; in addition, professional options about work capacity, pain, and suffering may be taken into account. The individual needs to understand the previously mentioned treatment contract.
- **Medical documentation in exchange for medical compliance.**
- **The "pain behavior" talk.** Explain to the individual that pain levels are documented in the medical record, therefore eliminating exaggerated behaviors is critical: these behaviors accomplish nothing and may be interpreted negatively as conscious symptom exaggeration and, therefore, malingering.
- **Incorporate vocational planning.** This intervention includes exploring as many as vocational options as possible. Then, a specific vocational plan is jointly determined, executed, and followed up with the individual over 6 months or 1 year.
- **Employ multimodal disability management.** Employing an interdisciplinary treatment model is essential in capturing the multifaceted aspects of disability. The model is termed "biopsychosocial," and it needs to address not only the disease process but also the psychological issues related to disability, such as depression, anger, anxiety, sadness, guilt, loss, grief, hopelessness, and helplessness. Helping an individual to work through grief is beneficial because it ultimately strengthens positive coping as a resolution to the losses. In the end, an individual is expected to create cohesive picture which emphasizes adaptation and moving "forward" (Bruce and Schultz 2001). Psychotherapy and psychopharmacology should be utilized when the disability experience is associated with comorbid psychopathological disorders, such as depression, anxiety, substance abuse, or dysfunctional coping (as manifested, e.g., in a personality disorder) (Kring 2009).

Disability does not happen in vacuum. The "significant others" in an individual's life are most commonly family but may also include healthcare providers, attorneys, friends, insurance companies, and even the Internet. Understanding the dynamics within the family is particularly important. Treating disability requires an integration of case management, counseling, and rehabilitation to (Nichols 2010):

- Educate
- Problem solve
- Strengthen positive coping skills
- Support healthy goals
- Identify dysfunctional relationships
- Facilitate conflict resolution

4.6 Conclusion

Understanding motivational factors from secondary gains and losses perspective is of critical importance in conceptualization of how impairment relates to disability. Research and clinical case formulations and unpacking and operationalizing the construct of secondary gains should be balanced by appropriate attention to secondary losses.

As noted by Dersh et al. (2005), applications of this new approach in practice can be challenging due to (1) the clinician's methodological difficulties in identification of gains and losses, (2) complications inherent in the clinical inference process due to individual's unconscious motivations and conscious hidden agendas, and (3) lack of guarantee that gains and losses can be successfully managed by a clinician. Notably, reinforcement contingencies in the individual's social environment may have a more significant impact on his/her motivation than a clinician.

Last but not least, the clinician's own biases toward over-perceiving or under-perceiving individual's various losses need to be carefully self-identified, addressed, and monitored.

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The Importance of Workplace Social Relations in the Return to Work Process: A Missing Piece in the Return to Work Puzzle?

5

Åsa Tjulin and Ellen MacEachen

5.1 Introduction

The chapter elaborates how workplace social relations influence practice in the return to work process. The social conditions in which the return to work process is embedded, and the way in which social interaction and relations between the sick-listed worker and other workplace actors (supervisor and coworkers) evolve, have only been researched to a limited extent. In this book chapter, we will discuss critical new dimensions of social relations research in the field of return to work that can "make" or "break" a workplace return to work process. These critical new dimensions highlight the importance of viewing the return to work situation as a dynamic process over time, where supervisors and coworkers display shifting roles depending on phases of the process. The chapter conveys new dimensions of social relations, acknowledging the positive contribution of coworker efforts in the process, which may have an important impact on workplace-based return to work interventions.

5.2 Workplace Social Relations in the Return to Work Process: What Do We Know?

This section provides a literature review of social relations in research on the return to work process. The literature review begins with a discussion about conceptual models of return to work, followed by return to work determinants acknowledged in previous research, focusing on social relations in particular.

5.2.1 Return to Work Conceptual Models

In searching for a more comprehensive understanding of the return to work process, there has been a shift from biomedical to biopsychosocial and ecological models of return to work and disability management research (Schultz et al. 2007). The biopsychosocial model was one of the first to integrate a biomedical and social perspective (Schultz 2008). In this model, the return to work process is viewed as an interaction among biosocial, psychosocial and social prerequisites for an individual's work ability (Waddell and

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Burton 2005). However, this model has been criticised as being too theoretical and failing to capture the subtleties of social relations and interactions in the return to work process, since the social factors are not specific enough for systematic empirical validation (Schultz et al. 2007). The model also fails to recognise the relation between the individual and the workplace and takes no consideration of larger structural aspects such as economic, legal or policy issues (Costa-Black et al. 2011; Loisel 2009).

The ecological/case management models are similar to the biopsychosocial model. Results of a large study conducted in Canada during the late 1990s (Loisel et al. 1997) led to the development of the Sherbrooke disability prevention model, which incorporated the biopsychosocial model and symbolised a shift from personal disease/biomedical models towards person/environment models within return to work (Loisel 2009). Responsibility for outcomes shifted from the healthcare provider–patient relationship to a multiplayer decision-making system influenced by different professional, legal, administrative and cultural (societal) interactions (Loisel et al. 2005a, b). The underlying idea is that return to work has multi-determinants impacting the process and should be understood in a systematic context, which considers the interplay between the *macro*-system (societal context, culture and politics), the *meso*-system (workplace, healthcare, legislative and insurance system) and the *micro*-system (the worker). The model also highlights the fact that several stakeholders are involved, each with their own understanding of return to work and expected outcomes (Schultz et al. 2007). Please see Fig. 5.1.

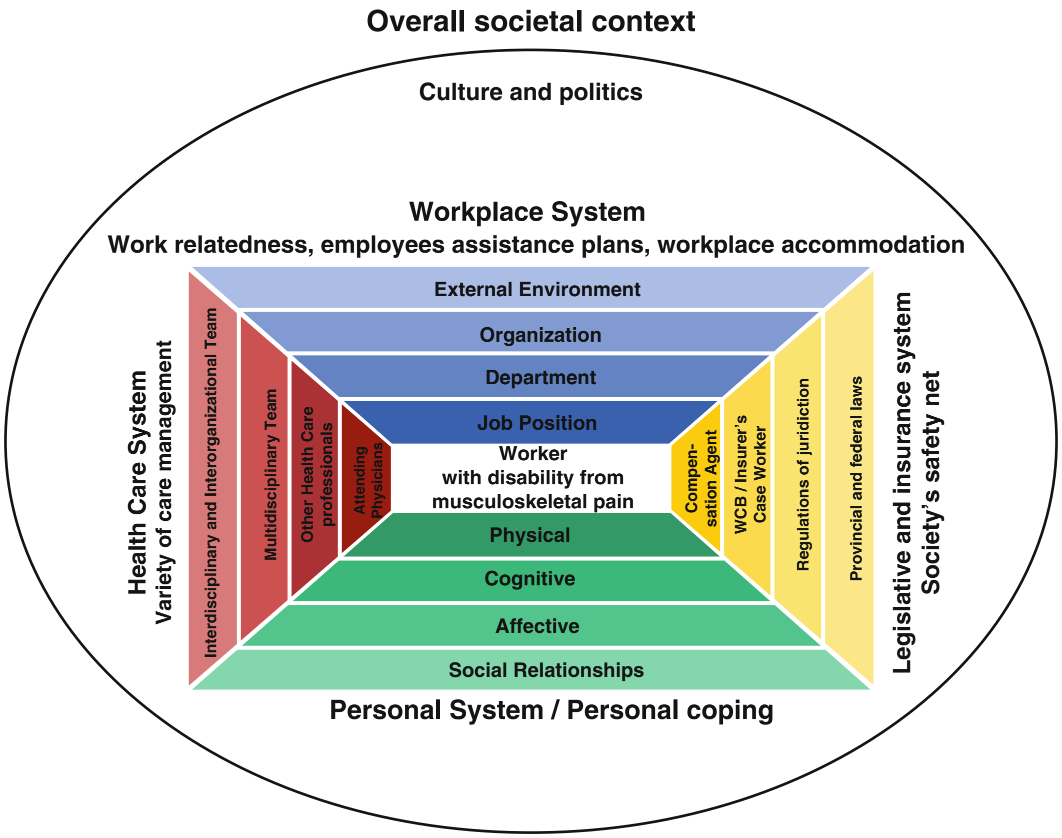

Fig. 5.1 The Sherbrooke model or the ecological/case management model (Loisel et al. 2005a, b)

Although the biopsychosocial and ecological/case management models of return to work are emphasised in the literature (Loisel 2009; Schultz et al. 2007; Waddell and Burton 2005), studies show how complex it is for stakeholders and workplace actors to apply the models in everyday practice (Eakin 1992; MacEachen et al. 2010, 2012; Ståhl 2010). Research results of the Sherbrooke model provide a way of structuring different systems and acknowledge stakeholders involved in the return to work process. However, return to work models vary widely and depend upon compensation systems and stakeholders' interests, definitions and conceptual approaches and desired outcomes (Linton et al. 2005; Pransky et al. 2005; Young et al. 2005a, b). There is a fundamental difference in the way in which the model is applied by different stakeholders, including workplace actors, depending on the sociopolitical system in which the model is used (Ståhl 2010). Thus, the interplay among the different systems and stakeholders (healthcare, legislative and insurance, workplace and personal systems) of the Sherbrooke model creates marked consequences when applied. Furthermore, the Sherbrooke model needs to be elaborated to facilitate understanding of how the interaction within and between the key system components and stakeholders hinders or facilitates the return to work process, especially in relation to the sick-listed worker (Schultz et al. 2007).

These conceptual models advocate that the individual worker's work ability should be assessed in relation to personal/psychological and social/occupational prerequisites and the interaction between these when performing ordinary workplace tasks (Försäkringskassan 2010; Hetzler 2003). During the development of different return to work models, starting with the biopsychosocial and the International Classification of Functioning (ICF), the role of the workplace has been increasingly clarified, as in the Institute of Medicine (IOM) model and the Sherbrooke model (Costa-Black et al. 2011). What seems to be missing in the models is acknowledgement of changes in roles and needs of different workplace actors in the return to work process.

5.2.2 Determinants in the Return to Work Process

Research studies exist that imply the importance of social relations at the workplace (Baril et al. 2003; Eakin 1992; Eakin and MacEachen 1998; Eakin et al. 2003; MacEachen et al. 2006; Ekbladh et al. 2010; Svensson and Bjorklund 2010). However, to date, workplace return to work research has primarily focused on physical and psychological conditions that facilitate return to work from the perspectives of the sick-listed worker and/or the supervisor (Holmgren and Dahlin Ivanoff 2004, 2007; Shaw et al. 2003) with only minor attention to workplace social relations.

5.2.2.1 Personal Determinants for Return to Work

Several studies have been conducted to understand the factors behind the worker's efforts in the return to work process. These factors are often mentioned as individual work disability determinants, psychosocial or behavioural factors that impact a worker's decision whether to return to work (De Rijk et al. 2009; Loisel 2009; Shaw and Huang 2005). As far as re-entering workers are concerned, motivating factors for the return to work process include protection of their financial security; staying healthy and not having setbacks in their return to work efforts (Franche and Krause 2002); preserving their dignity when re-entering the workplace as a worker; being counted on when performing the work tasks, i.e. preventing feelings of job insecurity; and being respected for the fact that they still have health problems, i.e. perceiving trust and legitimacy for their health condition (Franche et al. 2005a, b; Franche and Krause 2002; MacEachen et al. 2006, 2012). Studies often mention fear avoidance and pain (Hoogendoorn et al. 2000; Linton 2000; Pincus et al. 2002; Waddell et al. 1993), satisfaction with treatment and reassurance regarding diagnosis and recovery (Verbeek et al. 2004) and involvement in decision-making and communication with healthcare services (Deyo and Diehl 1986) and the workplace (Franche and Krause 2002;

Shaw and Huang 2005) as being important for the worker's decision to return. Recovery expectations (Reme et al. 2009), motivation and intentions to return to work (De Rijk et al. 2009), self-efficacy (Brouwer et al. 2009; Franche and Krause 2002; Shaw and Huang 2005), perception of fairness (Hepburn et al. 2010) and social support (Shaw and Huang 2005; Young 2010b) are also considered as predictors for the re-entering worker's health recovery and ability to resume and sustain the ability at work.

Recent studies acknowledge that individual efforts to re-enter work cannot be studied in isolation from compensation systems, healthcare services or the workplace (Franche et al. 2005a, b; Loisel et al. 2005a, b; MacEachen et al. 2012; Young et al. 2005a, b). Studies related to facilitating patient satisfaction in the return to work process have shown the importance of communication between the healthcare giver and the re-entering worker (Verbeek et al. 2004). The importance of communication between healthcare services and the workplace has also been acknowledged (Franche et al. 2005a, b; Franche and Krause 2002; Shaw and Huang 2005) as has coordination with insurer requirements (Kosny et al. 2011). For the re-entering worker, communication needs to include discussion of the realistic potential for sustainability of their work ability, including identification of possible interventions for avoiding setbacks when re-entering the workplace (Shaw and Huang 2005; Young et al. 2005a, b).

Knowledge gaps exist about how psychosocial factors actually play out in return to work, especially when viewing the process as a dynamic trajectory over time. The re-entry to work may involve temporal shifts in disability, in the disability-related beliefs and behaviours of the re-entering worker (Brouwer et al. 2009; De Rijk et al. 2009; Franche and Krause 2002; Kuijer et al. 2006; Shaw and Huang 2005; Young et al. 2005a, b).

5.2.2.2 Workplace Determinants for Return to Work

It is now outdated to view the return to work process as strictly a problem that concerns individual employees. Rather, there is now an increased emphasis on research into workplace and organisational factors and their influence on the return to work process (Shrey 2000). However, the impact of the workplace has been researched to a limited extent, even though the workplace and the worker's supervisor play significant roles in the return to work process (Holmgren and Dahlin Ivanoff 2007; Loisel et al. 1997; Shaw et al. 2006, 2003). Several systematic reviews have been conducted on workplace-based return to work interventions, primarily aimed at interventions for re-entering workers with musculoskeletal disorders (Briand et al. 2008; Carroll et al. 2010; Franche et al. 2005b; MacEachen et al. 2006; Van Oostrom et al. 2009). Review results show that there are several interventions that could facilitate the return to work process.

At the individual–workplace interface, it is suggested that the return to work process is facilitated by early contact between the employer and the re-entering worker (Franche et al. 2005a, b). Early return to work is considered a win–win situation for both employer and re-entering worker. The employer has invested in the worker's competence and thereby has an economic interest in getting the worker back early (Försäkringskassan 2009), and the re-entering worker avoids a drop in income as a result of sickness absence if the return can be managed early on (NHS 2009). However, few studies have been conducted so far concerning early social contact, and there is limited research on the actual utility of early contact as a strategy (Franche et al. 2005a, b). Little is known about the essential meaning of early contact for workplace actors, how workplace actors carry out early contact and if early contact is health promoting.

Studies have shown that continuous contact with the supervisor and coworkers during absence is experienced as supportive by the re-entering worker (Baril et al. 2003; Holmgren and Dahlin Ivanoff 2004; Nordqvist et al. 2003), although whether early contact is perceived as welcoming or as harassment by the re-entering worker depends on the atmosphere at the workplace (Baril et al. 2003; Eakin et al. 2003). Early contact can be perceived as an unwelcome obligation for both the employer and the sick-listed worker if it is experienced as a pressure or a non-supportive intervention (MacEachen et al. 2006). Studies in several studies emphasise early contact as a strategy and responsibility for employers in facilitating early return to work. However, a knowledge gap remains (Försäkringskassan 2009; NHS 2009; WorkCover 2003; WSIB 2009) about how to manage early contact and how this contact is experienced by key actors at the workplace (Franche et al. 2005a, b; MacEachen et al. 2006).

Workplace-based interventions such as ability-based accommodations (Krause et al. 1998; Shaw et al. 2003) and adapted workplace training (Shrey 2000) are prompted in research, as is the presence of a return to work coordinator (Franche et al. 2005a, b; Shaw et al. 2008) and communication between the healthcare system and the workplace (Franche and Krause 2002). However, there is no evidence of the effectiveness of the interventions in reducing sickness absence (Van Oostrom et al. 2009). Qualitative research conducted in Canada and Sweden has shown that work accommodations and adaptations have to match the worker's ability to be effective; otherwise, the work environment and tasks can contribute to a setback in the return to work process (Eakin et al. 2003; Larsson and Gard 2003). The return to work process is a socially fragile process, where both coworkers and supervisors play a part.

At the organisational level, it can be beneficial if the employer incorporates policy and support programmes in the return to work process (Baril et al. 2003; Holmgren and Dahlin Ivanoff 2007; Shrey 2000), especially if supervisors are trained to completely manage the process with legitimacy, participation and interest in the re-entering worker's situation (Franche et al. 2005a, b; MacEachen et al. 2006). However, implementation of workplace-based interventions has proved to be difficult, since research-based recommendations are seldom precise and not always of immediate practical use (Loisel et al. 2005a, b). Several workplace actors play an important active part in return to work implementation with the outcome dependent on the interests of these actors (Walt 1994). For instance, if management neglects to include supervisors in the design and planning of a return to work intervention, the intervention may become difficult to adopt (Gardner 2000).

A systematic review shows that when considering different types of work disability disorders, it cannot be concluded that workplace interventions are more effective than usual care. This may be due to workplace interventions that focus more on changing and improving the individual's prerequisites for return to work than on making changes in the work environment and organisation (Van Oostrom et al. 2009). The mere involvement of the workplace in the return to work process does not necessarily facilitate re-entry for the worker (Carroll et al. 2010). Workplace actors need to actually take action in order to facilitate changes at the workplace (Briand et al. 2008). Nevertheless, the most common workplace interventions are directed towards stress management, retraining in work tasks and accommodations made at the workplace to help the worker adjust to work task requirements (Briand et al. 2008).

5.2.2.3 Workplace Social Relations in Particular

In return to work legislation, policies and practice, a successful return to work is defined as a restoration of pre-work ability and returning to the same workplace as prior to sick leave (Briand et al. 2008; Carroll et al. 2010; Van Oostrom et al. 2009). This leaves unanswered questions about what a successful return to work might involve, including how to match work accommodation with the worker's work ability and tasks (Young et al. 2005a, b) and how re-entry influences social interactions and relations at the workplace. As mentioned earlier, psychosocial factors often impact a worker's decision about whether to return to work. A recent study aimed at developing instruments to assess motivational determinants for return to work questioned viewing motivation as a solely personal attribute. Rather, motivation should be regarded as a reflection of the relationship between the re-entering worker, several key stakeholders and workplace actors in the return to work process. If motivation is regarded as only an individual attribute, leaving the social context unseen, this may have moral implications for how the sick-listed worker is perceived, resulting in a “blame the victim” mentality (De Rijk et al. 2009).

Some studies about social relations in workgroups have shown that workplace conditions and social relations, attitudes and beliefs play a part in the success of the return to work process (Baril et al. 2003; Eakin and MacEachen 1998; Eakin et al. 2003; Friesen et al. 2001). For instance, tensions may arise if the re-entering worker cannot produce according to quotas or if modified work leads to an increased workload for coworkers (Baril et al. 2003; Eakin et al. 2003; Larsson and Gard 2003). These results imply that social context does matter. Recent qualitative studies conducted in Canada and the United States have shown that re-entering workers found their coworkers supportive in the return to work process (Lysaght and Larmour-Trode 2008; Young 2010b) and that this support contributed to helping the worker stay at work (Young 2010b). Emotional support, such as demonstrating caring, interest, encouragement and trust, seemed to be of special importance (Lysaght and Larmour-Trode 2008). A quantitative study from Switzerland found that social support depended on the closeness of relations between the coworker and the injured worker and may prompt the worker to speak up about return to work problems (Elfering et al. 2002). Due to its potential impact on return to work efforts, it is important to further investigate how social support is played out in the return to work process (Lysaght and Larmour-Trode 2008).

In summary, research shows that social relations and interaction must be considered when assessing workplace-based return to work measures. Several studies have been conducted on workplace-based interventions in the return to work process. However, few have investigated how workplace actors (supervisors, coworkers and re-entering workers) experience specific return to work processes at the workplace. Thus, the return to work process is not solely concerned with worker beliefs and decisions in the process but is also related to social interaction with other stakeholders (Loisel et al. 2005a, b) and workplace actors (Bellaby 1990; Eakin and MacEachen 1998; Eakin et al. 2003; Gates 2000; MacEachen et al. 2006). Workplace-based intervention studies described in several reviews (Briand et al. 2008; Carroll et al. 2010; Franche et al. 2005a, b; Van Oostrom et al. 2009) do not take into account temporal shifts or phases of the return to work process. Recurrence in the return to work process, or the question of sustainable work ability, is an emerging topic under discussion, since a first return to work does not necessarily mean that the re-entering worker manages to stay at work (Young et al. 2005a, b).

5.3 Workplace Social Relations in the Return to Work Process: A Piece in the Return to Work Puzzle?

In this section, our own research will serve as an example of how social relations play an important part in the return to work process. Our study elaborates upon the dynamics of social relations, which are explained using a model of social organisation of return to work, along with additional study findings.

5.3.1 Study Design

To further understand dynamics of workplace social relations in the return to work process, an exploratory qualitative study was conducted in Sweden with data collection during 2008. To our knowledge, no prior study had a primary focus on how workplace actors (supervisors, coworkers and workers) within single workplaces experience social relations in the return to work process and the interrelationship among these key workplace actors. Studies of social relations of return to work have generally focused only on sick-listed workers and/or on workplace supervisors or on both players but in different workplaces.

Three employers within the public sector were selected for the study. Within these workplaces, seven work units were purposively selected (Table 5.1). A work unit was defined as a discrete

Table 5.1 Sample

Work unit	Diagnosis	Period on sick leave	Return to work (%)[a]	Re-entered worker[b]	Coworkers	Supervisor	Human resource manager
Fire station	Mental health	6 months	100	1 M	2 M	1 M	1 F
Day care	Mental health, musculoskeletal	6 months	75	1 F	2 F	1 F	
School	Mental health, cancer, stroke	5 years and 6 months	25	1 F	2 F, 1 M	1 F	
Administration	Musculoskeletal	2 months	100	1 F	2 F		1 F
Day care/ school	Mental health	2 years and 7 months	100	1 F	2 F, 1 M	1 F	
Home care	Musculoskeletal	1 year and 6 months	25	1 F	3 F	1 F	
Home care	Musculoskeletal	1 year and 6 months	75	1 F	3 F	1 F	

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[a] According to Swedish regulations, an individual can return from sick leave and work 25, 50, 75 or 100 %

[b] *M* male, *F* female

department with a supervisor and group of workers. The main criterion for selection was that the workers should have direct experience of a return to work process (Patton 2002). The criteria for inclusion were based on having experience of a recent return to work process, and that the sick-listed worker had been absent for at least a month. The participants were recruited within 3 months of the sick-listed worker's re-entry to the workplace.

In total, 33 individual open-ended interviews were conducted across the seven work units. At each single work unit, interviews were conducted with the re-entering worker, 2–3 coworkers and the person(s) who had the delegated responsibility for return to work (supervisor and/or human resource manager). In addition to the interviews, organisational policies regarding return to work were collected to contextualise the interviews and frame the understanding of coworker experiences in different organisational settings.

A grounded theory approach was used, based on the idea that theoretical concepts should be grounded in the intersubjective reality of the social world (Locke 2001). The process of generating theory, or models, emerges from systematic comparative analysis and is grounded in fieldwork to explain what has been observed (Patton 2002).

The methods and the data are described in detail elsewhere (Tjulin et al. 2010, 2011a, b). In this chapter, a review of the findings is provided to further expand the knowledge base about the social interaction and relations among different workplace parties during the return to work process and how this can affect the success of the return to work process. The findings are also discussed in light of other research studies conducted in the field of return to work research.

5.3.2 Study Findings: The Social Organisation of Return to Work

Our research study provided a general model of how social relations affect return to work (named *the model of social organisation of return to work*). The model explains how workplace actors' roles and experiences affect the return to work process, and how time phases relate to social relations/interaction at the workplace (Tjulin et al. 2010). Please see Fig. 5.2.

The workplace actors (re-entering worker, coworkers and supervisor/human resources manager) experienced the return to work process as phases (when on sick leave, when re-entering the

	OFF WORK	**BACK TO WORK**	**SUSTAINABILITY**
RTW POLICY	Policy guidance	Policy guidance	Lack of policy guidance
Supervisor **SOCIAL RELATION** Co-workers	Responsibility Brotherly feeling	Responsibility Helping hand	Letting go Goodwill
SOCIAL POLICY & NORMS	Social responsibility	Social responsibility	Workplace loyalty

Fig. 5.2 The social organisation of return to work

workplace and future sustainability) with shifting demands and expectations. The model of social organisation illustrates how organisational policy guidance, workplace social relations and social policy shift during these three phases, with workplace actors playing varyingly prominent roles.

Supervisors generally described the return to work process as starting off with a return to work responsibility and ending when the sick-listed worker returned to the workplace. Supervisor responsibility for the return to work process is described in the organisational policies. However, these policies offered little advice on how to handle the phase of sustainability, i.e. when the worker was back at the workplace. At this point, supervisors "leave it" up to the coworkers to make the day-to-day activities work.

The coworkers viewed their efforts as a positive contribution during each phase of the return to work process, beginning with a "brotherly" perspective when a colleague fell ill, then shifting to a "helping hand" to coordinate the return and finally a "goodwill" relationship once the worker was back at the workplace. Coworkers were guided through the return to work process by their social responsibility and workplace loyalty rather than organisational return to work policies.

However, in each phase there were uncertainties about how to proceed. The workplace actors were unsure about how, in day-to-day working life, they were expected to or able to carry out certain return to work practices such as accommodations or early contact with the re-entering worker. The concepts of uncertainty and invisibility showed a shift in the dynamics of social relations during different phases and how return to work policies were formulated. Uncertainty stood out most strongly in relation to the luminal period before the person returned (early contact) and the indistinct period following the time of return (sustainability). The key findings from the study will be further displayed by highlighting each phase of the return to work process as experienced by the workplace actors.

5.3.2.1 The Off-Work Phase

The findings showed that supervisors viewed early contact as part of their supervisory responsibility for the return to work process. They made early contact in accordance with organisational policy. However, one supervisor questioned whether it was advisable for a workplace to have a pre-set strategy for who should initiate the contact. The supervisor might not have been best suited for making contact, since early contact was dependent on the type of illness the re-entering worker had, the closeness of relationship between the re-entering worker and the supervisor and the personality of the worker. Instead, coworkers were mentioned as facilitating contact, since they worked most closely with the re-entering worker and had a more detailed understanding of daily workplace activities.

However, findings showed that coworkers sometimes felt uncomfortable and uncertain about appropriateness of early contact, especially if early contact was regulated by a schedule or a set workplace agreement. Instead, coworkers had different incentives for making contact and felt that coworkers who already had a social relationship with the re-entering worker should make the contact. There was also a balancing act to play during the early contact. Coworkers wanted the sick-listed worker to feel "well thought of" and to show their concern; at the same time, they felt uncomfortable infringing on the personal space of the sick-listed worker.

This example of workplace actors being governed by social relations at the workplace illustrates that these relations cannot be reduced to routine acts by policies or return to work models. Sickness absence changed the roles of coworkers, which meant that the function of the workgroup also needed to be considered.

5.3.2.2 The Back-to-Work Phase

In the back-to-work phase, the idea that work-task accommodation can erase the impact and presence of the disability does not acknowledge the social and psychological impact the return to work process has on workplace relations. This was especially true in situations when the re-entering worker was not fully recovered and in workgroups where the supervisor took on a less prominent role, resulting in coworkers' managing day-to-day activities without any formal policy or assistance from the supervisor. Coworkers relied on their own or relatives/friends' experiences of sickness, tackling return to work issues in an unplanned manner by trying to do what was required to "make it work" for themselves and the re-entering worker, such as offering strategic support or re-organising schedules. These efforts were not always visible in the supervisor's account of the return to work situation. When communication within the workgroup and between the workgroup and the supervisor was implicit, with the assumption that return to work was a self-evident situation that did not require open discussion, it caused anxiety and uncertainty about how to encounter the re-entering worker and appropriate expectations.

Supervisors experienced challenges in communication with other stakeholders involved in the back-to-work phase of the return, especially regarding workplace accommodations. In one instance, an occupational health therapist suggested lighter duties, but the supervisor said this was not possible due to work demands, which raised questions about whether collaborative return to work advice fitting with practical workplace realities.

5.3.2.3 The Sustainability Phase

Even though organisational return to work policies guided supervisors in the return to work process, the policies did not cover issues regarding the sustainability phase at the workplace. Policy guidance ended when the re-entering worker had returned to work. The informal way the supervisors managed the sustainability phase led to feelings of uncertainty in the workgroup about how the workgroup could collectively prevent setbacks in health. Findings showed that coworkers had concerns about how the sustainability phase was managed by the supervisors.

Across work units, there were tensions between the coworkers' views of how much the supervisor needed to do during the return to work process and the supervisor's own views of the supervisory role. Supervisors seemed to focus on getting the person back but not so much on what happened afterwards or on the daily accommodation needs of the worker. This intervention appeared to be informally left to coworkers, with sustainability relying on coworkers' goodwill for accommodations. Our findings suggest that the "goodwill" of coworker efforts could not go on for an extended period of time, losing impact if they were not acknowledged and discussed with the supervisor and within the workgroup.

5.4 Social Relations: Another Piece in the Return to Work Puzzle

In this section, we discuss the critical dynamics of workplace social relations in the return to work process, starting with an elaboration of the role of the supervisor, followed by the contribution of coworkers, early contact, accommodation and communication. These critical dynamics are considered in light of previous research on the impact of social relations with respect to the workplace-based return to work process. For instance, the relatively unrecognised contribution of coworkers to the success of the return to work process is an important finding of our study (Tjulin et al. 2010). These results challenge earlier research on workplace-based return to work interventions focusing on the re-entering worker's physical function (Carroll et al. 2010; Van Oostrom et al. 2009) and the relations between the re-entering worker and the supervisor or employer during the back-to-work phase when the worker re-enters the workplace (Franche et al. 2005a, b; Holmgren and Dahlin Ivanoff 2007; MacEachen et al. 2006; Wynne-Jones et al. 2010).

5.4.1 The Role of the Supervisor

Our study reinforces previous findings that identify the supervisor as an important actor at the workplace. A review of qualitative research on return to work showed that a supervisors' daily social interaction and awareness of a worker's physical conditions were significant for successful return to work (MacEachen et al. 2006). The supervisor could lend legitimacy to a re-entering worker's condition and work ability restrictions and contribute to smoothing social relations at the workplace (Lysaght and Larmour-Trode 2008; Nordqvist et al. 2003; Shaw et al. 2003). However, several studies have shown supervisory obstacles for facilitating the return to work process (MacEachen et al. 2006), such as lacking skills, training or time for managing return to work (Baril et al. 2003; Nordqvist et al. 2003), and conflicting priorities when responsibility for return to work was viewed as an unwanted burden within the supervisory assignment (Tjulin et al. 2009).

Our study found that the supervisors were important actors at the workplace. However, their uncertainty about their expected roles as return to work facilitators created consequences for the return to work process. Whether the supervisor was present (active) or absent (inactive) in the return to work process had potential consequences for communication and social tensions in the workgroup. The presence of an active supervisor who could distribute and prioritise among return to work activities and work tasks promoted a conflict-avoiding strategy (Tjulin et al. 2011b).

5.4.2 The Contribution of Coworkers

The limited amount of research about the role of coworkers in the return to work process often describes them in negative terms as selfish and more concerned about having to take on a heavier workload than actually supporting the re-entering worker's work ability (Baril et al. 2003; Larsson and Gard 2003; Roberts-Yates 2003). Research on return to work coordinator competencies thought important for managing the return to work process ranked the ability to monitor coworker responses to returning workers as one of the lowest competencies needed (Pransky et al. 2004). Our study of return to work social relations of all workplace parties within a series of workplaces has brought to light the critical yet informal role of the coworker in return to work.

5.4.3 Early Contact

Early contact with the re-entering worker during the phase when he/she is off-work is emphasised in earlier research (Franche et al. 2005a, b), national policies (Försäkringskassan 2009; NHS 2009; WorkCover 2003; WSIB 2009) and organisational policies for return to work studied as presented in this Swedish study.

Research, national policies and organisational policies emphasise early return to work as a facilitator for decreasing time away from work for the re-entering worker. However, early return to work has created a static view of the re-entering worker (MacEachen et al. 2007) and, as seen in our study, can prompt uncertainty and anxiety for the workgroup about how to interact with the re-entering worker (Tjulin et al. 2010, 2011a, b). In the early phase of sick leave, the re-entering worker may be more concerned about having access to medical treatment than having contact with the workplace (Young et al. 2005a, b). Our findings show that social contact between coworkers and the re-entering worker is not merely a binary question of "contact" or "no contact". Rather, it is one of nuances: how to make the re-entering worker feel valued while balancing boundaries of work and personal space (Tjulin et al. 2011a).

This issue of balancing is also discussed as part of the supervisory role (Wynne-Jones et al. 2010). A qualitative study about social support shows that re-entering workers appreciated emotional support from coworkers, such as demonstrating caring, interest, encouragement and trust (Lysaght and Larmour-Trode 2008). In our study, the supervisors, as well as re-entering workers and coworkers, experienced concerns about balancing and acknowledging individual needs in the return to work process (Tjulin et al. 2011a). There was a thin line between feeling welcomed back at the workplace and still being accorded privacy for recovery. In one qualitative study, employees tended to view contact as intrusive of their private health management, whereas managers saw contact as essential for planning and maintaining productivity. However, the managers also acknowledged the difficulties of balancing good communication and providing support while avoiding the pressure of getting employees back-to-work prematurely (Wynne-Jones et al. 2010). Earlier studies show that management of the return to work process can be an unwelcome burden for supervisors and can have a negative effect on creating a shared sense of goodwill and trust (MacEachen et al. 2006).

In our study, the supervisors experienced early contact as part of their responsibility for the return to work process (Tjulin et al. 2010, 2011a) and made early contact in accordance with the organisational policy. However, one supervisor questioned whether it was advisable for a workplace to have a pre-set strategy for who should initiate the contact. Instead, coworkers were mentioned as facilitating contact since they worked most closely with the re-entering worker, in contrast to supervisors who did not always have daily proximity to their workers (MacEachen et al. 2006). These findings are in line with in qualitative studies where findings show that not all supervisors or managers appreciated the formality and the rigidity of policies, since interpretation of policies did not allow for a sensitive and supportive approach towards the employee. This issue in turn could lead to a general workplace culture of not believing that employees were ill, with underlying problems such as employees attending work despite being sick and experiencing stress and anxiety over their health. In addition, findings showed that supervisors or managers had major concerns about how to handle absence (Baker-McClearn et al. 2010; Eakin et al. 2003).

5.4.4 Accommodation and Communication

Workplace accommodations and communication among the workplace and other key stakeholders are important in the back-to-work phase, according to earlier research (Franche et al. 2005a, b; Krause et al. 1998; Loisel et al. 2005a, b). In a recent Swedish study, it became apparent that healthcare services and the Social Insurance Agency assessed work ability and eligibility for sickness benefits without giving any consideration to specific work tasks and without consulting the specific workplace (Ståhl 2010). In a Canadian study, it was argued that if physicians did not make workplace visits, then they could not get a full understanding of the returning worker's work ability (Friesen et al. 2001).

Also, self-efficacy is one factor among others that has been explored in relation to return to work. Findings show that self-efficacy, i.e. the belief in one's capabilities to organise and execute the courses of action required to produce given outcomes, is not only related to the re-entering worker's ability to perform a discrete physical task; it is also related to the ability to fulfil the occupational role, which in turn was more dependent on the ability to access help, manage symptoms and meet productivity demands (Shaw and Huang 2005).

In a Swedish study, occupational health consultants stressed the importance of tools that extended beyond work ability assessments to include workplace assessments to facilitate the entire return to work process. They expressed a need for earlier contact with the supervisor in the process to identify accommodations for the re-entering worker and therefore more targeted interventions at the workplace. The assumption was that closer contact with the supervisor would facilitate the occupational health consultant's understanding of the supervisor's expectations of the worker and their evaluation of what kind of workplace modifications might be possible (Tjulin et al. 2009). Therefore, workplace assessments might shift focus from seeing the re-entering worker as the subject of accommodations, to viewing the workplace as the arena for accommodations.

As shown in earlier research, communication at the workplace and between the healthcare provider and the workplace is needed to ensure that the realistic potential for sustainability at work after a re-entry is discussed (Shaw and Huang 2005; Young et al. 2005a, b; MacEachen et al. 2012). A recent study has shown that a good relationship between the re-entering worker and the supervisor has the potential to facilitate return to work sustainability (Young 2010a). This relationship in turn might prevent workplaces from offering inadequate accommodations to the returning worker (Eakin et al. 2003). However, the results from our study of social relations show that communication with occupational health consultants did not always facilitate the process, due to a discrepancy in goals for how the return to work process should be managed. Although supervisors sometimes appreciated the advice given by the occupational health consultants, they were uncertain about the practical realities of the suggested accommodation (Tjulin et al. 2010). Earlier research confirms our findings that clinicians rarely communicate with the workplace and do not assess workplace concerns, while employers are unwilling or unable to implement workplace accommodations (Costa-Black et al. 2007; Loisel et al. 2005a, b; Pransky et al. 2004). These challenges in the back-to-work phase need to link interventions focusing on the individual worker with interventions on an organisational level (Shaw et al. 2009).

5.4.5 The Importance of Social Relations

A cross-country comparative study shows that workplace-based interventions are absent in Swedish workplaces, with the exception of workplace training (Anema et al. 2009). Our study findings show that coworkers do a great deal "behind the scenes" to facilitate return to work in the back-to-work phase, and these efforts often go unnoticed by supervisors (Tjulin et al. 2010, 2011a, b). Throughout the return to work process, coworkers assume social responsibility during with the re-entering worker, puzzling out schedules and work tasks to make day-to-day activities work for all involved (Tjulin et al. 2010). Other studies have shown that workplace norms of equally sharing the workload, i.e. requiring full ability to function professionally, can lead both supervisor and coworkers to discourage workers from returning before they are fully able to resume their work tasks (Eakin et al. 2003).

Re-entering workers can have feelings of guilt about the impact of their absence on coworkers, especially if they have re-entered the workplace but are unable to fully perform their work tasks (Wynne-Jones et al. 2010). Previous research studies have shown that re-entering workers can experience a change in body and mind function that affects their management of work tasks and relations with their coworkers (Parsons et al. 2008) as well as the sustainability of their work capacity (Shaw and Huang 2005; Young et al. 2005a, b). Re-entering workers cannot be viewed as individuals who simply re-enter after a time away from work, expected to "pick up where they left off" (Parsons et al. 2008). Our findings show that during the return to work process, coworkers struggled to balance their expectations of the re-entering worker to function socially and professionally.

However, the novel finding in our study is that coworker expectations of re-entering workers managing their work tasks and social interactions at the workplace affected their acceptance and the facilitation of returning workers' extra needs for personal space and time during work re-entry (Tjulin et al. 2011b). Indeed, if return to work motivation is conceptualised as a workgroup-level rather than individual-level issue (De Rijk et al. 2009), the relevance of the re-entering worker's social context becomes increasingly apparent, including the role of the work group in supporting the re-entering worker to perform socially and professionally as expected. Thus, the findings in our study show that workplace social relations go hand in hand with work tasks and the social context of the workplace (how tasks are allocated and how returning workers are supported by others), which could "make or break" the return to work situation (Tjulin et al. 2010).

Although research identifies the significance of support from coworkers to enable return to work (Young 2010b), no studies have been conducted to date where workplace-based interventions are performed with the notion that support is needed after the initial re-entry to the workplace if recurrence of sick leave is to be prevented (Arends et al. 2010). To date, workplace-based interventions for facilitating the return to work process have focused on changing the re-entering worker, not the work environment (Briand et al. 2008; Carroll et al. 2010; Van Oostrom et al. 2009). Based on the findings in our study (Tjulin et al. 2010), it is clear that the return to work process is more than the performance of physical tasks. Re-entry to the workplace also concerns who is performing the work task, social relations involved with coworkers performing the work task and the notion that work arrangements are critical for all workers. Thus, the process of return to work is not only a problem-solving process between the supervisor and the re-entering worker. The findings identify the importance of acknowledging that coworker roles and expectations change during the progression of the return to work process. Thus, the way in which a return to work process influences social relations in the workgroup varies, depending on the individuals involved, the quality of the social relations, the type of work and work organisation and management strategies (Fambrough and Comerford 2006).

5.5 Implications for Return to Work Practice

To summarise, the key findings discussed show the importance and relevance of the varied roles different workplace actors play during the process of return to work, especially during the two relatively "unseen" phases of the process: the off-work phase and the sustainability phase. For instance, early contact in the off-work phase should be viewed as a concept and intervention with a social relational context that comprises more than just an activity that is carried out or not by the employer. Attention is needed to the social relational balance and the uncertainty workplace actors experience as they attempt to make appropriate contact. The findings reinforce the notion that the workplace is a socially complex dynamic setting. Social relations and interaction evolve during the return to work process. The purpose and meaning of return to work in the workgroup vary, depending on the interest and motivation of the individual worker and according to the needs of day-to-day activities and production work.

The findings presented in this chapter have implications for employers and organisational return to work policies. Policies for the return to work process need to take into account the social relations among workplace actors, especially involving coworkers. Otherwise, proper attention to work arrangements, social communication and the role of coworkers in the return to work process might not be present. Policies for the return to work process need to include interventions that relate to specific phases of the process. Increased acknowledgement is needed in the post-re-entry phase to prevent a "letting go" perspective of sustainable work ability, so that responsibility to "make it work" is not left solely to the coworkers. Attention to the invisibility of return to work efforts of some workplace actors and to uncertainty about how and when return to work should be enacted among the workplace actors can promote successful and sustainable work ability for the re-entering worker.

The findings in our study can be seen as a starting point for future research. The key findings presented are restricted to a Swedish context, and it is possible that workplace social relations in return to work are a cultural phenomenon. In studies of workplaces in other jurisdictions, the findings might not be the same, for instance, the positive contribution and prominent role of coworkers in return to work might differ in culturally collectivistic versus individualistic work environments. In future qualitative as well as quantitative studies, these cross-cultural aspects can be tested and further elaborated. However, when it comes to application across jurisdictions, our findings play an important part in highlighting the need to consider social relations in workplace-based return to work.

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6 Integration and Application of the International Classification of Functioning, Disability and Health (ICF) in Return to Work

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Abbreviations

DOT	Dictionary of occupational titles
FCE	Functional capacity evaluation
ICF	International classification of functioning disability and health
MGS	Minimal generic set
RTW	Return to work
VR	Vocational rehabilitation
WHO	World Health Organization
WHO DAS 2.0	World Health Organization-Disability Assessment Schedule version 2.0
WHS	World Health Survey
WORQ	Work Rehabilitation Questionnaire

> "… for a man partially incapacitated would probably be unable to find or might experience much difficulty in finding employment in the open market before his restoration to full working capacity."—John Collie, M.D. (1916)

6.1 Introduction

In 1916, physician Sir John Collie discussed the impediments for injured workers to return to work. His article was published in the British Medical Journal and provided what could be one of the earliest publications on the challenges and difficulties encountered by the worker (and the employer), case in point being the worker not only *recovering* from the ill effects of injury or a health condition which prevents engaging with work, but also *sustaining* that recovery (Collie 1916). Now, about a century later, return to work as a process has greatly evolved and become a multifactorial process with much more complex outcomes.

This chapter introduces the challenges in tackling the return to work (RTW) process and outcomes and its implication for vocational rehabilitation (VR). To address these challenges, the International Classification of Functioning, Disability and Health (ICF) (WHO 2001) model of the World Health Organization (WHO) will be discussed, focusing on how the ICF model can help us understand and examine the broader context of work disability. Moreover, the use of

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the ICF will be illustrated by state-of-the-art examples to concretize the ICF's application, integration, and utility in RTW.

6.2 ICF[1]

6.2.1 The ICF as a Conceptual Model

The World Health Assembly endorsed the ICF (WHO 2001) in May 2001 as a common framework and language to describe the full spectrum of human functioning and disability. The ICF is a conceptual model and also a classification system with applications to clinical care and research, health and social policy, and public health. The ICF can be used to understand health and health-related domains, as a common language of disability, and as a basis to compare data across regions and countries (WHO 2001). The ICF can be used regardless of the setting, culture, and context.

As a conceptual model, the ICF illustrates the interrelationship among a health condition (disease or injury) and its impact on the individual's body (as depicted by the body functions and body structure components), and its impact on the individual's participation in the society (as depicted by activities and participation component). These different components represent the "functioning" aspect of the ICF and functioning may be influenced by contextual factors, which include environmental and personal factors (see Fig. 6.1).

6.2.2 The ICF as a Classification System

In the ICF, there are different components of human functioning (and disability): *Body functions* and *body structures* classify functions and structures at the organ system level, respectively, *Activities and participation* classify the full range of actions, tasks, and social or life roles. These three components can be influenced in the context of the person (i.e., *personal factors*) and his/her physical, social, and attitudinal environment (i.e., *environmental factors*). Each ICF component except for *personal factors* is coded by the letters "b" for *body functions,* "s" for *body structures,* "d" for *activities and participation,* and "e" for *environmental factors. Personal factors* is defined as the "… background of an individual's life and living, and comprise features of the individual that are not part of a health condition or health states" (WHO 2001 p. 17) and is not coded at this time.

Each ICF component is broken down into chapters, or domains (for example, in *body functions* the chapters include Mental Functioning, Sensory Functions and Functions of the cardiovascular, hematological, immunological and respiratory system) and each chapter comprises several alphanumerically coded *ICFcategories* that are specific units of a functioning domain. Each ICF category is assigned a distinct alphanumeric code that identifies the component (b, s, d, or e), chapter (number), and level (specific domains) in a hierarchical structure. The classification and coding structure are presented in Fig. 6.2.

Each ICF category is assigned a component letter and numerical code, which makes each category unique. The hierarchical arrangement is illustrated below under *body functions* with the domain "pain" as an example:

ICF component	b	Body function
Chapter/first level	b2	Sensory functions and pain
Second level	b280	Sensation of pain
Third level	b2801	Pain in body part
Fourth level	b28010	Pain in head and neck

In some cases, fourth-level categories are not available for some domains. Here is another example for *activities and participation*:

ICF component	d	Activities and participation
Chapter/first level	d8	Major life areas
Second level	d850*	Remunerative employment
Third level	d8500	Self-employment
Fourth level		*No code*

*In the case of d850, other third-level ICF categories include d8501 part-time employment and d8502 full-time employment

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[1] Portions of this section of the chapter have been excerpted and used with some modification from Escorpizo R, Stucki G, Cieza A, Davis K, Stumbo T, Riddle DL (2010). Creating an interface between the International Classification of Functioning, Disability and Health and physical therapist practice. *Physical Therapy*, *90*(7), 1053–1063 (including Supplement Material), with kind permission of the American Physical Therapy Association (APTA).

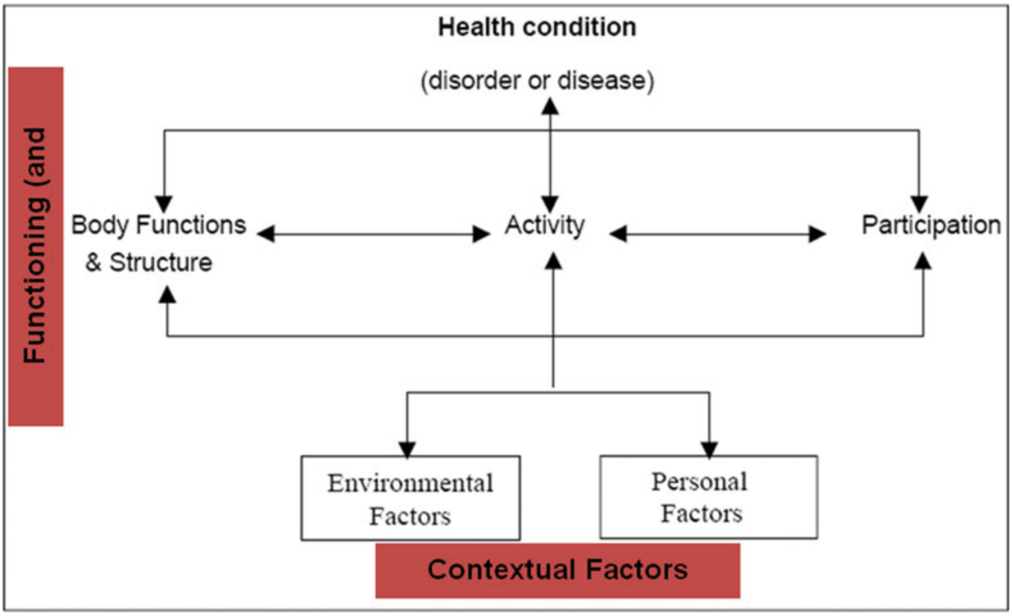

Fig. 6.1 The International Classification of Functioning, Disability and Health (ICF) model of the WHO (2001). Adapted from Escorpizo et al. (Jul/2010). Creating an interface between the International Classification of Functioning, Disability and Health and physical therapist practice, *Physical Therapy*, *90*(7), 1053–1063, with permission of the American Physical Therapy Association. This material is copyrighted, and any further reproduction or distribution requires written permission of the APTA

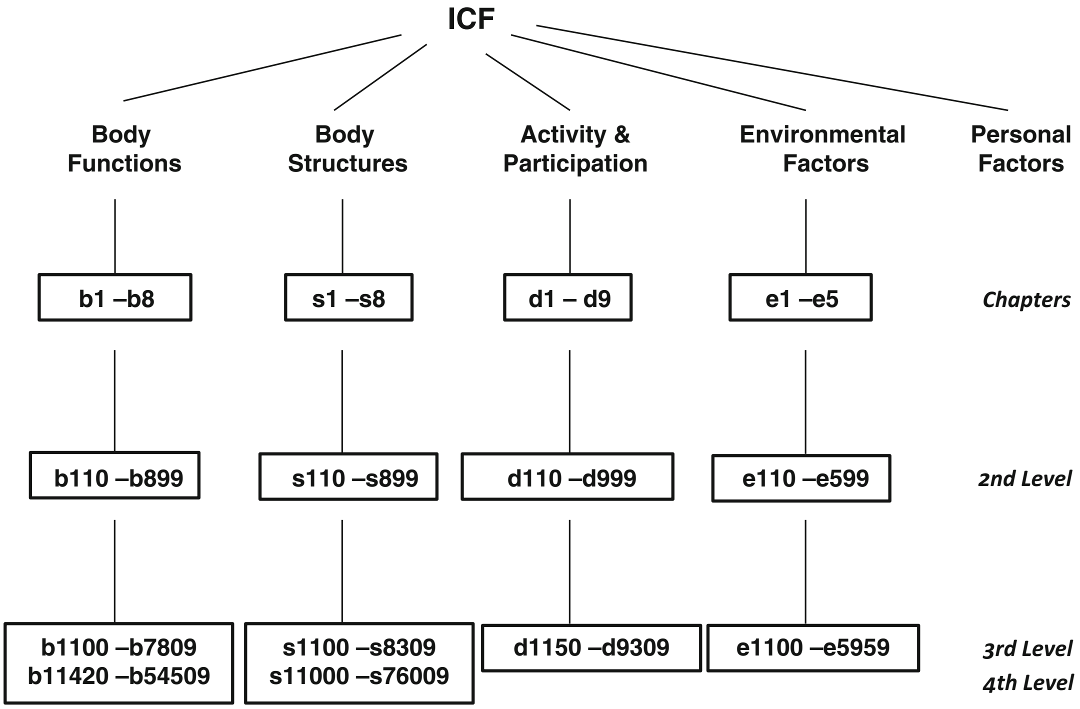

Fig. 6.2 The hierarchical structure of the ICF: From chapter level down to fourth-level ICF category specification (WHO 2001). (Note: "b1–b8" means that there are eight chapters to *body functions*, "s1–s8" means that there are also eight chapters to *body structures*, and so forth.) Adapted from Escorpizo et al. (Jul/2010). Creating an interface between the International classification of functioning, disability and health and physical therapist practice. *Physical Therapy, 90*(7), 1053–1063, with permission of the American Physical Therapy Association. This material is copyrighted, and any further reproduction or distribution requires written permission of the APTA

As illustrated above, third- and fourth-level categories are specifications of the more general and higher levels, namely the second and first levels. In the entire ICF, there are 30 chapters in total and 1424 separate categories distributed across the four codeable ICF components.

6.2.3 ICF Contents in Detail

Table 6.1 illustrates the depth and breadth of coverage of the ICF at the chapter level. There are eight chapters for *body functions* ranging from mental to integumentary functions and also eight chapters for *body structures* (covering all body organ systems). *Activities and participation* has nine chapters ranging from the simple, person level (learning and applying knowledge) to the more complex, societal level (community, social, and civic life). Finally, *environmental factors* cover the entire physical, human-built, technological, attitudinal, and social and political world, which are divided into five chapters (see Table 6.1).

Table 6.2 illustrates the specification of Chapter 4 Mobility, in particular the *activities and participation* component. From this table, mobility is categorized into several mobility-relevant descriptions, such as body position, handling objects, walking, and using transportation. Each category is defined in the ICF handbook and inclusion and exclusion criteria for each are also provided to make the distinction among ICF categories. The ICF handbook has more detailed descriptions of ICF categories (WHO 2001).

6.2.4 The ICF Qualifier

The ICF qualifiers can be used to rate the severity or magnitude of an impairment in categories; i.e., *body functions* or *body structures*, limitations in *activity,* restrictions in *participation, and* whether an *environmental factor* is a barrier or a facilitator. Without these qualifiers, an ICF code is less meaningful.

Table 6.1 Components and chapters of the ICF

Body functions (Chapters b1–b8)	
Chapter 1 Mental functions	Chapter 5 Functions of the digestive, metabolic, and endocrine systems
Chapter 2 Sensory functions and pain	Chapter 6 Genitourinary and reproductive systems
Chapter 3 Voice and speech functions	Chapter 7 Neuromusculoskeletal and movement-related functions
Chapter 4 Functions of the cardiovascular, hematological, immunological, and respiratory systems	Chapter 8 Functions of the skin and related structures
Body structures (Chapters s1–s8)	
Chapter 1 Structures of the nervous system	Chapter 5 Structures related to the digestive, metabolic, and endocrine systems
Chapter 2 The eye, ear, and related structures	Chapter 6 Structures related to genitourinary and reproductive systems
Chapter 3 Structures involved in voice and speech	Chapter 7 Structures related to movement
Chapter 4 Structures of the cardiovascular, immunological, and respiratory systems	Chapter 8 Skin and related structures
Activities and participation (Chapters d1–d9)	
Chapter 1 Learning and applying knowledge	Chapter 6 Domestic life
Chapter 2 General tasks and demands	Chapter 7 Interpersonal interactions and relationships
Chapter 3 Communication	Chapter 8 Major life areas
Chapter 4 Mobility	Chapter 9 Community, social, and civic life
Chapter 5 Self-care	
Environmental factors (Chapters e1–e5)	
Chapter 1 Products and technology	Chapter 4 Attitudes
Chapter 2 Natural environment and human-made changes to environment	Chapter 5 Services, systems, and policies
Chapter 3 Support and relationships	

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Table 6.2 Chapter on "mobility" and its second-level categories

Mobility	Second-level categories
Changing and maintaining body position	d410 Changing basic body position d415 Maintaining a body position d420 Transferring oneself d429 Changing and maintaining body position, other specified and unspecified
Carrying, moving, and handling objects	d430 Lifting and carrying objects d435 Moving objects with lower extremities d440 Fine hand use d445 Hand and arm use d449 Carrying, moving, and handling objects, other specified and unspecified
Walking and moving	d450 Walking d455 Moving around d460 Moving around in different locations d465 Moving around using equipment d469 Walking and moving, other specified and unspecified
Moving around using transportation	d470 Using transportation d475 Driving d480 Riding animals for transportation d489 Moving around using transportation, other specified and unspecified d498 Mobility, other specified d499 Mobility, unspecified

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There are different levels of the ICF qualifier. Here, we simply focus on the first-level qualifier; for other levels, see the ICF handbook for details. The first-level qualifier is a generic rating scale from 0 to 4, with 0 = no problem, 1 = mild problem, 2 = moderate problem, 3 = severe problem, and 4 = complete problem. Two additional options can be used: 8 (not specified)[2] and 9 (not applicable)[3]. On the other hand, the ICF qualifier for the *environmental factors* has nine response options ranging from 4 (complete barrier) to +4 (complete facilitator), with a zero value indicating neither a facilitator nor a barrier. Three additional options for environmental factors can be used: 8 (barrier, not specified), +8 (facilitator, not specified), and 9 (not applicable) using the same principles, which were stated earlier (WHO 2001). For each ICF qualifier, the WHO also provides a corresponding range of percentage. See Table 6.3 for a summary of the ICF qualifiers.

So for example, an ICF code with qualifier of "b134.1" means a mild (or 5–24 %) impairment of sleep functions exists. The "b134" refers to the ICF code on sleep functions and the ".1" refers to the ICF qualifier for mild impairment. ICF categories belonging to *activities and participation* require performance[4] and capacity[5] qualifiers, which means at least two first qualifiers. An example is "d4300.32" which means a severe (50–95%) difficulty with performance in lifting (d4300) and moderate (25–49%) difficulty with capacity in lifting is rated. The first of the two qualifiers refers to performance and the second to capacity. For *environmental factors*, a plus sign denotes that environmental factor is a facilitator and no sign denotes a barrier. So for example, a code of "e330.+4" means that support and relationship with "people in positions of authority" (i.e., e330) is a complete (96–100%) facilitator. Readers are advised to consult the ICF handbook for more details on the ICF qualifiers.

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[2] When there is not enough or insufficient information to rate an ICF category.

[3] When rating an ICF category is not applicable, e.g., assessing d830 higher education in an individual who is still in high school.

[4] Performance qualifier refers to what an individual does in his/her *current environment or actual context* in which they he/she lives; involves the influence of environmental factors.

[5] Capacity qualifier refers to an individual's ability tested in a standard or uniform environment (i.e., adjusted for environment).

Table 6.3 ICF qualifiers with corresponding percentage values provided by the WHO

ICF qualifier	Equivalent percentage (%)
Body functions, body structures, and activities and participation	
0 NO problem (none, absent, negligible, …)	0–4
1 MILD problem (slight, low, …)	5–24
2 MODERATE problem (medium, fair, …)	25–49
3 SEVERE problem (high, extreme, …)	50–95
4 COMPLETE problem (total, …)	96–100
Environmental factors	
+4 Complete facilitator	96–100
+3 Substantial facilitator	50–95
+2 Moderate facilitator	25–49
+1 Mild facilitator	5–24
0 Neither barrier nor facilitator	0–4
1 Mild barrier	5–24
2 Moderate barrier	25–49
3 Severe barrier	50–95
4 Complete barrier	96–100

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ICF qualifiers are designed to rate how much problem there is with a particular item; that is, the higher the number or percentage, the worse is the problem. In the case of environmental factors, ICF qualifiers are used to rate how of a barrier or facilitator (annotated with a plus sign) an environmental item is; that is, the higher the number the more of a facilitator (with plus) or barrier that environmental factor

6.3 Work Disability and Vocational Rehabilitation

6.3.1 Work Disability

Work participation or employment is a major area of people's lives. However, when a worker becomes affected with a health condition, illness, or disease, work disability may result and prevent the individual from working. Work disability may be associated with personal suffering, limitations in functioning, loss of income, high medical costs, and strained relationships of the individual with others. In addition, work disability may lead to diminished productivity and increased societal costs.

Work disability poses a great burden and challenge to both developing (Chan and Zhuo 2011) and developed nations (OECD 2009; Stubbs and Deaner 2005); indirect costs make up the bulk of the burden in industrialized countries, approximately 80 % (Dagenais et al. 2008). The challenge is to mitigate work disability-related burden and sustain optimal work participation.

6.3.2 Vocational Rehabilitation

Vocational rehabilitation (VR) is defined as "a multi-professional evidence-based approach that is provided in different settings, services, and activities to working age individuals with health-related impairments, limitations, or restrictions with work functioning, and whose primary aim is to optimize work participation" (Escorpizo et al. 2011a, b). This general definition is based on the ICF model and emphasizes the breadth and complexity of factors that are relevant to VR. This conceptual definition considers the aspects of VR based on the components of the ICF: *body functions* and *body structure*, *activities and participation*, and contextual factors.

The primary goal of VR is both return to work (RTW) and sustained RTW. In some cases, the individual did not work before (i.e., does not have any work history) and hence in this situation the individual engages in work versus return to work. However, this transition still occurs within the context of vocational rehabilitation. For example, a person who just graduated from high school and had an accident, which resulted in spinal cord injury, wants to work. In this case, vocational rehabilitation is designed to ensure that the person is able to participate in some sort of employment despite the disability.

6.3.3 Why Integrate ICF and Work

The biopsychosocial perspective of the ICF has been recently used in the definition of VR (see definition above) (Escorpizo et al. 2011a, b). This first step aligns a conceptual definition based on the ICF with research and practice in the field of VR. Laying out this conceptualization of VR contributes to the pursuit and better understanding of the operationalization and application of the ICF in VR and RTW strategies.

The experience of work and employment is a universal, common experience regardless of the country, nationality, and culture. Work disability, hence, also becomes universal when it prevents a person from working. The ICF was intended by the WHO to be a universal language when describing functioning and can be applied in the work context. The breadth of the ICF model is evident in its comprehensive set of functioning domains, which addresses the multifactorial nature and complexity of vocational rehabilitation and RTW. The ICF model can be used to select relevant domains for VR and measures of successful RTW.

6.4 ICF Application to Vocational Rehabilitation and Return to Work

6.4.1 The ICF Core Sets

The ICF Core Set consists of a carefully selected short list of ICF categories that makes the hundreds of categories contained in the ICF practical and useable. A Core Set is designed to be applicable to a specific health condition, health-related event, or a specific setting; it can describe the most salient aspects of the disability experience with the health condition or setting. Multiple Core Sets are available for different health conditions or settings. Each ICF Core Set is a product of extensive expert input and validation studies; it is data driven, multi-perspective, and consensus based (Cieza et al. 2004).

The general methodology for Core Set development involves a structured set of processes that include preparatory studies: systematic review of the literature, an expert survey, cross-sectional study, and qualitative patient interviews. Each study seeks to identify the most relevant ICF categories to a specific health condition or setting. The final selection of ICF categories for inclusion in the Core Set culminates in a multistage consensus process.

6.4.2 The Comprehensive and Brief ICF Core Sets

A Core Set exists in two versions: comprehensive or brief (Cieza et al. 2004). A comprehensive Core Set (with more ICF categories) is usually utilized in multidisciplinary assessment and has as few categories as possible to still be practical but as many as necessary to capture the full spectrum of variables specific to a health condition or health-related event. A brief Core Set (with less ICF categories than the comprehensive version), on the other hand, contains the minimum number of categories to be included in studies or trials on a health condition and can be used by a single discipline in a clinical encounter, for example. In multidisciplinary settings, such as hospitals, a variety of health professionals can use the comprehensive Core Set as functioning domains, while in a private outpatient clinic, a healthcare practitioner may find it more convenient to use the brief version, which already provides the minimum number of ICF categories to be assessed. As a general rule, clinicians and researchers can always use additional ICF categories not already included in the Core Set, if they feel that those categories are essential for their purpose and setting.

6.4.3 The ICF Core Set for Vocational Rehabilitation

In light of the ICF Core Set development, the ICF Core Set for Vocational Rehabilitation aimed to develop a list of relevant ICF categories to describe the functioning of individuals in vocational rehabilitation (Escorpizo et al. 2010, 2012). Table 6.4 contains the comprehensive ICF Core Set for Vocational Rehabilitation with the brief ICF Core Set written in bold.

Table 6.4 Comprehensive ICF core set for vocational rehabilitation, $N=90$

ICF code	Title	Short description
Activities and participation		
d155	**Acquiring skills**	Developing basic and complex competencies in integrated sets of actions or tasks so as to initiate and follow through with the acquisition of a skill, such as manipulating tools or playing games like chess
d160	Focusing attention	Intentionally focusing on specific stimuli, such as by filtering out distracting noises
d163	Thinking	Formulating and manipulating ideas, concepts, and images, whether goal oriented or not, either alone or with others, such as creating fiction, proving a theorem, playing with ideas, brainstorming, meditating, pondering, speculating, or reflecting
d166	Reading	Performing activities involved in the comprehension and interpretation of written language (e.g., books, instructions, or newspapers in text or Braille), for the purpose of obtaining general knowledge or specific information
d170	Writing	Using or producing symbols or language to convey information, such as producing a written record of events or ideas or drafting a letter
d172	Calculating	Performing computations by applying mathematical principles to solve problems that are described in words and producing or displaying the results, such as computing the sum of three numbers or finding the result of dividing one number by another
d175	Solving problems	Finding solutions to questions or situations by identifying and analyzing issues, developing options and solutions, evaluating potential effects of solutions, and executing a chosen solution, such as in resolving a dispute between two people
d177	Making decisions	Making a choice among options, implementing the choice, and evaluating the effects of the choice, such as selecting and purchasing a specific item, or deciding to undertake and undertaking one task from among several tasks that need to be done
d210	Undertaking a single task	Carrying out simple or complex and coordinated actions related to the mental and physical components of a single task, such as initiating a task; organizing time, space, and materials for a task; pacing task performance; and carrying out, completing, and sustaining a task
d220	Undertaking multiple tasks	Carrying out simple or complex and coordinated actions as components of multiple, integrated, and complex tasks in sequence or simultaneously
d230	Carrying out daily routine	Carrying out simple or complex and coordinated actions in order to plan, manage, and complete the requirements of day-to-day procedures or duties, such as budgeting time and making plans for separate activities throughout the day
d240	**Handling stress and other psychological demands**	Carrying out simple or complex and coordinated actions to manage and control the psychological demands required to carry out tasks demanding significant responsibilities and involving stress, distraction, or crises, such as driving a vehicle during heavy traffic or taking care of many children
d310	Communicating with—receiving—spoken messages	Comprehending literal and implied meanings of messages in spoken language, such as understanding that a statement asserts that a factor is an idiomatic expression
d315	Communicating with—receiving—nonverbal messages	Comprehending the literal and implied meanings of messages conveyed by gestures, symbols, and drawings, such as realizing that a child is tired when he/she rubs his/her eyes or that a warning bell means that there is a fire
d350	Conversation	Starting, sustaining, and ending an interchange of thoughts and ideas, carried out by means of spoken, written, sign, or other forms of language, with one or more people one knows or who are strangers, in formal or casual settings
d360	Using communication devices and techniques	Using devices, techniques, and other means for the purposes of communicating, such as calling a friend on the telephone

(continued)

Table 6.4 (continued)

ICF code	Title	Short description
d410	Changing basic body position	Getting into and out of a body position and moving from one location to another, such as getting up out of a chair to lie down on a bed, and getting into and out of positions of kneeling or squatting
d415	Maintaining a body position	Staying in the same body position as required, such as remaining seated or remaining standing for work or school
d430	Lifting and carrying objects	Raising up an object or taking something from one place to another, such as when lifting a cup or carrying a child from one room to another
d440	Fine hand use	Performing the coordinated actions of handling objects, picking up, manipulating, and releasing them using one's hand, fingers, and thumb, such as required to lift coins off a table or turn a dial or knob
d445	Hand and arm use	Performing the coordinated actions required to move objects or to manipulate them by using hands and arms, such as when turning door handles or throwing or catching an object
d450	Walking	Moving along a surface on foot, step by step, so that one foot is always on the ground, such as when strolling, sauntering, and walking forwards, backwards, or sideways
d455	Moving around	Moving the whole body from one place to another by means other than walking, such as climbing over a rock or running down a street, skipping, scampering, jumping, somersaulting, or running around obstacles
d465	Moving around using equipment	Walking and moving around in various places and situations, such as walking between rooms in a house, within a building, or down the street of a town
d470	Using transportation	Using transportation to move around as a passenger, such as being driven in a car or on a bus, rickshaw, jitney, animal-powered vehicle, or private or public taxi, bus, train, tram, subway, boat, or aircraft
d475	Driving	Being in control of and moving a vehicle or the animal that draws it, travelling under one's own direction or having at one's disposal any form of transportation, such as a car, bicycle, boat, or animal-powered vehicle
d530	Toileting	Planning and carrying out the elimination of human waste (menstruation, urination, and defecation), and cleaning oneself afterwards
d540	Dressing	Carrying out the coordinated actions and tasks of putting on and taking off clothes and footwear in sequence and in keeping with climatic and social conditions, such as by putting on, adjusting, and removing shirts, skirts, blouses, pants, undergarments, saris, kimono, tights, hats, gloves, coats, shoes, boots, sandals, and slippers
d570	Looking after one's health	Ensuring physical comfort, health, and physical and mental well-being, such as by maintaining a balanced diet, and an appropriate level of physical activity, keeping warm or cool, avoiding harms to health, following safe sex practices, obtaining immunizations, and regular physical examinations
d710	Basic interpersonal interactions	Interacting with people in a contextually and socially appropriate manner, such as by showing consideration and esteem when appropriate, or responding to the feelings of others
d720	**Complex interpersonal interactions**	Maintaining and managing interactions with other people, in a contextually and socially appropriate manner, such as by regulating emotions and impulses, controlling verbal and physical aggression, acting independently in social interactions, and acting in accordance with social rules and conventions
d740	Formal relationships	Creating and maintaining specific relationships in formal settings, such as with employers, professionals, or service providers
d820	School education	Gaining admission to school and education, engaging in all school-related responsibilities and privileges, and learning the course material, subjects, and other curriculum requirements in a primary or secondary education program, including attending school regularly; working cooperatively with other students; taking direction from teachers; organizing, studying, and completing assigned tasks and projects; and advancing to other stages of education

(continued)

Table 6.4 (continued)

ICF code	Title	Short description
d825	Vocational training	Engaging in all activities of a vocational program and learning the curriculum material in preparation for employment in a trade, job, or profession
d830	Higher education	Engaging in the activities of advanced educational programs in universities, colleges, and professional schools and learning all aspects of the curriculum required for degrees, diplomas, certificates, and other accreditations, such as completing a university bachelor's or master's course of study, medical school, or other professional school
d840	Apprenticeship (work preparation)	Engaging in programs related to preparation for employment, such as performing the tasks required of an apprenticeship, internship, articling, and in-service training
d845	**Acquiring, keeping, and terminating a job**	Seeking, finding, and choosing employment; being hired and accepting employment; maintaining and advancing through a job, trade, occupation, or profession; and leaving a job in an appropriate manner
d850	**Remunerative employment**	Engaging in all aspects of work, as an occupation, trade, profession, or other form of employment, for payment, as an employee, full or part time, or self-employed, such as seeking employment and obtaining a job, performing the required tasks of the job, attending work on time as required, supervising other workers or being supervised, and performing required tasks alone or in groups
d855	**Non-remunerative employment**	Engaging in all aspects of work in which pay is not provided, full time or part time, including organized work activities, performing the required tasks of the job, attending work on time as required, supervising other workers or being supervised, and performing required tasks alone or in groups, such as volunteer work, charity work, working for a community or religious group without remuneration, and working around the home without remuneration
d870	Economic self-sufficiency	Having command over economic resources, from private or public sources, in order to ensure economic security for present and future needs
Environmental factors		
e1101	Drugs	Any natural or human-made object or substance gathered, processed, or manufactured for medicinal purposes, such as allopathic and naturopathic medication
e115	Products and technology for personal use in daily living	Equipment, products, and technologies used by people in daily activities, including those adapted or specially designed, located in, on, or near the person using them
e120	Products and technology for personal indoor and outdoor mobility and transportation	Equipment, products, and technologies used by people in activities of moving inside and outside buildings, including those adapted or specially designed, located in, on, or near the person using them
e125	Products and technology for communication	Equipment, products, and technologies used by people in activities of sending and receiving information, including those adapted or specially designed, located in, on, or near the person using them
e130	Products and technology for education	Equipment, products, processes, methods, and technology used for acquisition of knowledge, expertise, or skill, including those adapted or specially designed
e135	Products and technology for employment	Equipment, products, and technology used for employment to facilitate work activities
e150	Design, construction, and building products and technology of buildings for public use	Products and technology that constitute an individual's indoor and outdoor human-made environment that is planned, designed, and constructed for public use, including those adapted or specially designed

(continued)

Table 6.4 (continued)

ICF code	Title	Short description
e155	Design, construction, and building products and technology of buildings for private use	Products and technology that constitute an individual's indoor and outdoor human-made environment that is planned, designed, and constructed for private use, including those adapted or specially designed
e225	Climate	Meteorological features and events, such as the weather
e240	Light	Electromagnetic radiation by which things are made visible by either sunlight or artificial lighting (e.g., candles, oil or paraffin lamps, fires, and electricity), and which may provide useful or distracting information about the world
e250	Sound	A phenomenon that is or may be heard, such as banging, ringing, thumping, singing, whistling, yelling, or buzzing, in any volume, timbre, or tone, and that may provide useful or distracting information about the world
e260	Air quality	Characteristics of the atmosphere (outside buildings) or enclosed areas of air (inside buildings), and which may provide useful or distracting information about the world
e310	**Immediate family**	Individuals related by birth, marriage, or other relationship recognized by the culture as immediate family, such as spouses, partners, parents, siblings, children, foster parents, adoptive parents, and grandparents
e320	Friends	Individuals who are close and ongoing participants in relationships characterized by trust and mutual support
e325	Acquaintances, peers, colleagues, neighbors, and community members	Individuals who are familiar to each other as acquaintances, peers, colleagues, neighbors, and community members, in situations of work, school, recreation, or other aspects of life, and who share demographic features such as age, gender, religious creed, or ethnicity or pursue common interests
e330	**People in positions of authority**	Individuals who have decision-making responsibilities for others and who have socially defined influence or power based on their social, economic, cultural, or religious roles in society, such as teachers, employers, supervisors, religious leaders, substitute decision makers, guardians, or trustees
e340	Personal care providers and personal assistants	Individuals who provide services as required to support individuals in their daily activities and maintenance of performance at work, education, or other life situation, provided either through public or private funds, or else on a voluntary basis, such as providers of support for home-making and maintenance, personal assistants, transport assistants, paid helpers, nannies, and others who function as primary caregivers
e355	Health professionals	All service providers working within the context of the health system, such as doctors, nurses, physiotherapists, occupational therapists, speech therapists, audiologists, orthotists–prosthetists, and medical social workers
e360	Other professionals	All service providers working outside the health system, including social workers, lawyers, teachers, architects, and designers
e430	Individual attitudes of people in positions of authority	General or specific opinions and beliefs of people in positions of authority about the person or about other matters (e.g., social, political, and economic issues) that influence individual behavior and actions
e450	Individual attitudes of health professionals	General or specific opinions and beliefs of health professionals about the person or about other matters (e.g., social, political, and economic issues) that influence individual behavior and actions
e460	Societal attitudes	General or specific opinions and beliefs generally held by people of a culture, society, subcultural, or other social group about other individuals or about other social, political, and economic issues that influence group or individual behavior and actions

(continued)

Table 6.4 (continued)

ICF code	Title	Short description
e465	Social norms, practices, and ideologies	Customs, practices, rules, and abstract systems of values and normative beliefs (e.g., ideologies, normative world views, and moral philosophies) that arise within social contexts and that affect or create societal and individual practices and behaviors, such as social norms of moral and religious behavior or etiquette; religious doctrine and resulting norms and practices; and norms governing rituals or social gatherings
e525	Housing services, systems, and policies	Services, systems, and policies for the provision of shelters, dwellings, or lodging for people
e535	Communication services, systems, and policies	Services, systems, and policies for the transmission and exchange of information
e540	Transportation services, systems, and policies	Services, systems, and policies for enabling people or goods to move or be moved from one location to another
e550	Legal services, systems, and policies	Services, systems, and policies concerning the legislation and other law of a country
e555	Associations and organizational services, systems, and policies	Services, systems, and policies relating to groups of people who have joined together in the pursuit of common, noncommercial interests, often with an associated membership structure
e565	Economic services, systems, and policies	Services, systems, and policies related to the overall system of production, distribution, consumption, and use of goods and services
e570	Social security services, systems, and policies	Services, systems, and policies aimed at providing income support to people who, because of age, poverty, unemployment, health condition, or disability, require public assistance that is funded either by general tax revenues or contributory schemes
e580	**Health services, systems, and policies**	Services, systems, and policies for preventing and treating health problems, providing medical rehabilitation, and promoting a healthy lifestyle
e585	Education and training services, systems, and policies	Services, systems, and policies for the acquisition, maintenance, and improvement of knowledge, expertise, and vocational or artistic skills. See UNESCO's International Standard Classification of Education (ISCED-1997)
e590	**Labor and employment services, systems, and policies**	Services, systems, and policies related to finding suitable work for persons who are unemployed or looking for different work, or to support individuals already employed who are seeking promotion
Body functions		
b117	Intellectual functions	General mental functions, required to understand and constructively integrate the various mental functions, including all cognitive functions and their development over the life-span
b126	Temperament and personality functions	General mental functions of constitutional disposition of the individual to react in a particular way to situations, including the set of mental characteristics that makes the individual distinct from others
b130	**Energy and drive functions**	General mental functions of physiological and psychological mechanisms that cause the individual to move towards satisfying specific needs and general goals in a persistent manner
b134	Sleep functions	General mental functions of periodic, reversible, and selective physical and mental disengagement from one's immediate environment accompanied by characteristic physiological changes
b140	Attention functions	Specific mental functions of focusing on an external stimulus or internal experience for the required period of time

(continued)

Table 6.4 (continued)

ICF code	Title	Short description
b144	Memory functions	Specific mental functions of registering and storing information and retrieving it as needed
b152	Emotional functions	Specific mental functions related to the feeling and affective components of the processes of the mind
b160	Thought functions	Specific mental functions related to the ideational component of the mind
b164	**Higher level cognitive functions**	Specific mental functions especially dependent on the frontal lobes of the brain, including complex goal-directed behaviors such as decision making, abstract thinking, planning and carrying out plans, mental flexibility, and deciding which behaviors are appropriate under what circumstances; often called executive functions
b210	Seeing functions	Sensory functions relating to sensing the presence of light and sensing the form, size, shape, and color of the visual stimuli
b230	Hearing functions	Sensory functions relating to sensing the presence of sounds and discriminating the location, pitch, loudness, and quality of sounds
b235	Vestibular functions	Sensory functions of the inner ear related to position, balance, and movement
b280	Sensation of pain	Sensation of unpleasant feeling indicating potential or actual damage to some body structure
b455	**Exercise tolerance functions**	Functions related to respiratory and cardiovascular capacity as required for enduring physical exertion
b730	Muscle power functions	Functions related to the force generated by the contraction of a muscle or muscle groups
b740	Muscle endurance functions	Functions related to sustaining muscle contraction for the required period of time
b810	Protective functions of the skin	Functions of the skin for protecting the body from physical, chemical, and biological threats

Sections Adapted from Escorpizo et al. (Jul/2010). Creating an interface between the International classification of functioning, disability and health and physical therapist practice. *Physical Therapy*, *90*(7), 1053–1063, with permission of the American Physical Therapy Association. This material is copyrighted, and any further reproduction or distribution requires written permission of the APTA

Brief ICF Core Set for vocational rehabilitation in bold, $N = 13$. A short description is included which is only an excerpt. For more details, consult the ICF handbook

6.5 Measurement Based on the ICF Core Set for Vocational Rehabilitation

6.5.1 ICF Contents of Existing Measures

Many patient-reported and clinician-administered questionnaires are available. To simply integrate the questionnaires with ICF contents, within the questionnaires, examine what ICF categories were included from the ICF Core Set for Vocational Rehabilitation and the ICF domains. In the past, questionnaires have been linked to the ICF using published linking rules (Cieza et al. 2005); questionnaire items link to the corresponding ICF category that best fits its content. For example, questionnaires related to presenteeism (at work productivity loss) in arthritis and musculoskeletal population have ICF links. With review, a wide range of ICF categories linked to the questionnaires but their respective contents varied greatly despite the common purpose of assessing presenteeism (Escorpizo et al. 2009). Through ICF linking, identifying gaps in existing instruments and selecting appropriate instruments are possible. Linking also allows comparison of ICF categories identified in vocational rehabilitation questionnaires with the categories in the ICF Core Set for Vocational Rehabilitation.

6.5.2 The ICF Can Be Used in Questionnaire Development

To develop an ICF Core Set-based questionnaire, we need to firstly define the purpose and context of usage of the proposed questionnaire. To illustrate, we will explain how the ICF Core Set for Vocational Rehabilitation was used to develop a new questionnaire.

After systematically reviewing the questionnaires currently used in vocational rehabilitation (Escorpizo et al. 2011a, b), no measure or questionnaire was found that captures the many functioning domains essential to VR or RTW. No generic questionnaires, typically found in the VR context, were found for usage across diverse health conditions. Also, no questionnaire was available that was specifically developed using the ICF framework of the WHO. Hence, a need to develop a new questionnaire emerged.

An ICF Core Set can, in principle, define *what* domains are to be measured, which is a first step to the development of questionnaires. However, measurement is incomplete if the issue of *how* to measure those domains is not addressed. We will demonstrate the application of the ICF Core Set for VR in a development of a patient-reported questionnaire called the Work Rehabilitation Questionnaire (WORQ). WORQ was designed to capture essential functioning domains in VR given the diverse health conditions and intervention settings provided within RTW programs. Statistical approaches like factor analysis and Rasch analysis were used to obtain the ICF categories best fitting the questionnaire and its intended purpose. The selected ICF categories based on these analyses were phrased as questionnaire-type items (rather than pure and technical ICF category definition) for clarity and better understanding by the patients. Some items were phrased using existing ICF-based generic questionnaires, such as the WHO – Disability Assessment Schedule version 2.0 (2010) and the World Health Survey (WHS) (Ustun et al. 2003), when appropriate. Technical definition of an ICF category as found in the ICF handbook was also used when appropriate for some items. Items were cognitively tested among clinicians and non-clinicians (unpublished), and were rephrased as necessary. A preliminary version of WORQ is presented in Appendix A.

6.5.3 Challenges and Opportunities

A robust and standard operationalization of ICF categories remains a challenge in the field of outcome measurement. Some ICF categories may be defined too broadly or too imprecise and others have criticized the use of the ICF qualifiers of 0–4. These challenges have resulted in doubts around the reliability (Jette 2010; Jette et al. 2008; Okochi et al. 2005) in assessing and rating ICF categories using the qualifiers. With the WORQ development, the initial step towards sound ICF-based measurement was taken.

6.5.4 Development and Opportunities: A Case Example of the Functional Capacity Evaluation

As a clinical and research tool, the ICF demonstrates usefulness in conducting evaluations in a VR setting. One example is combining the concepts of the ICF with the functional capacity evaluation (FCE), which measures the capacity to perform work-related activities (Soer et al. 2008). The field of FCE was characterized by a widespread and unguided development since its conceptualization in the 1970s. Physicians were asked to rate work (dis-)abilities of injured patients in the context of RTW decisions, but felt partially unqualified to do so. Likewise, physical and occupational therapists were asked to assess these abilities and rate them according to the Dictionary of Occupational Titles (DOT). In the decades following, VR practitioners independently developed battery of tests and terminology, and FCE started to spread around the globe. In the first decade of the twentieth century, FCE research has greatly expanded, including the need for unity in terminology and classification.

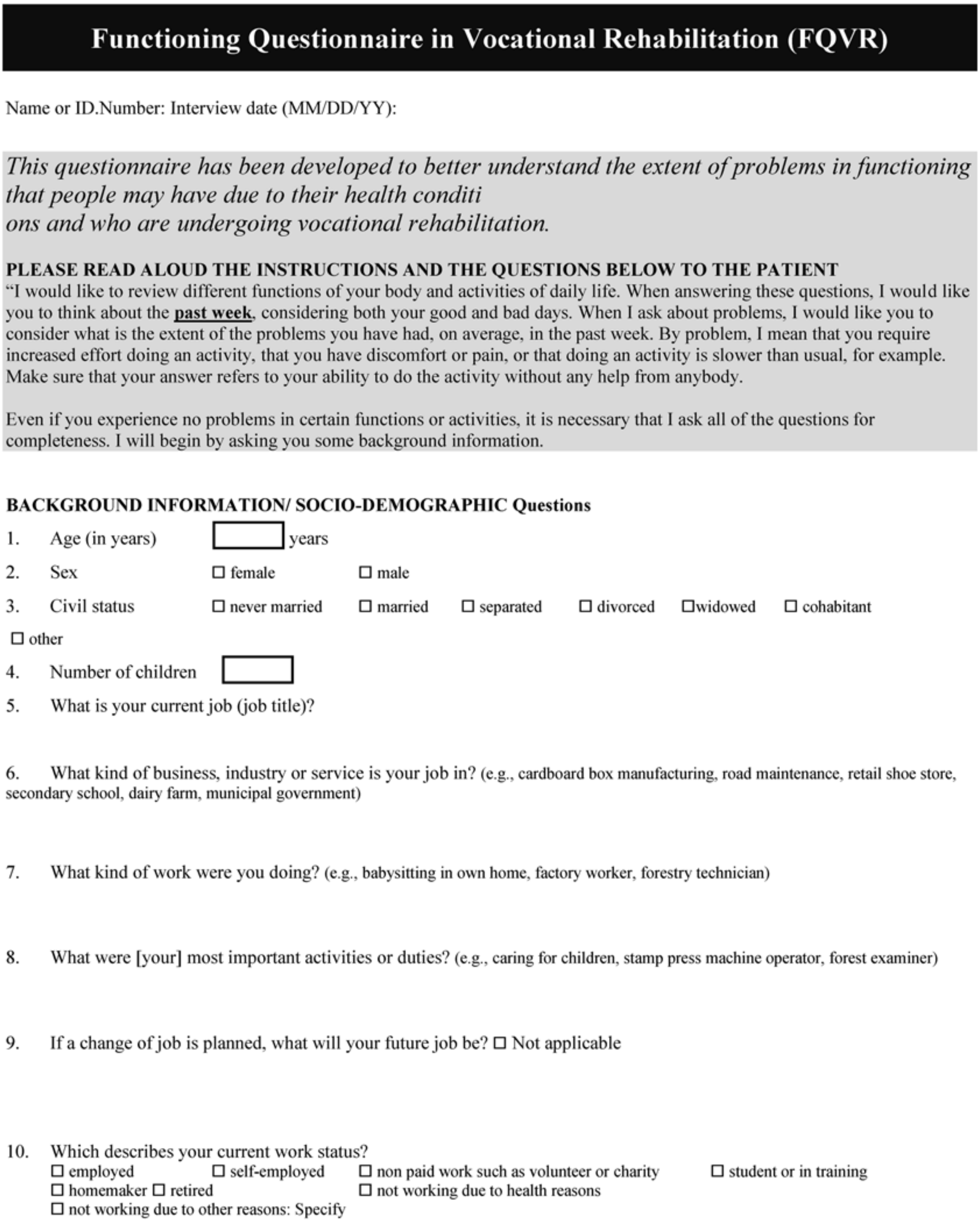
The role of the ICF model was exemplified in the following study. By means of a Delphi methodology, FCE experts (clinicians and researchers) agreed to use the ICF as a conceptual framework; here, terminology of FCE was classified and applied using predefined ICF terms. With regard to ICF terminology, FCE was defined as an evaluation of capacity of activities that is used to make recommendations for participation in work while considering the person's *body functions* and *body structures*, *environmental factors, personal factors,* and health status (Soer et al. 2008). As implied in this definition, the capacity to execute activities may be determined by a range of factors or determinants. In a systematic review, the ICF was used to classify the published evidence of determinants of capacity (van Abbema et al. 2011). Conclusions showed that much heterogeneity was observed in capacity tests and associated factors. Some evidence for biological and psychological factors existed showing an ambiguous association with capacity results, but there was also conflicting evidence in this area. High level of evidence for social factors was not evident.

One of the benefits of using the ICF coding scheme was the clear identification of gaps of knowledge in the field of FCE. In a different Delphi study, 33 researchers, clinicians, and patients from nine countries were asked to identify and systematically rate their views of the determinants of performance (Lakke et al. 2012). After identification of determinants, which were coded according to the ICF, participants were asked to rate the importance of these factors. At the end, participants reached consensus on six factors that can influence the outcome of the lifting test as a case in point: catastrophic thoughts and fear, patient adherence to "doctor's orders," internal and external motivation, muscle power, chronic pain behavior, and avoidance behavior. Motivation, chronic pain behavior, and sensation of pain were the top three factors affecting postural tolerance and repetitive movement functional capacity tests.

6.5.5 Conclusions: Added Value of the ICF

In summary, the ICF can provide a conceptual framework to describe, examine, and understand the impact and burden of disease on an individual worker and his/her work using the broad holistic and biopsychosocial perspective of the ICF, in addition to the traditionally used biomedical model (pathology-etiology model). With the ICF, we have a classification system that is able to capture and measure the complex functioning domains of VR and RTW. The ICF helps in the conceptualization and thought process of understanding work-related burden and it also guides clinical and vocational decision-making process and ultimately effective clinical care and rehabilitation in the context of VR and RTW strategies.

6.6 Appendix: Work Rehabilitation Questionnaire (WORQ). Retrieved from www.myworq.org



Functioning Questionnaire in Vocational Rehabilitation (FQVR)

Name or ID.Number: Interview date (MM/DD/YY):

This questionnaire has been developed to better understand the extent of problems in functioning that people may have due to their health conditions and who are undergoing vocational rehabilitation.

PLEASE READ ALOUD THE INSTRUCTIONS AND THE QUESTIONS BELOW TO THE PATIENT
"I would like to review different functions of your body and activities of daily life. When answering these questions, I would like you to think about the **past week**, considering both your good and bad days. When I ask about problems, I would like you to consider what is the extent of the problems you have had, on average, in the past week. By problem, I mean that you require increased effort doing an activity, that you have discomfort or pain, or that doing an activity is slower than usual, for example. Make sure that your answer refers to your ability to do the activity without any help from anybody.

Even if you experience no problems in certain functions or activities, it is necessary that I ask all of the questions for completeness. I will begin by asking you some background information.

BACKGROUND INFORMATION/ SOCIO-DEMOGRAPHIC Questions

1. Age (in years) ☐ years
2. Sex ☐ female ☐ male
3. Civil status ☐ never married ☐ married ☐ separated ☐ divorced ☐widowed ☐ cohabitant ☐ other
4. Number of children ☐
5. What is your current job (job title)?

6. What kind of business, industry or service is your job in? (e.g., cardboard box manufacturing, road maintenance, retail shoe store, secondary school, dairy farm, municipal government)

7. What kind of work were you doing? (e.g., babysitting in own home, factory worker, forestry technician)

8. What were [your] most important activities or duties? (e.g., caring for children, stamp press machine operator, forest examiner)

9. If a change of job is planned, what will your future job be? ☐ Not applicable

10. Which describes your current work status?
☐ employed ☐ self-employed ☐ non paid work such as volunteer or charity ☐ student or in training
☐ homemaker ☐ retired ☐ not working due to health reasons
☐ not working due to other reasons: Specify

11. If currently employed or self-employed, are you: ☐ Full time ☐ Part time ☐ On modified or light duty

12. If not working, in your previous job, were you: ☐ Full time ☐ Part time ☐ On modified or light duty

13. If not working, since when were you off from work? (MM/DD/YY):

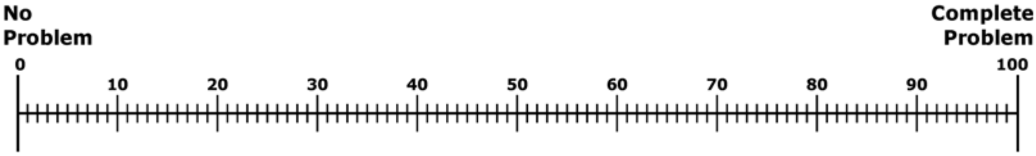
14. What kind of work intervention or vocational intervention do you have now? (list as many as you can)
(e.g., physical training, cognitive training, vocational counseling, vocational evaluation, vocational training, internship etc.)

15. Do you get the support you need from the labor and employment system? ☐ Yes ☐ No ☐ Not applicable
(e.g., finding suitable work when unemployed or looking for a different work?). If yes, please specify:

16. Are you in medical or therapeutic treatment? ☐ Yes ☐ No ☐ Not applicable
(e.g., with physician, therapists, etc.)? If yes, please specify:

17. Do you have current restrictions?
(e.g., lifting limited to 5kg, limited weight bearing in an extremity)

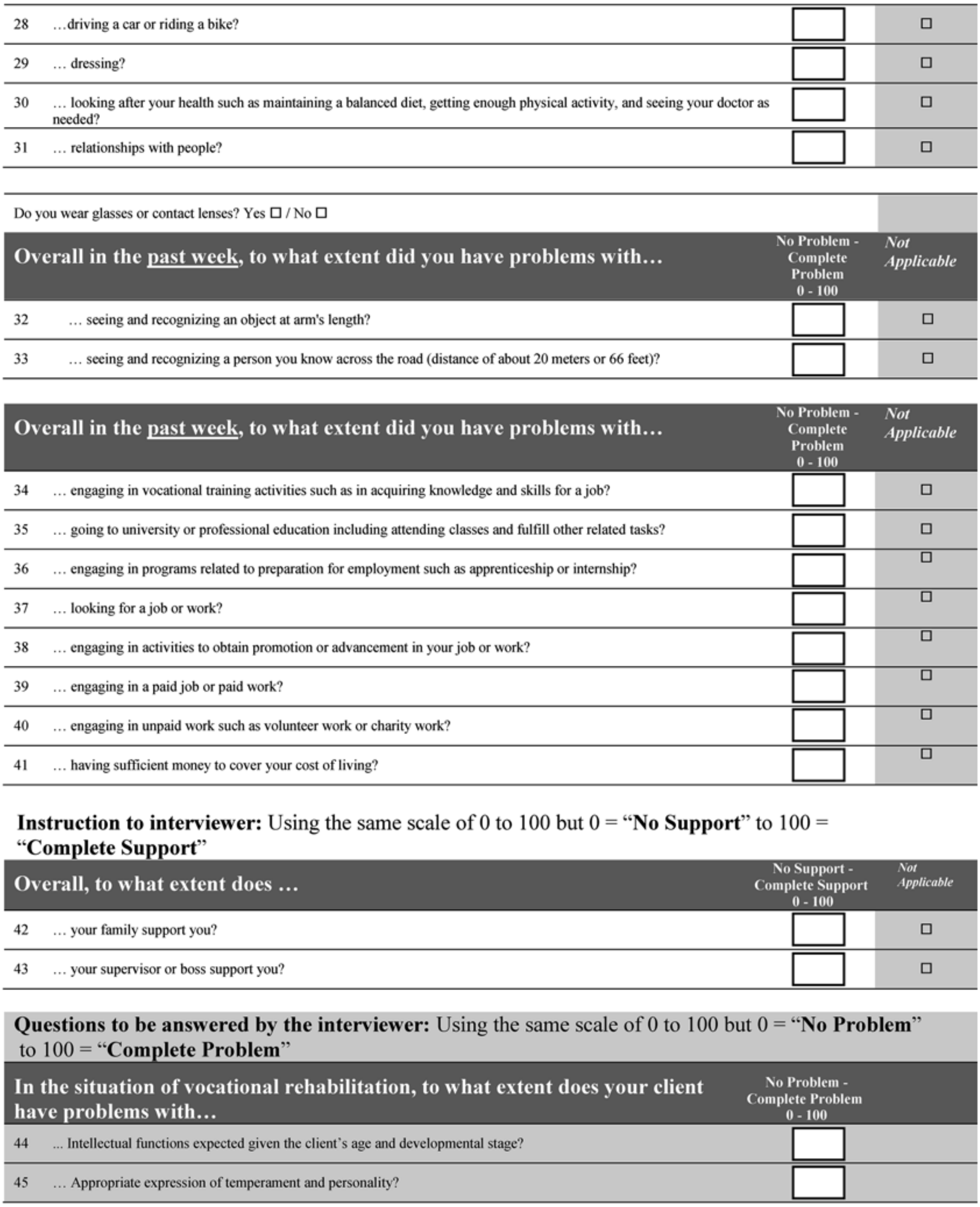
Instruction to interviewer: SHOW SCALE TO RESPONDENT (scale is also available as a separate visual handout)



Let us begin...

	Overall in the <u>past week</u>, to what extent did you have problems with…	No Problem - Complete Problem 0 - 100	*Not Applicable*
1	…feeling rested and refreshed during the day?		☐
2	… sleeping, such as falling asleep, waking up frequently during the night or waking up too early in the morning?		☐
3	…remembering to do important things?		☐
4	…your usual daily activities because you felt sad or depressed?		☐
5	…your usual daily activities because you felt worried or anxious?		☐
6	…thinking clearly?		☐
7	…analyzing and finding solutions to problems in day to day life?		☐
8	…hearing?		☐
9	…keeping your balance while maintaining a position or during movement?		☐
10	…bodily aches or pains?		☐
11	…general endurance when performing physical activities?		☐
12	…muscle strength?		☐
13	…skin problems, such as broken skin, ulcers, bedsores and thinning of skin?		☐
14	…learning a new task (e.g., learning how to get to a new place, learning a new game, learning a new recipe etc.)?		☐
15	…focusing attention on a specific task, filtering out distractions such as noise?		☐
16	…reading?		☐
17	…making decisions?		☐
18	…starting and completing a single task such as making your bed or cleaning up your desk or workplace?		☐
19	…carrying out your daily routine or day to day activities?		☐
20	…handling stress, crises, or conflict?		☐
21	…understanding body gestures, symbols and drawings?		☐
22	…starting and maintaining a conversation?		☐
23	…using communication devices such as using a telephone, telecommunication devices, and computers?		☐
24	…lifting and carrying objects?		☐
25	…fine hand use such as handling objects, picking up, manipulating and releasing objects using the hand, fingers, and thumb?		☐

	Overall in the <u>past week</u>, to what extent did you have problems with…	No Problem - Complete Problem 0 - 100	*Not Applicable*
26	…moving around including crawling, climbing, and running?		☐
27	…using transportation as a passenger ?		☐



28	…driving a car or riding a bike?		☐
29	… dressing?		☐
30	… looking after your health such as maintaining a balanced diet, getting enough physical activity, and seeing your doctor as needed?		☐
31	… relationships with people?		☐

Do you wear glasses or contact lenses? Yes ☐ / No ☐

	Overall in the <u>past week</u>, to what extent did you have problems with…	No Problem - Complete Problem 0 - 100	*Not Applicable*
32	… seeing and recognizing an object at arm's length?		☐
33	… seeing and recognizing a person you know across the road (distance of about 20 meters or 66 feet)?		☐

	Overall in the <u>past week</u>, to what extent did you have problems with…	No Problem - Complete Problem 0 - 100	*Not Applicable*
34	… engaging in vocational training activities such as in acquiring knowledge and skills for a job?		☐
35	… going to university or professional education including attending classes and fulfill other related tasks?		☐
36	… engaging in programs related to preparation for employment such as apprenticeship or internship?		☐
37	… looking for a job or work?		☐
38	… engaging in activities to obtain promotion or advancement in your job or work?		☐
39	… engaging in a paid job or paid work?		☐
40	… engaging in unpaid work such as volunteer work or charity work?		☐
41	… having sufficient money to cover your cost of living?		☐

Instruction to interviewer: Using the same scale of 0 to 100 but 0 = "**No Support**" to 100 = "**Complete Support**"

	Overall, to what extent does …	No Support - Complete Support 0 - 100	*Not Applicable*
42	… your family support you?		☐
43	… your supervisor or boss support you?		☐

Questions to be answered by the interviewer: Using the same scale of 0 to 100 but 0 = "**No Problem**" to 100 = "**Complete Problem**"

	In the situation of vocational rehabilitation, to what extent does your client have problems with…	No Problem - Complete Problem 0 - 100
44	... Intellectual functions expected given the client's age and developmental stage?	
45	… Appropriate expression of temperament and personality?	

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Overcoming Barriers to Recovery and Return to Work: Towards Behavioral and Cultural Change

7

Sir Mansel Aylward

7.1 Introduction

There are some fundamental precepts upon which the material of this chapter is based. Specifically:

- The main determinants of health and illness depend more upon lifestyle, sociocultural environment, and psychological (personal) factors than they do on biological status and conventional health care (Marmot 2004);
- Work is the most effective means to improve the well-being and health of people, their families and their communities (Waddell and Burton 2006); and
- Barriers to a life in work should be rigorously tackled and removed by society as a whole.

Sickness-related absence from work and sickness impairing work and productivity are major problems in all industrialized countries (Aylward and Sawney 2006). Moreover, despite improvements in health care, and most objective measures of population health in the UK (Lopez et al. 2006, Wanless 2003), people's sense of general health and well-being has not improved since the 1950s (Barsky 1988; Layard 2005). This paradoxical observation is not confined to the UK (Waddell and Aylward, 2010). It may be argued that a growing number of people seem less able to cope with health problems and suffer more chronic disability than ever before (Aylward 2006; Le Fanu 1999). Psychological, social, and cultural factors clearly aggravate and perpetuate ill health and disability (Lightman 2005; Steptoe 2005; Waddell 2002). These act as obstacles to recovery and barriers to return to work (Nimnuan et al. 2001, Waddell and Burton 2004). At this time, when health-related work absences continue to increase, there is a pressing need to identify and successfully address these obstacles and barriers to (return to) work rather than reducing sickness and disability to a personal pathology. In the UK, for example, the great majority of people in receipt of state work-incapacity benefits[1] and very many patients who consult their general practitioners (GPs) report nonspecific and subjective health complaints as the reasons why they are unable to work. Yet paradoxically these common health problems have a high prevalence in the general population who remain at work (Aylward 2004; Buck et al. 2008; Wessely 2004). For these people, it may be argued, sick-

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[1] Initially Invalidity Benefit, replaced by Incapacity Benefit from April 1995, then Employment Support Allowance from October 2008. Claimants and their characteristics remain broadly the same.

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ness and incapacity for work are determined more by personal (psychological), social, and cultural issues other than a medical one. Addressing these trends depends on better understanding of sickness and disability (Aylward and LoCascio 1995).

In the UK, the number of people on incapacity benefits[1] increased from about 700,000 in 1979 to 2.6 million in 1995 (Aylward 2004, Department of Health 2005). Since then, it has plateaued, but has remained stubbornly high. An increasing proportion of people receiving state incapacity for work benefits report "common health problems" that mainly comprise musculoskeletal symptoms and mental health problems which are not always supported by recognizable evidence of underlying disease (Waddell and Aylward 2005). Ill health in people of working-age is estimated to cost the UK Government £100 billion per annum, which emphasizes the pressing need for a more flexible model of the relationships between health and work and a more proactive approach to rehabilitation (Black 2008).

Box 7.1 Concepts of ill health and their differentiation

Disease	Objective, medically diagnosed, pathology
Impairment	Significant, demonstrable, deviation or loss of body structure or function
Symptoms	Bothersome bodily or mental sensations; generally bothersome or of concern to the person aware of them
Illness	The subjective feeling of being unwell
Disability	Limitation of activities and restriction of participation
Sickness	A social status accorded to the ill person by society
Incapacity (work)	Inability to work because of sickness or disability

Reproduced with permission from Waddell and Aylward, Models of Sickness and Disability, Royal Society of Medicine Press, 2010

7.1.1 Challenging Conventional Assumptions: Disease, Sickness and Disability

The unfortunate and loose use of words such as "ill," "sick," "disease," and "disabled" as if they were interchangeable causes great confusion. This lack of precision contributes to the paradoxical observation of increasing levels of reported illness versus general improvement in population heath in the more developed countries. It is imperative that we have clear definitions and understanding of these fundamental concepts (Boyd 2000; Hofman 2002; Twaddle and Nordenfelt 1994). Their more precise definition and differentiation are offered in Box 7.1.

An accurate interpretation of these concepts is fundamental to defining entitlement to work-related benefits in many social security and insurance systems and for the assessment of work (in) capacity per se (Aylward and Sawney 1999). Diagnosis alone provides little information about (in)capacity for work (Aylward and LoCascio 1995). Impairment is a biomedical definition—it provides the most objective measure of a health condition, but does not give much information about the experience of the individual. Sickness and disability are social definitions, which focus on the individual's experience and functioning, and not just the health condition. "Disability" is not synonymous with incapacity: in the UK, about half of all disabled people are working, including 25 % of those who say that their limitations are severe (OECD 2003). Most importantly, the reporting of symptoms does not necessarily mean illness or incapacity for work. Symptoms, disability and incapacity for work must therefore be distinguished, conceptually, in unravelling the aforementioned paradox, in assessment of functional capacity and as the basis for sick certification and work-related benefits.

7.1.2 Symptoms and Common Health Problems

Symptoms may be defined as "*subjective bodily or mental sensations that reach awareness and* *are generally bothersome or of concern to the person who experiences them"* (Waddell and Aylward, 2010). They manifest as clinical representation and manifestation of disease but may well be associated with normal or, more commonly, unaccustomed activities of daily living in healthy persons. They may not be readily and reliably associated with any identifiable disease and are ubiquitous and omnipresent in society (Buck et al. 2008; Deyo et al. 1998; Eriksen et al. 1998; Ursin 1997). Moreover there is a limited correlation between their expression and illness, disability and (in)capacity for work (Waddell 2004; Waddell and Aylward 2005).

Common health problems may be perceived as "less severe" but that does not mean that they are less important for those people who experience them. These symptoms are very real, justify health care and may cause temporary limitations. Nevertheless, they are called "common health problems" on the basis that they are similar in nature and sometimes even in degree to the bodily and mental symptoms experienced at times by most adults of working age. The results of a survey of 1000 adults undertaken in the UK (Buck et al. 2008) are given in Table 7.1. That study sought responses to an "open question" followed by a structured inventory to document the nature and extent of commonly encountered health problems in the working-age population surveyed.

Table 7.1 Prevalence of common health problems in UK adults in the Cardiff Health Experiences Survey

	Male (%)	Female (%)
Open question:		
Musculoskeletal problems	11.7	14.0
Mental health problems	4.8	8.7
Other problems	9.4	15.2
Inventory of common "symptoms":		
Musculoskeletal	24.6	34.0
Mental health	18.1	28.8
Other	26.0	42.7

On specific questioning, 66.4 % reported at least one (usually mild or moderate) symptom. In open response, 28 % reported "problem(s)," but these were usually more severe

Responses to open questions about health (without prelabelling and using non-medicalized terminology) and to an inventory of common symptoms. Reproduced with permission from Waddell and Aylward, Models of Sickness and Disability, Royal Society of Medicine Press, 2010

When patients seek medical advice for these symptoms, diagnosis is often nonspecific; the symptoms are not assignable to a particular cause, condition, or category (ODE 2005). Such diagnoses are often "nominal" in that they are simply labels. But the illusion that they are well understood can be misleading and cause iatrogenic harm. These health problems are characterized more by symptoms and distress than by consistently demonstrable pathology (Barsky and Borus 1999). A number of diverse terms have been used to categorize them: "subjective health complaints" (Ursin 1997), "symptom-defined illness" (White 2005), or "medically unexplained symptoms," which emphasize the limited evidence of objective disease or impairment (Page and Wessely 2003). In a clinical sense, they are recognizable but only in terms of bodily or mental function and physiological disturbance, rather than disease or permanent impairment. Patients commonly seek and doctors regularly issue sick certificates endorsing absence from work for subjective health complaints. Family doctors in the UK are well aware of these predicaments and the conflicting roles many of them may have to play in the medical consultation (Chew and May 1997; Cohen 2008).

Waddell and Burton (2004) gave common health problems the following characteristics and argued that they are insufficient *in themselves* to explain long-term incapacity:

- Objective evidence of disease or permanent impairment is unusual;
- They have a high prevalence in the general (working) population;
- Most acute episodes settle quickly—at least sufficiently to permit a return to most normal activities, even if some symptoms persist or recur;
- Most people with these common problems remain at work, and the great majority of those who take sickness absence return to work quickly; and

- Overall, only about 3 % of episodes of sickness absence associated with common health problems go on to long-term incapacity.

Evidently, these are manageable health problems: recovery to optimal functioning is to be expected provided that proper advice and support are given and received. *Long-term incapacity for work is thus not inevitable*. Consequently, a conceptual and practical distinction exists between largely subjective common health problems and objective disease.

7.1.3 Benefit Dependency and Common Health Problems

Workers' compensation and social security systems were originally designed for people with severe medical conditions and permanent impairment. Nevertheless, in the UK such conditions account for less than a quarter of long-term sickness absence from work, and their prevalence has been stable for many years (Waddell and Aylward 2005). About two-thirds of long-term sickness absence and ill-health retirement are now due to common health problems (Black 2008; Sissons et al. 2011; Waddell and Burton 2004).

Sissons et al. (2011) reported the findings of a two-wave survey of people who claimed the UK's Employment and Support Allowance (ESA) between April and June of 2009. This research examined the characteristics of ESA claimants and explored the employment trajectories over approximately 18 months. ESA claimants were slightly older than the general population of working age and were more likely to be male. The main health conditions among ESA claimants at the baseline survey are listed in Table 7.2.

Table 7.2 Common health problems as reported causes of long-term sickness in 2945 respondents presenting with health conditions at baseline (Sissons et al. 2011)

Reported causes	Percentage (%)
Musculoskeletal condition/injury	37
Mental health condition	32
Long-term systemic condition	16
Don't know/prefer not to say	2

The prevalence of musculoskeletal problems (37 %) and mental health conditions (32 %) varied considerably by demographic characteristics: mental health conditions were more common among women and younger people while musculoskeletal conditions more common among men and older people. In the survey population, multiple health problems and fluctuating conditions were reported by 66 and 55 % of the respondents, respectively. In those who were working prior to claiming ESA, 72 % had a physical health condition dominated by musculoskeletal conditions; in 50 %, the health condition was of recent origin and 27 % of these conditions were attributed to work and they were mainly men that were associated. By contrast, among those claimants who were not working before their claim, mental health conditions (38 %) were most commonly reported and tended to be long-standing. Only a minority (11 %) considered their health condition as work-related. Not unexpectedly, in those with non-work backgrounds, 25 % had literacy difficulties and 28 % were in a disadvantaged group. Moreover, the survey findings identified improvements or stability in health as pivotal to a return to work. Attitudes to work were important influences on the likelihood of return to work. Encouraging people in the belief that work assists their health is thus more likely to achieve a successful return to work.

These findings support the observations of Waddell and Aylward (2010) that among those in receipt of UK long-term incapacity benefits, musculoskeletal (18–20 %) and mental health conditions (40–44 %) dominate. If recipients with a secondary mental health condition are included, these statistics rise to more than 50 %.

While health is a pivotal factor influencing return to work, other factors, such as skills and qualifications, social disadvantage, beliefs in the benefits of working, and distance from the labor market are among the important factors in explaining future employment trajectories.

Shiels et al. (2004) reported that common mental health problems and musculoskeletal conditions represent 40 and 23 %, respectively, of sick certification among general practitioners in the UK. Common mental health and musculoskeletal problems in people on long-term sickness absence from the workplace are respectively the leading cause in non-manual and manual workers (CBI/AXA, 2007; CIPD 2007). Ill-health retirement, mental health and musculoskeletal problems are by far the most prevalent and in some schemes accounted for more than 80 % of the reasons for early retirement (Waddell and Aylward 2010).

7.1.4 Barriers: Negative Influences on Return to Work

Many disability benefit recipients are not completely incapacitated but still retain (some) capacity for (some) work. Most benefit claimants have a genuine health condition, and many genuinely believe that they cannot or should not work. These beliefs are often reinforced by medical advice (Anema et al. 2002; Sawney 2002), by employers who will not permit return to work until symptoms are "cured" (James et al. 2002) and by the benefits system (Fordyce 1995; Waddell and Aylward 2005). Virtually all claimants say that illness or disability affects their ability to work, and about three-quarters report that it is the main reason they are not working or seeking work. However, less than one in four claimants report that they could not do any work at all. Ninety percent of new incapacity benefit claimants initially expect to return to work in due course and one-third to one-half of all recipients still want to work. All of these figures are based on what people say, subject to all the qualifications of self-report (Aylward and Sawney 2006).

7.1.5 The Psychosocial Dimension

How people think and feel about their health problems determines how they deal with them and what their impact is (Mechanic 1968). There is extensive clinical evidence that beliefs and psychological factors aggravate and perpetuate the course and outcome of human illness (Gatchel et al. 2007; Gatchel and Turk 2002; Halligan and Aylward 2006; Linton 2002; Main et al. 2008; White 2005) and in the more subjective health problems person's beliefs exert a major influence (Main and Spanswick 2000). Psychological factors influence when common bodily or mental symptoms become a "health problem" (Mechanic 1968) and when sickness absence is taken (Alexanderson and Norlund 2004). They strongly influence the process of recovery (Mondloch et al. 2001) and rehabilitation (BSRM 2000), the return to work (Krause et al. 2001) and the duration of long-term incapacity (Waddell and Aylward 2005). It must not be forgotten that psychological factors affect the nature and course of all illnesses, including the manifestations of severe medical conditions. Nevertheless, they are particularly important in common health problems where the more nonspecific and subjective the health condition, the more important role they play (Wormgoor et al. 2006). Functional capacity may be limited by a health condition, but performance is limited by how the person thinks and feels about that health condition (Nordenfeldt 2003).

Some personal characteristics and psychological processes are deeply rooted in, or beyond the control of the individual, but conscious choice, motivation and effort may still exert a pivotal role in sickness and disability (Aylward 2003; Halligan et al. 2003; Leonard et al. 1999). Human beings may be driven by both self-interest and altruism, but self-interest is often dominant. Nevertheless, and the pragmatic stance taken by the law in many jurisdictions, is that choice, free will and personal responsibility for one's actions are taken to be the norm unless there is strong evidence to the contrary (Gordon 2000). Choice, however, may be restricted by genuine (even if mistaken) perceptions and beliefs, and by social or occupational factors. Decisions about being (un)fit for work, taking sickness absence or claiming benefits are nonetheless generally taken to be conscious decisions.

Among the psychological factors that do influence sickness absence and return to work, perceptions of health and its relationship to work appear to be the most important. These are:

- The subjective experience of illness and disability may not be reflected in objective findings.
- Beliefs, attitudes, and thereby expectations expressed by the person and family, health professionals, and employers may interact and reinforce each other.
- Moods, emotions, values, goals, coping strategies, and uncertainty.
- Resilience, motivation, and effort.
- Psychological distress, anxiety, depression, fear, and risk avoidance.

The relative importance and impact of these influences will vary in different individuals and settings, and over time (Waddell and Aylward 2010).

Although the emphasis is usually on the person's attitudes and beliefs, this is equally relevant to attitudes of health professionals and employers, which may significantly reinforce illness behaviors. Attitudes and beliefs about work and health can be listed as follows:

- Individual perceptions of physical and mental demands of work.
- Low job satisfaction and limited attendance incentives.
- Lack of social support at work (coworkers and employer).
- Attribution of health condition to work.
- Beliefs that work is harmful and that return to work will do further damage or be unsafe.
- Low expectations about return to work.

Organizational policy, process, and practice-related factors include the following:

- Inappropriate medical information and advice about work.
- Sick certification practice.
- Lack of occupational health support.
- Employers' beliefs and fears of worker's reinjury and liability associated with demanding the restoration of full fitness before permitting return to work.

Table 7.3 Negative influences on return to work: principal barriers elicited in study population ($N = 1294$)

Principle barriers	%	Rank
Psychological/cognitive	38	1
Workplace	32	2
Social	11	3
Economic	9	4
Symptom perception (pain, fatigue, etc.)	7	5
Impairment	3	6

In an exploration of the negative influences on return to work among a cohort of people who had been absent from work for between 2 weeks and 3 months because of a reported health problem, only 10 % admitted that the barrier to return to work was due either to impaired function or symptoms they continued to experience (Aylward 2010). By far the most common reasons people gave why they were not returning to work were psychological or workplace issues (Table 7.3). The most commonly elicited negative influences on return to work were false beliefs about their presenting health problem, low self-efficacy, and poor relationships with their line-manager/supervisor.

The exercise was not intended to document positive influences, which would aid return to work but the following factors strongly emerged:

- Respect for employer.
- Job satisfaction.
- Strong health literacy.
- Positive attendance incentives (especially work colleagues).
- Well managed chronic health condition.

Dominating positive attendance incentives were perceptions of posing extra burdens on work colleagues and rejoining a friendly team at work. These findings reemphasized that barriers to return to work are primarily personal and psychosocial rather than medical problems and that workplace culture and organizational features play a substantial role.

7.2 The Relationship Between Work and Health

Work forms a large part of most people's lives bringing a range of benefits to individuals, in addition to the financial benefits of a wage and pension. Work can provide people with a sense of dignity, purpose, opportunities for social interaction, develop new skills and give something back to the community; all of which can help boost an individual's confidence and self-esteem. In short, work allows full participation in our society. In a broad sense, however, work does need to be for financial gain: voluntary or charity work brings many of the non-financial benefits of employment. This aspect of rewarding work is particularly pertinent when jobs are no longer for life and many people may choose or need to work for longer.

It does not necessarily follow that an illness, injury, or disability results in an inability to work. Examples are the legion of people who work despite severe illness or disability. People with disabilities who want to work should be given all the opportunities, encouragement and support to do so. As emphasized earlier, far too often health professionals and others have associated the occurrence of an illness, injury, or disability with being unable to work.

Work and health are intimately related. Health is not always a necessary condition for work, and work is not always a risk factor for health. There is now strong evidence that work is generally good for health, and that the beneficial effects of work outweigh the risks of work and the harmful effects of a life devoid of work (Black 2008; Waddell and Aylward 2010; Waddell and Burton 2006). Certainly, the beneficial effects of work depend on the nature and quality of that work and its social context and, importantly, reverse the adverse effects of unemployment. Furthermore, and most pertinent to policies and practices which focus primarily on tightening gateways into sickness-related benefits, the evidence is compelling that moving people off benefits without entry in to work is associated with deterioration in health and well-being (Waddell and Burton 2006).

The effects of unemployment in terms of health are thus now recognized. Unemployment causes poor health and health inequities, and this effect is still seen after adjustment for social class, poverty, age, and preexisting morbidity (Waddell and Burton 2006). A person signed off-work sick for 6 months has only a 50 % chance of returning to work. By 1 year it is 25 % and by 2 years about 10 % (Waddell and Aylward 2010). One study showed that after 6 months off-work due to ill health the majority of people were suffering from depression, whatever the initial presenting problem. Most importantly, regaining work may reverse these adverse health effects and reentry into work leads to an improvement in health (Waddell and Burton 2006). Long-term worklessness is one of the greatest risks to public health (Black 2008; Waddell and Aylward 2010). It has been argued as a compelling illustration of the health risk associated with long-term dislocation from the world of work that it is of a magnitude equivalent to smoking ten packs of cigarettes per day (Ross 1995).

Although these findings reinforce the economic, social, and moral arguments that work is the most effective way to improve the well-being of individuals, their families and their communities, the conditions for that are:

- Jobs are available.
- There is a realistic chance of obtaining work, preferably locally.
- Allowance is made for age, gender and (lack of) qualifications.
- Jobs are "good jobs" from the perspective of promoting health and well-being.

Although it is right to consider the health consequences of exclusion from a working life and unemployment, too many people are still injured or made ill as a result of their work. Unsafe working conditions may be a direct cause of illness and poor health. Improvements in health and safety risk management must continue unabated to prevent much avoidable sickness and disability arising in the workplace. This improvement leads to a broader and more balanced view of the relationship between work and health. It also means that health and safety at work should be distinguished. Safety will always be important, but a healthy working life is much more: it is "one that continuously provides the opportunity, ability, support and encouragement to work in ways and in an environment that allows workers to maintain and improve their health and well-being" (Scottish Executive 2004).

Thus, there are profound implications for the provision of advice about work and for sick certification. Sick certification is a powerful therapeutic intervention, with potentially serious adverse consequences if applied inappropriately; not the least of which is the drift into long-term incapacity (Anema et al. 2002; Sawney 2002).

7.2.1 Models of Disability and Sickness: Tackling Barriers to Recovery and Return to Work

Models are a practical approach to moving from theory to reality (Llewellyn and Hogan 2000; McLaren 1998,) and a means of aiding understanding, research and management. There are strengths and limitations in adopting the traditional "medical model" which may be summarized as a mechanistic view of the body, in which illness is simply a fault in the machine that should be fixed. Its principal focus on pathology and its treatment (Virchow 1858), leads it to be understood as a *disease model* or *biomedical model*. Symptoms are taken to imply incapacity, so sickness absence is considered necessary and justified until full recovery (the complete relief of symptoms).

Disability groups in the UK have rejected the medical model and proposed an alternative "social model of disability" (Finkelstein 1980; Oliver 1983). It is argued that many of the restrictions experienced by disabled people do not lie in the individual's impairment but are imposed by the way society is organized for able-bodied living. Society fails to make due allowance and arrangements that would enable disabled people to fulfil the ability and potential they do have. Social models and the role of personal and psychological factors provide a better understanding of sickness and disability. They also impact on capacity for work and aid developing interventions aimed at facilitating return to optimal function and work. Social models shift the focus from the individual to society and champion the empowerment of disabled people: social restructuring assumes paramount importance and is the collective responsibility of society at large. The social model has profound implications in the provision of health care, for workplace management and social policy.

The social model approach necessitates change in the work environment and thus in the attitudes and behavior of employers, line managers and other workers. Individuals may be empowered to adapt the work environment to meet their needs, whereas other people may require education on these matters. The most powerful determinants of (ill) health are social gradients (Marmot 2004) and the linked problem of regional deprivation (Aylward and Phillips 2008; HMT 2003; McLean et al. 2005; Oxford Economics 2007; Ritchie et al. 2005).

Incapacity benefits cover diverse groups of people, with different kinds of problems, in very different circumstances. Nevertheless, many benefit recipients face multiple disadvantages and barriers to (return to) work (Waddell and Aylward 2005). Financial benefits unquestionably affect illness behavior. Work is fundamental to the family's socioeconomic situation, but in the circumstances brought by sickness or disability sick pay, social security, and workers' compensation, benefits may assume greater importance. Economic (dis)incentives do influence human behavior. However, the impact of economic incentives has been shown to be less than those of other drivers of behavior (Halpern et al. 2004; Waddell and Norlund 2000). Even more fundamentally, this economic model fails to recognize that some of the main drivers of sickness and disability are not financial but health-related and psychological.

7.2.1.1 The Biopsychosocial Model

Each of the above models poses a different perspective on disability and sickness, but each gives only a partial view. However, the biopsychosocial model of human illness is a more complete model, which recognizes and takes account of the person, their health problems, their social contexts, and the interactions among them, which can influence the course and outcome of disability and illness (Table 7.4). This model has profound implications for health care, workplace management, and social policy. Moreover, it acknowledges that a person's functioning depends on complex interactions among health status, environment, and personal factors, including attitudes and beliefs. Engel (1977; 1980) introduced the term "biopsychosocial" which shifted the focus from disease to illness and emphasized that health care must address the subjective experience of illness. This dynamic systems approach provides for better integration of body, mind, and social context and avoids the linear causality and factor analysis of the medical model. It recognizes that actions must be taken at both the individual and social levels. Interactions among these components of a complex system and between health and social well-being have been advanced as the major contributors to illness and to health (Buck et al. 2006; Gilbert 2002; Kiesler 1999). These are bidirectional in that social context influences sickness and disability, yet people can and do modify, select, and even create their social (and cultural) context (Llewellyn and Hogan 2000). Moreover, sickness and disability are dynamic systems that evolve over time.

The biopsychosocial model should not be taken to imply that psychosocial factors initiate an underlying health problem–although in a minority of contexts this causation can be activated by psychosomatic mechanisms. In general, psychosocial issues are better tackled after the health problem is addressed. The inability to diagnose pathology does not mean that the problem is a psychosocial one and neither does the manifestation of psychosocial factors exclude a genuine health problem. Moreover, undue emphasis on psychosocial factors can lead to the neglect of an underlying health problem and its appropriate diagnosis and treatment. Importantly, psychosocial factors must not be taken as diagnoses in themselves: rather, their identification necessitates more thorough appraisal of how an individual is affected by and deals with their health problem.

Table 7.4 Dimensions and interactions of the contemporary biopsychosocial model of human illness

Dimension	Interaction
Biological	Illness has at its basis biological functioning in body or brain whether or not recognized as a specific disease
Psychological	Illness is by definition subjective and invariably has a personal/psychological dimension
Social	Sickness and disability are social phenomena; illness is ultimately expressed in a social context

Sometimes application of the biopsychosocial model has focused almost invariably on a set of factors relevant to clinical psychology (e.g., cognition, mood and coping) neglecting what may be equally important less quantifiable influences on the personal and subjective experiences of illness and disability (e.g., expectations, perceptions and uncertainty). The "social" element of the model is rarely given the attention it merits and yet may well prove to be a dominating influence, which if not addressed may frustrate attempts at achieving successful outcomes.

The model must not be taken to imply that patients are the powerless victims of overwhelming psychosocial forces, which are beyond control. This notion fails to allow for free will, conscious choice, personal responsibility, and the possibility of exaggeration, abuse, or fraud (Aylward 2003). On the other hand, observer bias and a predetermined judgemental approach have to be avoided. The biopsychosocial approach also demands a more egalitarian patient–health care professional relationship (Borrell-Carrió et al. 2004).

The limited availability of validated tools to assess the role of psychosocial issues and practical interventions to tackle them is the greatest drawback to a more successful application of the biopsychosocial approach (Borkan et al. 2002; Kendall and Burton 2009; Kendall et al. 1997). There is a pressing need for more empirical evidence for biopsychosocial interventions at an individual level. Moreover, biopsychosocial problems are occasionally considered so complex that their effective management can only be undertaken by multidisciplinary teams. That is not so—patients with common health problems are well managed in primary care by adopting a few basic principles (Cohen et al. 2012a, b). Albeit, more difficult issues will need referral elsewhere and only the most complex cases will require a multidisciplinary team.

7.2.1.2 The Social Context

The most powerful determinants of illness and health are social gradients (Aylward and Phillips 2008, Marmot 2004, Ritchie et al. 2005). In the UK, there is a tenfold variation in the rates of receipt of work-incapacity and disability benefits between local authority areas which have the least and greatest disadvantaged and deprived populations. For example, the highest rates are found in the formerly heavily industrialized areas of south Wales, northern England, and central Scotland (Waddell and Aylward 2010). These areas of deprivation exhibit mortality rates, limited life expectation and years of freedom from disability and long-term illnesses which contrast most unfavorably with corresponding statistics found in areas where populations are the least disadvantaged Waddell and Aylward 2010.

One should be mindful of the adverse social context that burdens many people in receipt of work-incapacity benefits who face multiple disadvantages and consequent barriers to return to, or first entry into, a life in work (Waddell and Aylward 2005). Coexisting health problems are common, and secondary mental health problems frequently occur as the time out of work lengthens. In the UK, more than half of people in receipt of incapacity benefits have personal commitments that make entry into work more difficult (e.g., childcare responsibilities or caring for someone with chronic illness or disability). Low skills-even basic skills, poor employment histories and absence of academic and vocational qualifications in disadvantaged groups are commonly encountered. There exists a low-skills trap (Finegold and Soskice 1988; Rees and Stroud 2004) whereby a substantial proportion of the socially excluded population finds it extremely difficult to enter the labor market. Moreover, many trapped by low skills and in receipt of social security benefits cannot command a high enough wage to make work pay. In addition, employer discrimination remains a formidable barrier, especially for people with mental health conditions (Lelliot et al. 2008).

Uncertainty is a key issue: inability to enter regular work because of recurrent health problems, negative financial consequences of moving off benefits and into work and being labelled as incapable of work raise significant barriers and reinforce other barriers (Howard 2003; Waddell and Aylward 2005). Even if the health condition itself is not totally incapacitating, it is seriously compromised by these multiple disadvantages. These social aspects of the biopsychosocial approach are frequently neglected.

Alas, there is no simple solution to limiting these formidable barriers without addressing the social structure of society as a whole. But these social barriers must be identified, assessed on an individual basis, and where possible due allowance must be made for them. In this context, potential employers can play a cardinal role in avoiding discrimination, understanding the relationships between health and work, adjusting workplace environment, and adapting ways of working. If the social context is the principal barrier to a life in work, then addressing alone the health condition and psychological elements may well render access to or return to work a forlorn hope.

7.2.2 Workplace Management

A strong business case can now be made for the effective management of health at work (Black 2008; Burton et al. 2008; Hanson et al. 2006; Price Waterhouse Coopers 2008; Shaw et al. 2007). A focus solely on health care is inadequate: effective management must also address workplace matters and organizational features (Franche et al. 2005; Hill et al. 2007; HSE 2005; Lunt et al. 2007; Waddell et al. 2008). This notion signals the need to move from traditional “treatment" (i.e., health care) to a more all-embracing approach to the matter. Contemporary concepts of rehabilitation must follow a different logic to that adopted in the past (DWP 2004; Waddell and Aylward 2005; Waddell and Burton 2004).

In clinical practice, the concept of obstacles began with the consideration of factors that predict chronic pain and disability, and largely emphasized psychological influences. But these are only part of the picture. Notably, social security studies have largely focused more on social barriers to return to work (Waddell and Burton 2004). Biological, psychological and social obstacles are all important, albeit that there is interaction and overlap among the different dimensions, and their relative contribution may vary in different individuals and settings over time (Moon 1996). Thus, individual assessment of obstacles and barriers permits a problem-orientated approach that can:

- Guide clinical evaluation.
- Identify obstacles/barriers to recovery/return to work.
- Develop and introduce interventions to overcome these.
- Facilitate rehabilitation.

As common health problems are an inevitable part of (working) life, good workplace management is about preventing persistent and disabling consequences, which may include several overlapping strategies (Linton 2002; Shaw et al. 2002):

- Positive "health at work" strategies.
- Early detection and treatment of mild to moderate symptoms.
- Distinguishing temporary functional limitations from persistent or recurrent symptoms, and
- Interventions to minimize sickness absence and promote (early) return to (sustained) work.

The workplace as, indeed, health care should identify and address all health, personal, social, and occupational dimensions of health, identify barriers to (return to) work, and provide the support, opportunities, and encouragement to overcome them. Line managers play a key role in delivering this within the context of the employer's "duty of care" to their employees (Cohen et al. 2009, 2012a; Pransky et al. 2009). Sickness absence management, assisting return to work, and promoting rehabilitation are matters of good practice, good occupational management, sound business sense, and emphasize the need to ensure that work is safe and healthy (Buck et al. 2008, 2010; EEF 2004; HSE 2004).

7.2.2.1 Vocational Rehabilitation

The biopsychosocial model and the *International Classification of Functioning, Disability and Health* (WHO 2001) are now widely accepted as the best framework for disablement (Rondinelli 2007) and rehabilitation (HSE 2005; Lunt et al. 2007; Schultz et al. 2000; Wade and Halligan 2004; Wade and de Jong 2000). Vocational rehabilitation is best defined as *whatever helps someone with a health condition or disability to stay in, return to or move into work* (TUC 2000).

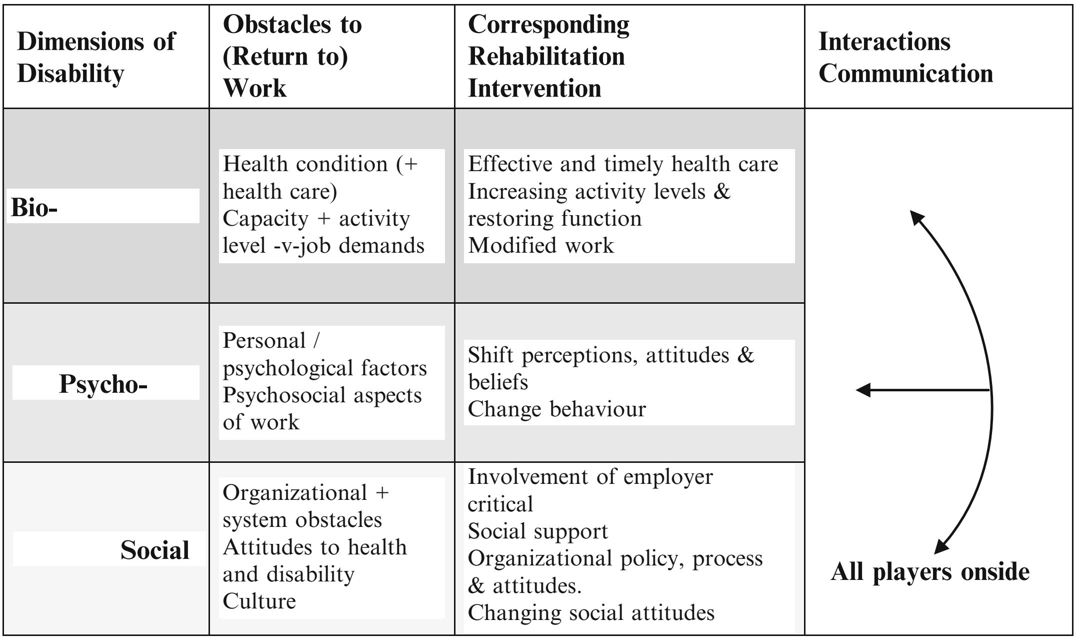
The traditional approach to rehabilitation as a secondary intervention after medical treatment accepts that impairment is irremediable, and attempts to overcome, adapt or compensate for it by developing to the maximum extent the patient's (residual) physical, mental, and social functioning. Where appropriate, patients may be helped to return to (modified) work. That approach remains valid for some severe medical conditions (Wade and de Jong 2000). However, in tackling common health problems the approach to rehabilitation requires a different logic. Rather, recovery and restoration to optimal functioning should generally be expected, even if there remain some persisting or recurrent symptoms. As explained earlier in this chapter, focusing exclusively on health care is inadequate: effective management must also incorporate workplace matters and organizational features (Franche et al. 2005; Hill et al. 2007; HSE 2005; Lunt et al. 2007; Waddell et al. 2008).

Biopsychosocial factors aggravate and perpetuate sickness and disability; crucially, these factors can continue to act as obstacles or barriers to recovery and return to work. The paradigm for effective rehabilitation then shifts from dealing with residual impairment to addressing the biopsychosocial elements that delay or prevent expected recovery and return to work (Burton and Main 2000; Howard 2003). The very same principles underpin job retention, return to work and reintegration, and are equally applicable to the general management of sickness and disability, whatever their causes. There is a strong and growing evidence base for many aspects of vocational rehabilitation (Waddell et al. 2008) and more evidence on the realization of cost-benefits than for many health and social policy areas (Black 2008; Waddell et al. 2008).

The concept of early intervention is central to vocational rehabilitation: the longer anyone is off work, the greater are the obstacles to return to work and the more difficult vocational rehabilitation becomes. It is simpler, more effective and cost-effective to prevent people going on to long-term sickness absence, Fig. 7.1.

Return to work should be one of the key outcome measures for health care and workplace management. A "stepped-care approach" allocates finite resources most appropriately and efficiently to meet individual needs (Freud 2007; von Korff 1999; von Korff and Moore 2001). In essence, the elements of this approach begin with simple, low-intensity, low-cost interventions that will be adequate for most sick or injured workers, followed by more intensive and structured interventions for those who need additional help to return to work.

Each stage involves a different set of expectations, behaviors and social interactions. The timing of health care, rehabilitation, and social interventions is critical. It is imperative that those of working age receive the help they need, when they need it. Clinical management of the majority of health complaints emphasizes the importance of restoring function as the best means of relieving symptoms. Most people recover rapidly and return to their normal activities and work; for them it may be argued that routine health care effectively does rehabilitate. For those who do not recover rapidly, health care and continued symptomatic treatment alone is not enough. In



Dimensions of Disability	Obstacles to (Return to) Work	Corresponding Rehabilitation Intervention	Interactions Communication
Bio-	Health condition (+ health care) Capacity + activity level -v-job demands	Effective and timely health care Increasing activity levels & restoring function Modified work	**All players onside**
Psycho-	Personal / psychological factors Psychosocial aspects of work	Shift perceptions, attitudes & beliefs Change behaviour	
Social	Organizational + system obstacles Attitudes to health and disability Culture	Involvement of employer critical Social support Organizational policy, process & attitudes. Changing social attitudes	

Fig. 7.1 Biopsychosocial obstacles to return to work with corresponding rehabilitation interventions. Reproduced with permission from Waddell and Aylward, Models of Sickness and Disability, Royal Society of Medicine Press, 2010

longer-term incapacity, the biological dimension and health care are only part, and often the least part, of the problem.

Waddell and Burton (2008) advocated separating clients into three broad types based principally on duration of the period off work. These groups will most likely have correspondingly different needs, which need diverse management approaches.

1. Up to 6 weeks off work.

   In the first 6 weeks or so, the very great majority of people with common health problems can be helped to remain at or return to work by adopting a few basic principles of health care and workplace management. The objective is to encourage and support health professionals and employers to implement these principles in practice.
2. Greater than 6 weeks off work.

   Symptomatic treatment alone is not likely to impact on work outcomes. At this stage, there is strong scientific evidence (particularly for musculoskeletal disorders) that effective interventions include:
   - Well-timed recognition of those requiring further support.
   - Allocation of responsibility for management.
   - Individual needs assessment.
   - Referral for opportune help.
   - Coordination of management and interventions.

     A case management approach is preferred, which incorporates evidence-based vocational rehabilitation interventions quality assurance and an emphasis on work outcomes.
3. 6 months and beyond.

   People in this group need interventions, which address the substantial personal and social barriers they face, including help with reemployment.

7.2.2.2 Cognitive–Behavioral and Talk Therapies

Attitudes, beliefs, and behavior can aggravate and perpetuate symptoms and disability; addressing these issues is an essential part of rehabilitation management. This principle seems to apply generally across all rehabilitation for physical and mental symptoms, stress, distress, and disability.

Behavior change is not a discrete event but a gradual process. The “stages of change model” Rollnick et al. 1999; Cohen et al. 2009) illustrates the process that an individual passes through towards behavioral change. Discussions with patients about behavior change are integral to health care practice (e.g., smoking cessation, weight reduction and diabetes management). Behavior change methods are now also applied to managing rehabilitation and return to work (Chang and Irving 2008; Cohen et al. 2012a, b). Most of these psychological and behavioral approaches now combine *cognitive–behavioral* principles (Linton 2002; Main and Spanswick 2000; Waddell and Aylward 2010), which tackle the illness experience in order to change beliefs, modify behavior and improve functioning. There is a growing body of evidence, which supports this methodology in tackling common health problems (e.g., Crombez et al. 1999, Vlaeyen and Linton 2000; von Korff 2005). Moreover, for people experiencing common mental health problems at work, brief individual therapy is most effective and cognitive–behavioral therapy (CBT) has been shown to be highly effective (Seymour and Grove 2005).

Motivational Interviewing (MI) is now recognized as an important method for engagement and compliance across many areas of health care (Rollnick et al. 1999). Alongside interventions, such as CBT, MI enhances engagement and motivation and is being adopted as an essential component of many effective rehabilitation programs.

7.2.3 UK Pathways to Work Program

In the UK, about three-quarters of those people in receipt of incapacity benefits say they would like to work (Waddell and Aylward 2010). These self-reports are not always a reliable indicator of the actual return to work rates when benefit recipients are offered quite comprehensive return to work support packages (Aylward et al. 2012). People's well meaning intentions and aspirations may be frustrated subsequently by a range of barriers, which were not evident when the question about likelihood of return to work was asked.

In the UK, the "Pathways to Work" program was launched in 2003. This program offered, in pilot areas of the country, enhanced support to those who were in receipt of a state incapacity benefit. This approach included specialist personal advisers, a series of six work focused interviews and a £40 per week return to work credit and a "Choices Package." Admission to the Choices Package was voluntary. The package's components included a Condition Management Program (CMP), delivered by the NHS, to help clients better manage their condition and to reduce the disability produced by chronic illness/injury. In 2006, the pilot programs were extended to cover the whole of Great Britain. This initiative brought some measure of success in doubling benefit recipients reentering work in some regions and was well received by both the claimants themselves and case managers. The key outcomes of the program were as follows (Aylward 2009; Ford and Plowright 2009):

- Most common benefits were increased confidence and ability to cope; significant improvements in confidence and coping were independent of changes in health status, associated with successful work outcomes;
- Rather than aiming for control of a health condition, successful outcomes were dependent on learning process towards self-management and independence;
- New roles for health professionals include support and guidance rather than therapy;
- Undue and mistimed emphasis on RTW had negative effects on engagement and outcomes;
- Evidence that improvements occurred despite unaltered or deteriorating health condition;
- The outcome of work was largely independent from other outcomes; however, work outcome was highly dependent on critical elements of the support and management package and the context in which it was delivered.

The Pathways to Work program was abandoned by the coalition government in 2011, though elements of this successful approach, notably condition management, have been retained in subsequent coalition government work program initiatives.

7.2.4 Social and Occupational Interventions

Employers have a key role if return to work is to be successful. Strong evidence supports a proactive approach by employers to attendance management that encompasses temporary provision of modified work and workplace adjustments as both effective and cost-effective (Black 2008). The primary goal is to facilitate an early return to work. Analysis of findings in empirical studies strongly supports modified work as an intervention that halved work days lost and the number of injured workers who went on to chronic disability (Krause et al. 1998). Health care interventions alone, which remove people from the workplace, could well impose a formidable barrier to the successful application of this approach.

For rehabilitation to be effective, there is strong evidence favoring the requirement for both work-focused health care and accommodating workplaces (Waddell et al. 2008). As emphasized earlier, an integrated approach with coordinated interventions is essential involving all key players across the health and work spectrum.

Lower levels of organizational performance are associated with higher levels of sickness presence and absence (Ashby and Mahdon 2010). Higher rates of sickness absence are also often associated with poor line management and support. The relationship between the line manager/supervisor and employee strongly influences employee well-being (Boorman 2009; Post et al. 2005). Effective communication between and among the principal players is an absolute prerequisite for a coordinated intervention (Beaumont 2003a, b; Sawney and Challenor 2003). This process demands common goals, understanding and language, which also facilitate training and organizational approaches that increase participation in decision making and problem solving (Cohen et al. 2012a, b). Such examples of improved communication are highly effective at reducing work-related psychological ill health and sickness absence (Michie and Williams 2003).

Policies and procedures to improve line management have been developed (Pransky et al. 2009). However, the quality of the conversation and the skillfulness required of line managers in undertaking the return to work conversation should not be underestimated. Being valued by the line manager and the organization are of high importance for employees and influences employees' attendance behaviors (Cohen et al. 2012a, b). A well-structured return to work program, agreed by both employee and employer, provides clarity and should manage expectations and facilitate the essential processes promoting effective attendance management. Addressing the psychosocial and interpersonal issues, which may confound a return to work may well be more important than modifying physical demands and job-related issues.

7.2.5 Work and Health: A Culture Shift

There is a pressing need to shift attitudes to work and health. Work and health are intimately related. This chapter attempts to demonstrate the complex relationships and interactions between the work environment and a person's health, which are consistent with the biopsychosocial model. As stated earlier in this chapter, the evidence is now extensive that the beneficial effects of work outweigh the substantial adverse effects on health brought by worklessness and the risks to health of work itself, providing that the work is "good" in promoting health and well-being as discussed earlier (Table 7.5). This notion considerably strengthens the economic, social, and moral arguments that work is the most effective means to improve the health and well-being of individuals, their families, and their communities.

Table 7.5 Health, work, and well-being (modified after Waddell and Burton 2006)

Work statement	Health impact
Work is generally good for health	Work is an integral part of life, central to an individual's identity, social roles and status and meets financial and psychosocial needs
	For people with common health problems, there is strong evidence that work: • Promotes recovery, return to optimal functioning, and rehabilitation • Leads to better health outcomes and subjective well-being • Limits the harmful physical, mental, and social effects of long-term absence from work • Enhances quality of life and well-being, and • Reduces social exclusion, disadvantage, and poverty
Worklessness is bad for health	There is strong evidence that long periods out of work can cause or contribute to: • A two to threefold increased risk of poor general health • A two to threefold increased risk of mental health problems • An increased risk of suicide • Around 20 % excess mortality, and • Higher consultation, medication consumption and hospital admission rates

These health risks are greater than those of many "killer diseases" and the risks associated with the most dangerous jobs in the construction industry or the North Sea

Rehabilitation needs to become more proactive and encompass the concept of prevention of long-term disability and work incapacity. This approach requires parallel interventions from health care and workplace rehabilitation. Furthermore, incorrect, commonly held assumptions must also be rigorously challenged to shift erroneous beliefs about health and work that:

- Rest from work is part of treatment—on the contrary, modern approaches to clinical management stress the importance of continuing ordinary activities and early return to work as an essential ingredient of treatment (Black 2008; Waddell and Aylward 2010).

- Patients should be 100 % fit before considering a return to work.

The significant number of people with health problems who enter into long-term incapacity for work is a tragedy for themselves, for their families and communities, for the economy, and for society as a whole. The evidence is now quite clear that the factors which underpin longer-term sickness and the failure to join the world of work are in the greater part personal and social rather than medical problems. These can only be understood and rigorously and successfully tackled by embracing a biopsychosocial intervention approach.

Although there is now sufficient knowledge to substantially limit sickness absence and long-term incapacity for work (Waddell and Burton 2004), the challenge remains of turning that knowledge into effective practices, targeted and validated interventions and achieving better health and well-being outcomes for all (Aylward et al. 2012). This unresolved issue presents us with a major public health challenge, which will only be resolved by a fundamental change in the ways we perceive and better understand the relationships between health and work, sickness and disability, and social determinants of heath and illness. Much sickness and work incapacity is preventable. The biopsychosocial model provides the framework and tools for achieving the desired change and better managing of a person's return to optimal function and work.

7.3 Conclusions

Much sickness and disability should be preventable, especially when they are due to common health problems, which may not be linked to any recognizable pathology and are ubiquitous and omnipresent in society. Moreover, these common health problems are insufficient in themselves to explain long-term incapacity for work. The unfortunate use of words such as "ill," "sick," "disease," and "disabled" as if they were interchangeable causes great confusion. This lack of precision contributes to the paradoxical observation of increasing levels of reported illness versus general improvement in population health in the more developed countries.

It is quite evident, however, that the management of health problems, whether common or otherwise, is not a matter for health care alone. A focus solely on health care is inadequate: effective management must also address psychosocial influences, together with workplace matters and its organizational features. This signals the need to move from traditional "treatment" (i.e., health care) to a more integrative approach to the matter.

Personal, psychological, social, and cultural factors aggravate and perpetuate ill health and disability; they also act as barriers or obstacles to recovery. Moreover, psychological factors influence when common bodily or mental symptoms become a "health problem." This situation leads logically to a biopsychosocial model of human illness that includes biological, psychological, and social dimensions, and the interactions among them that influence the course and outcome of any illness and thus may also act as barriers to recovery and return to work. Prolonged absence from normal activities, including work, is often detrimental to a person's mental, physical, and social well-being, whereas a timely return to appropriate work benefits the individual and his or her family by enhancing recovery and reducing disability.

An approach to rehabilitation based upon a biopsychosocial model is necessary to identify and address the obstacles to recovery and barriers to (return to) work. These barriers are primarily personal and psychosocial rather than arising solely from medical problems. The biopsychosocial approach should also meet the needs of those with common health problems who do not recover in a timely fashion, and identify the roles of key stakeholders. A person's return to function and work as soon as possible after an illness or injury should be encouraged and supported by employers, occupational and other health professionals, fellow employees, and rehabilitation service providers. Indeed, employers have a key role if return to work is to be successful. Strong evidence supports a proactive approach by employers to attendance management that encompasses temporary provision of modified work and workplace accommodations and adjustments as both effective and cost-effective. Successful rehabilitation is dependent on labor market opportunities, i.e., availability, quality, pay levels, and security of employment; as well as on personal capabilities related to the physical and psychological demands of work. A safe and timely return to work also preserves a skilled and stable workforce for employees and society, and reduces demands on health and social services, as well as on sickness absence schemes and disability payments.

The evidence is now extensive that the beneficial effects of work outweigh the substantial adverse effects on health brought about by worklessness and the health risks of work itself, providing that the work is "good" in promoting health and well-being. This evidence considerably strengthens the economic, social, and moral arguments that work is the most effective means to improve the health and well-being of individuals, their families, and their communities.

The most powerful determinants of illness and health are social gradients. Recognition must be given to adverse social circumstances that burden many people in receipt of work-incapacity and disability benefits who are challenged by multiple disadvantages and barriers to return to, or first entry into, a life in work. There are no simple remedies for dismantling these most challenging socioeconomic barriers but they must be recognized and in some circumstances may well be tackled on an individual basis. If the foremost barrier to gaining or returning to work is the adverse social context then only dealing with the barriers posed by the health condition and psychological elements to achieve success is a forlorn hope.

Tackling barriers to recovery and gaining more effective access to return to work is a formidable challenge but one that is vitally important to every one of working age, their families, communities, and society as a whole. Despite the current adverse global economic situation, the unimpeded return to work may be achieved but only by a fundamental change in our thinking and practices and by working together to achieve common objectives.

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Part II

Measurement and Methodological Issues: Towards Transdisciplinarity

Integrative Conceptual Framework for Barriers and Facilitators in Return to Work Intervention Planning

8

Jean-Baptiste Fassier

8.1 Health Planning

Health planning is defined as the planning for needed health and/or welfare services and facilities (Medical Subjects Headings n.d.). It usually involves health needs assessment for reviewing the health issues facing a population, leading to priority setting and resource allocation. The development and evaluation of health care programs (interventions) is the subsequent step in order to tackle the prioritized health problem. In the field of work disability prevention, the first return to work programs were developed in Sweden and Canada in the middle of the 1990s for workers with low back pain (Lindström et al. 1992; Loisel et al. 1997; Yassi et al. 1995). Many other interventions have since been developed, focusing on the effectiveness of the interventions with return to work as the main outcome of interest. The development of return to work interventions has created a sufficient body of knowledge; systematic reviews can now conclude that workplace-based interventions are superior to usual care for promoting return to work after low back pain (Schaafsma et al. 2011; Van Oostrom et al. 2009). Similar conclusions are expected for other disabling medical conditions, such as upper limb musculoskeletal disorders and mental health problems for which original studies yield concordant results. Despite the robustness of the evidence on the effectiveness of interventions, little knowledge still exists regarding proper implementation conditions and the sustainability of interventions (Roquelaure 2008).

8.2 Implementation Failures of Return to Work Interventions

Contrasting with the development of effective programs, several failures were described in different countries that have tried to implement return to work interventions or policies (Loisel et al. 2005). For example, in Quebec (Canada), the Sherbrooke model, a gold standard intervention for workers with low back pain (Loisel et al. 1997), failed to be integrated and sustained into routine procedures within the health care system. Resistance to change from the Workers Compensation Boards and low cooperation from the health care professionals (general practitioners, physiotherapists) are potential reasons for this failure (Loisel et al. 2005). In Australia, another experience ended in failure.

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An effective mass media campaign demonstrated an improvement in back pain beliefs with the general population and in back pain management by general practitioners (Buchbinder et al. 2001, 2004, 2005). Despite impressive results, the campaign was not reintroduced due to political considerations that prevailed on medical and public health considerations (Loisel et al. 2005). Another implementation failure occurred in France, where prior to a large-scale implementation, a pilot program for workers with upper limb musculoskeletal disorders was conducted. Results identified difficulties including program complexity and a lack of timely communication to the workplaces and commitment of occupational physicians. Likely, the same factors contributed significantly to the cancellation of the pilot program (Fassier et al. 2012). In general, many reasons can explain implementation failures of return to work interventions. Individually, at level of health care professionals' behaviors, different types of barriers have been described related to the adoption of new evidence and agreement with clinical guidelines. At the organizational level, barriers related to the adoption of innovations within organizations have been named. Not surprisingly, return to work interventions that require both individual and organizational changes face many barriers.

8.3 Return to Work Interventions as a Paradigm Shift

Health care professionals receive their initial training in the disease treatment paradigm, rooted in a biomedical view of disease and treatment. According to this biomedical view, the health care process aims to find the correct etiological diagnosis to prescribe the right etiological treatment to reach complete recovery, as it was before the disease. The disease treatment paradigm has demonstrated its effectiveness for infectious and other acute diseases. However, it presents important limitations when ill health comes to a subacute or chronic stage where psychological, social, and occupational dimensions become part of the disability problem (Loisel et al. 2001) as is typically the case in low back pain (Waddell 1987). In such cases, a shift towards a disability prevention paradigm is recommended (Loisel et al. 2001). Diagnosis is not limited solely to the disease but incorporates a work disability diagnosis (Durand et al. 2002) and a management response that focuses on restoring a functional and social role (versus complete recovery). This paradigm shift implies the acquisition of new professional competencies regarding the diagnosis and management of the psychological, occupational, and social dimensions of the work disability situation. Although physicians cannot be experts in all these domains, they need to develop skills in interdisciplinary (D'Amour et al. 2008) and interorganizational or inter-sector collaboration—the ability to work with stakeholders outside of health care ((Bernier and Burlone 2007; Ogilvie et al. 2009).

The gap between knowledge and practice of health care professionals is highlighted by studies on the adoption of clinical guidelines for low back pain. Original studies report barriers to the adopting clinical practice guidelines for low back pain among different health care professionals (mainly general practitioners and physiotherapists) (Ammendolia et al. 2007; Coté et al. 2009; Dahan et al. 2007, 2008; Espeland and Baerheim 2003). In most cases, the gaps pertain to the overutilization of imaging tests, nonsteroidal, anti-inflammatory drugs and sick leave prescription, and the underutilization of advice to stay active. Barriers identified at the individual level were a lack of knowledge and/or skills (especially in behavioral medicine), a lack of resources (especially time), a purely biomechanical view of low back pain and a focus on the curative aim related to the professional role. Organizational/systemic barriers included a lack of interdisciplinary or inter-sector collaboration, an absence of pathways between primary, secondary, and tertiary care, inadequate management of the psychological aspects of low back pain and side-effects related to fee-for-service reimbursement basis, which favors excessive medicalization. These gaps provide a glimpse into the barriers that a return to work intervention may face before implementation.

8.4 Return to Work Interventions as Complex Innovations

The British Medical Research Council recently revised guidelines for evaluating complex interventions in health service and prepared a list of corresponding features. The latter is composed of a number of interacting components related to the intervention, the number and difficulty of behaviors required by those delivering or receiving the intervention, the number of groups or organizational levels targeted by the intervention, the number and variability of outcomes and the degree of flexibility or tailoring of the intervention permitted (Craig et al. 2008). It is worth mentioning that return to work interventions usually present all these features of complexity given their different components (physical rehabilitation, psychological approaches and workplace adaptations), the number of interactions required among the stakeholders (health care, workplace, and insurance actors), the number of behaviors that are targeted (on the part of the professionals and the workers) and the diversity of outcomes (return to work, functional capacities, coping skills, direct and indirect costs, etc.).

8.4.1 Context Analysis Prior to Implementing Return to Work Interventions

In light of past implementation failures and the complexity of return to work interventions, it is currently recommended to perform a context analysis prior to implementing any complex innovation in a new context (Damschroder et al. 2009; Richard et al. 2003). This preliminary step is intended to identify barriers and facilitators among the adoption system so that an implementation strategy can be proposed to increase the fit between innovation and its context. The urgency of these recommendations contrasts with the absence of practical indications in the literature on the best way to perform such a context analysis (Baker et al. 2010). A first level of difficulty pertains to the different levels at which barriers can occur that is the individual, organizational, and more global level (social, policy, and regulatory level). What is problematic is the vast amount of available theories likely to be used at each level to analyze the causes and mechanisms of barriers and facilitators (Estabrooks et al. 2006; Richard et al. 2007; Shojania et al. 2004; Grol et al. 2003; Grol et al. 2007).

As an example, psychological theories such as the theory of planned behavior (Ajzen 1991) or the stages of change theory (Prochaska et al. 1994) are frequently used to explain barriers at the individual level. Other theories used to analyze barriers at the individual level are educational, motivational, and cognitive theories, among others. Theories used to understand barriers in the local social context are network theories, social learning theories, and theories of leadership, professional development, teamwork, and communication. Analyzing barriers at the organizational level may resort to theories of organizational learning, organizational culture, innovative organizations, integrated care, quality management, and theories of complexity. In the wider political and economic context, usable theories can be reimbursement theories, theories of contracting and political agenda-setting theories. In front of this profusion, the choice of one appropriate theory appears to be problematic especially since there is no theory able to encompass the complete range of barriers at the different levels (Greenhalgh et al. 2004; Shojania et al. 2004). A second level of difficulty of context analysis pertains to the variety of the stakeholders involved in the implementation and functioning of return to work interventions (Franche et al. 2005; Loisel et al. 2005; Pransky et al. 2004). The stakeholders are usually identified within three main systems that is the health care system, the workplace system and the insurance system (Loisel et al. 2001). Frictions and conflicts between the stakeholders have been described for a long time and appear to be inevitable (Franche et al. 2005). However, it is argued that collaborations between the stakeholders are still possible provided their involvement is optimized and their different needs are considered (Franche et al. 2005; Pransky et al. 2004). Eventually, a third level of difficulty for context analysis pertains to the interactions of barriers and facilitators at different levels (individual, organizational, and more global level) and between the categories of stakeholders.

8.5 Integrative Conceptual Framework for Return to Work Intervention Planning

An integrative conceptual framework was developed to facilitate context analysis prior to the implementation of return to work interventions (Fassier et al. 2011) and to summarize barriers and facilitators likely to be encountered. Originally, a literature review was performed to cover three domains of knowledge: diffusion of innovations (Fixsen et al. 2005; Greenhalgh et al. 2004; Rogers 1995), organizational change (Buchanan et al. 2005; Wensing et al. 2006), and adoption of evidence-based guidelines (Cabana et al. 1999; Haines et al. 2004; Saillour-Glenisson and Michel 2003). The resulting framework comprised of eight eclectic categories within the domains of various disciplinary and theoretical perspectives (psychology, sociology, management, etc.) (De Leeuw 2001); these areas are linked with an increased likelihood of a successful knowledge-translation strategy (Estabrooks et al. 2006). The preliminary framework, built upon literature search, was then tested using multiple case studies to examine the feasibility of an evidence-based return to work intervention—the Sherbrooke model (Loisel et al. 1997)—in the French health care system. Following data collection and analysis, some categories from the preliminary framework were modified and others added to ground it in the data. The revised conceptual framework thus became both theoretically and empirically grounded (Fassier et al. 2011). The components of the revised conceptual framework are represented in Fig. 8.1.

Definitions of the eight categories of barriers and facilitators have a theoretical background within literature. *Needs* are defined as “the gap observed by the intended adopter between the reality and a desired state.” The more a situation is perceived as intolerable, the more a potential intervention is likely to be implemented success-

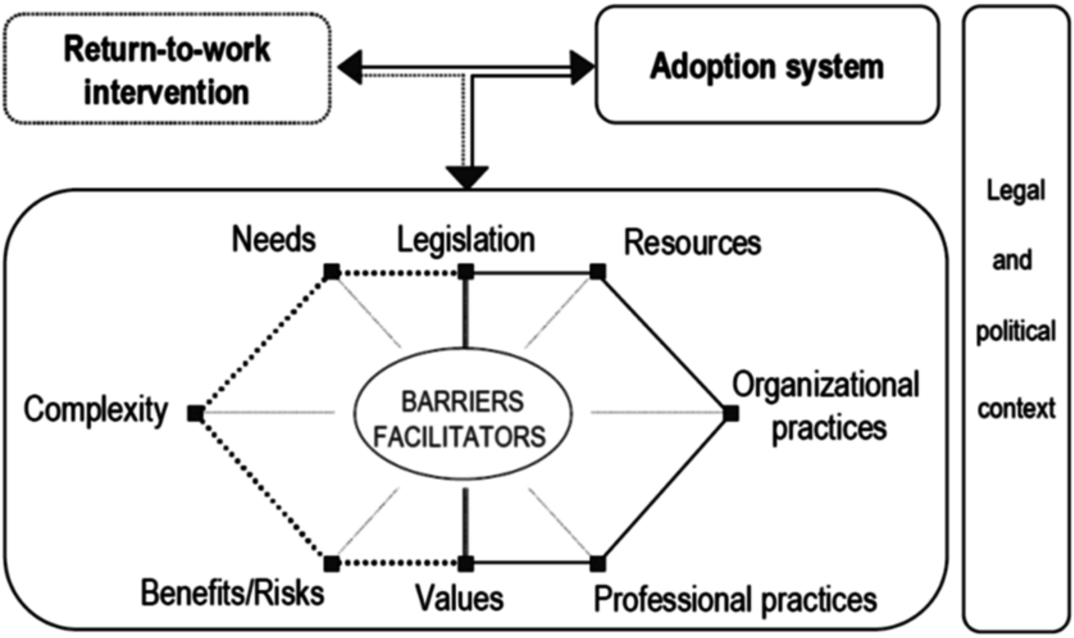

Fig. 8.1 Conceptual framework to identify barriers and facilitators (*Scand J Work Environ Health* 2011; *37*(2): 99–108. doi: 10.5271/sjweh.3138)

fully. *Complexity* is defined as “the extent to which the intervention is perceived by the intended adopters as complex to understand and to use. If an intervention is viewed as simple to understand and use by the adopters, the greater likelihood it will be adopted and implemented. *Benefits* are defined as “the advantages of the intervention as perceived by the intended adopters (cost savings, time savings, gain of legitimacy, etc.)”. If the intervention is viewed to have a clear advantage as perceived by its adopters, the more easily it will be adopted and implemented. *Risks* are defined as “the risks of the intervention as perceived by the intended adopters (additional costs, workload, etc.)”. If the intervention is viewed to have a clearer risk from the perspective of the adopter, the less likely that the intervention will be adopted and implemented. *Values* are defined as “the ideal and cognitive references of the adopters related to the worker’s rehabilitation and his/her RTW issue”. The more the intervention is aligned with the ideal and cognitive references of the adopters, the more easily it will be adopted and implemented. *Professional practices* are defined as “individual professional behaviors of the adopters related to the worker’s rehabilitation and his/her RTW issue”. The more an individual professional behavior is aligned with the components of the intervention, the more easily it will be adopted and implemented. *Organizational practices* are defined as “organizational culture and routines in the adoption system related to the worker’s rehabilitation and his/her RTW issue”. The more the organizational culture and routines are aligned with the components of the intervention, the more easily it will be adopted and implemented. *Resources* are defined as “the provision of resources by the institution to support the implementation of the intervention (financial and human resources, time, social capital, etc.).” The more an intervention is supported by the institutions/authorities, the more easily it will be adopted and implemented. *Legislation* is defined as “the policy, rules and regulations in the adoption system that are related to the worker’s rehabilitation and his/her RTW issue.” The more the policy, rules, and regulations are aligned with the components of the intervention, the more easily it will be adopted and implemented.

The conceptual framework has an eclectic or a “mosaic” nature because the categories of barriers and facilitators arise from different theoretical and/or disciplinary backgrounds (De Leeuw 2001). The eight categories provide an initial picture of the barriers and facilitators that may be encountered when implementing a RTW intervention. Although different kinds and levels of barriers and facilitators may influence each other, no causal links are hypothesized. This conceptual framework is not intended to have an explanatory or predictive value; it should be considered as a description of the feasibility of an RTW intervention in a new context at a given point in time. The next step in the implementation process is the choice of different implementation strategies/activities specifically tailored to the barriers and facilitators identified.

8.5.1 When to Use the Integrative Conceptual Framework

The literature review that built the framework focused on return to work interventions for workers with low back pain. However, categories that stem from the diffusion of innovations and organizational change are likely to apply to a wider range of interventions and should be relevant for other medical disabling conditions such as upper limb musculoskeletal disorders or mental health problems. Stakeholders willing to implement a return to work intervention for another medical condition can refer to the conceptual framework and the original categories and compare them in areas such as medical condition characteristics and management.

8.5.2 How to Use the Integrative Conceptual Framework

The framework is intended to help structure interviews and discussions with stakeholders interested in implementing a return to work intervention, as illustrated in the two case studies presented in the next section. The categories are both useful at the data collection stage and during data analysis as a coding tree for thematic content analysis. Stakeholders approached as key-respondents must fit the characteristics of the planned implementation within the intervention. Key-informants likely to give relevant information on the feasibility of a return to work intervention are those involved in return to work issues on a routine basis from a clinical, workplace or insurance perspective. Further, they must be skilled and forthright in sharing their experiences in regard to barriers and facilitators encountered in the past and anticipate in the future. The sampling of the different stakeholders is critical since it determines the validity of the results (Tong et al. 2007; Ulin et al. 2005). Therefore, importance is placed on considering lay people who are involved daily "in the field" and not only experts or directors whose testimony may be more brilliant and socially desirable in appearance. The geographic area of the context analysis depends on the scale of the planned implementation; it can be local, regional, or national scale implementation. The scale of the implementation also dictates the number and categories of stakeholders' opinions for collection to properly identify barriers and facilitators. The wider the implementation scale, the greater importance of the political and legal dimensions of the implementation (Loisel et al. 2005). Implementation at the regional and national scale should also carefully predict common barriers around project coordination and collaboration between national, regional, and local levels (Bernier and Burlone 2007; Ogilvie et al. 2009). The thematic content analysis of the interviews and discussions with stakeholders proceeds deductively by means of categories in the conceptual framework. However, an inductive process is also recommended so that new barriers and facilitators not included in the framework can be identified (Patton 1999). The expected result is a picture of the context describing the barriers and facilitators likely to be faced among the different categories of stakeholders at various levels (individuals, teams, organizations, legislation). Following context analysis, formulating an evidence-based implementation strategy informed by the results of the feasibility study is recommended (Wensing et al. 2010). Nevertheless, minimal literature exists to elaborate on such implementation strategies in correspondence with the barriers and facilitators disclosed by context analysis. A recent Cochrane review studied the effectiveness of tailored interventions to overcome identified barriers to change (Baker et al. 2010) and pinpointed the absence of indications linking the identified barriers and the interventions intended to address them. This is challenging in view of the multiple implementation interventions available as mentioned in the typology of the Cochrane Effective Practice and Organization of Care Group (Cochrane EPOC Review Group 2008).

8.5.2.1 Case Study 1: A Feasibility Study of a Return to Work Program for Workers with Low Back Pain

Reducing work disability due to low back pain is a public and occupational health priority in France, however, few workplace-based rehabilitation programs exist (Abenhaim et al. 2000; Poiraudeau 2004). Therefore, an international taskforce recommended (Abenhaim et al. 2000) to adapt the "therapeutic return to work" experience (Durand and Loisel 2001) and the Sherbrooke model (Loisel et al. 1997) developed in Quebec, Canada. In order to assess the feasibility of the Sherbrooke model in France, the team used the integrated conceptual framework previously described prior (Fassier et al. 2011). The objectives were to identify and describe these barriers/facilitators at different levels (professional, organizational, and regulatory) within the different systems (health care, workplace, and insurance). Two regions of France were selected based on the rate of musculoskeletal disorders entitled as occupational diseases. A theoretical sampling strategy was applied to identify and reach key-respondents within each region among the stakeholders involved in work disability prevention. Initially, purposive sampling was used to identify key respondents among health care practitioners (general, rehabilitation, and occupational physicians), managers of the regional social security agency (medical, social, and prevention departments) and workplace actors (employers, union representatives). After, a snowball sampling strategy was applied in order to reach a sufficient number of key respondents in each category. All participants attended a three-hour interactive session on the Sherbrooke model, based upon a structured knowledge transfer and exchange model. Data collection was conducted with the key respondents and involved semi-structured interviews ($N=22$) and focus groups ($N=7$). Interviews and discussion guides were based on the integrated conceptual framework. Other sources of evidence were used to confirm the barriers and facilitators reported by the respondents. Observations of professional and organizational behaviors were conducted in the regional rehabilitation centers and grey literature was analyzed to triangulate the findings of the interviews and the focus groups (annual reports and internal regulations of social insurance physicians). Interviews and discussions were recorded and transcribed for subsequent content analysis with qualitative analysis software Atlas.ti version 5.2. Initially, analysis was conducted separately for each region and was subsequently compared in order to identify commonalties and specificities. Barriers/facilitators were reported by the respondents in the interviews and focus groups and then sorted using the categories within the integrated conceptual framework. The categories themselves were identified during the observations or mentioned in the grey literature acted as a “coding-tree.”

Various barriers to the implementation of the Sherbrooke model in France were identified. At legal and political levels, rehabilitation barriers in the workplace during sick leave were identified; professional confidentiality (medical secrecy) was mentioned as a barrier to shared information among the stakeholders involved in the return to work process, both at individual and organizational levels. Barriers at the organizational level were lack of resources (human, financial, technical resources), uncertainties about the Sherbrooke model (perceived risks pertaining to the costs incurred by the intervention; perceived risks of disruption in the workplace organization) and rehabilitation services without occupational objectives. Barriers at the individual level were perceived risks for the workers (feeling of obligation to participate in the intervention), conflicting values of some stakeholders (lack of occupational interest among health care professionals) and professional practices discrepant with clinical guidelines with respect to early mobilization of low back pain workers (excessive prescriptions of bed rest and passive treatments).

Facilitators were also identified at different levels. At legal and political levels, the possibility of graded return to work was identified as a facilitator, as well as the legal possibility of interorganizational collaboration through health care networks. Facilitators at the organizational level were collaborations between rehabilitation centers and workplaces, and commitment to early return to work as part of an organization’s culture. At the individual level, facilitators were the perceived needs for a new solution to work disability, professional values including social or occupational dimensions and professional behaviors in line with clinical guidelines for low back pain. Overall, this integrated conceptual framework drew a picture of the feasibility of the Sherbrooke model in France (Fassier et al. 2009; Fassier et al. 2015). The identification of a wide range of barriers and facilitators was the starting point to the adaptation of an evidence-based work disability intervention in a new context of adoption.

8.5.2.2 Case Study 2: An Implementation Study of a Return to Work Program for Workers with Musculoskeletal Disorders of the Upper Limb

Work related musculoskeletal disorders are the leading cause of occupational disease in France; many of these workers also face job retention issues (Chiron et al. 2008). A multidisciplinary return to work program was developed to ease the “therapeutic return to work” of these disabled workers using ergonomic adjustments to workstations. A process evaluation of this pilot program was conducted to assess its feasibility before a wider scale implementation. The aims of the implementation evaluation were to (a) perform a gap analysis (i.e., were the components of the program implemented according to the theoretical content and expected timeline?) and (b) identify the influence of contextual factors when the program's activities were implemented (Patton 1996). A mixed-methods evaluation was conducted. Quantitative data was collected through management indicators and a survey of the 28 participating occupational physicians. The data collection included semi-structured interviews with patients ($n=4$), members of the multidisciplinary team ($n=3$), focus groups with the steering committee ($n=2$), participant observation of case inclusions ($n=2$), and grey literature about the program.

Categories from the integrated conceptual framework were used to design the questionnaire that surveyed the perceptions and behaviors of the occupational physicians on the intervention. The same categories were used to design the guides for the interviews and focus group discussions, and subsequently to analyze their content. Examples of questions included in the survey are shown in Box 8.1.

Results demonstrated that about half of the expected number of workers were included in the pilot program due to poor referral rates from general practitioners, insurance physicians, and employers. A major barrier identified was the absence of timely communication to advertise the program among the stakeholders. Barriers self-reported by the participating occupational physicians were lack of time, lack of conviction, a program perceived as complex, time-consuming and "hard to sell" to the employers. Those results contrasted with the satisfaction reported by the workers, the timely implementation of the program's activities, and the sense of accomplishment reported by the members of the multidisciplinary team. In this case, utilization of the integrated conceptual framework to identify barriers could explain the implementation failure despite program relevance. Recommendations could be made to the stakeholders to simplify the program, provide incentives to the occupational physicians and conduct a proper communication plan to advertise the program in the community.

Box 8.1 Examples of questions

Knowledge about the program
I think I know the program
I am able to recall the inclusion criteria of the program
I am able to recall the components of the program
I am able to inform the employer and the worker of the aim and modalities of the program
Benefits (advantages) and risks (uncertainties) of the program
I think the program is necessary
I am reluctant or hesitant to use the program
I think the program can help me in my daily practice
I think the program can help the workers to ease their problems
Difficulties in using the program
I think the program is difficult to understand
I think the program is difficult to use
I don't have enough time to get involved in the program
I think that the program is disturbing and time-consuming for the employer
I think that the program is disturbing and time-consuming for the worker

(Answers on a Likert-scale (4 = completely agree; 3 = partially agree; 2 = partially disagree; 1 = completely disagree)

8.6 Conclusion

Return to work interventions must be considered as complex and perceived as potentially disruptive innovations, in health care, in the workplace, and for insurance systems. As such, they are at risk of implementation failure, some of which were described in literature. Performing a context analysis prior to implementing an innovation in a new context is recommended to address this challenge. The integrative conceptual framework presented in this chapter will likely help perform such a context analysis. Further research is necessary on the relevance, effectiveness, and cost-effectiveness of different implementation interventions, alone or in combination. The effectiveness of the implementation strategies should focus on short-, medium-, and long-term outcomes in order to assess their effects on the sustainability of the return to work interventions (Damschroder et al. 2009; Pluye et al. 2004; Tjulin et al. 2010).

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Methodological Issues in Return to Work Intervention Research

9

Bengt Järvholm

9.1 Introduction

An ideal intervention method for return to work (RTW) is simple, easy to apply, and produces excellent results. Such a method does not exist and probably never will. Although numerous studies have been conducted on RTW outcomes—e.g., on October 8, 2012, 167 hits from the Cochrane database (using the search term "return to work"), 225 hits from the Medline database (search term "return to work AND review"), and several review papers were found—the findings were varied a its complexity creates research challenges: there are numerous and rather disparate papers about RTW intervention research, often with long lists of determinants and associated research difficulties. Studies frequently have not met all methodological challenges, which decreases the quality and makes drawing firm conclusions problematic. For example, one review found 100 determinants of duration of disability and RTW after work-related injury and illness (Krause et al. 2001). In contrast, there are also studies recommending solutions and ways to support RTW success (Franche et al. 2005; Pransky et al. 2005; Staal et al. 2005; Sullivan et al. 2005; Young et al. 2005a, b).

Intervention studies often try to change one or several modifiable factors to increase RTW. However, the effect may strongly depend on contextual factors. Since they vary, it is not surprising that RTW intervention studies and reviews end in different conclusions. A good knowledge of influential factors, however, supports understanding of why these conclusions occur. Critiques can easily find factors/determinants that have been insufficiently studied. In one review were physical exercise was evaluated to increase RTW for low back pain, the authors wrote:

> The effectiveness of physical exercise interventions also depends on the influence of contextual factors such as the healthcare setting, the disciplines involved, the role of compensation systems, and the selection of patients (i.e., timing). Because of the fact that these factors vary across healthcare systems and countries, it remains difficult to extrapolate the results of individual studies and systematic reviews to a particular context (Staal et al. 2005 p. 501).

Even if the internal validity of the study is excellent, its value is of very limited importance if the findings cannot be generalized because they were valid at one particular time and place, and a unique set of researchers, patients, employers etc. Thus, randomizing patients, performing blinding, and completing state of the art data analysis will be of little value if the contextual factors are not

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studied sufficiently. This notion does not mean that aspects of internal validity can be disregarded; clearly, no study with poor internal validity will contribute to science. However, compared to clinical studies of pharmaceutical drugs, the challenges in studies of RTW are far more complex.

This chapter focuses mainly on complex RTW scenarios, which typically have many contextual factors, such as work, family and state of the market; this makes each case unique and thus challenging. To address this, some general research principles will be discussed and then a comparison will be drawn with pharmaceutical studies. Aspects of RTW research will follow, aiming to provide researchers with new ideas, research funders a better understanding of the difference between testing pharmaceutical drugs and methods for RTW, and administrative authorities a greater awareness of the inherent difficulties and variability in studying and evaluating interventions to increase RTW.

9.2 Research Paradigms for Intervention Studies and Design Issues

One way to classify designs is to divide the studies into experimental and non-experimental. In medical and social sciences, the latter is often called epidemiology; another division is into qualitative and quantitative studies. Research goals can be further parsed into studies of efficiency and studies of mechanisms. Notably, different research areas have different paradigms of design and analysis. RTW interventions are often performed through biopsychosocial methods indicating that researchers and traditions from social and medical sciences are involved.

Numerous types of measures can be called an "intervention," e.g., providing children with training to read, prescribing drugs for asthma, treating depression with psychotherapy, or providing support to people with financial difficulties. In certain scientific domains, well-established paradigms for research on interventions exist; the strongest paradigm is testing pharmaceutical drugs where both legal and scientific consensus on methodological principles exists. This paradigm has influenced other domains of medical interventions. The pharmaceutical paradigm has also had an influence on social science research, such as the Campbell collaboration (www.campbellorganisation.org).

To understand the similarities and differences between interventions for drugs and RTW, the basic concepts in drug evaluation will be described as a comparison. For any newly developed pharmaceutical drug, evaluation follows a certain chain. Before any study on humans begins, laboratory studies are conducted with cells and chemicals and on animals to evaluate primarily the mechanistic and toxic effects. The first clinical studies are usually safety tests on healthy persons (phase I) followed by a small series on patients to study effects and dose-response relationships (phase II). The selection of patients in phase II may not be randomized. Many drugs fail in these tests; those that pass may be involved in a study of efficiency, comparing this drug to other existing drugs or a placebo (phase III). Here, the studies are typically randomized controlled trials (RCT), often multicenter studies, and have standardized procedures with respect to design, analysis and reporting e.g. the Consolidated Standards of Reporting Trials (CONSORT) guidelines (De Angelis et al. 2004; Schulz et al. 2010). The standardization and guidelines reduce the risk of bias and make meta-analysis possible. Established knowledge for pharmaceutical drugs is usually based on the overall evidence from several studies and a meta-analysis. Bias may occur for different reasons even in RCT; failure to report negative studies may suggest that a drug has better effects than if all studies were reported (Dwan et al. 2008) and poor control of the drug intake may underestimate the drug's effect.

However, even if the adverse effects are studied using the protocols listed above, studies of negative and positive effects can also be investigated in phase IV or postmarked studies. This could involve monitoring patients after the conclusion of phase III or through epidemiological measures. (e.g., examining the negative effects of

Cox-2 non-inflammatory drugs on the cardiovascular system by reviewing the mortality of patients who were prescribed such drugs (Ray et al. 2002)). A reduced risk of cancer was found by following up with patients who had been prescribed aspirin for other reasons, indicating a positive effect (Rothwell et al. 2011).

Pharmaceutical trials are usually large, partly because interest of efficiency in subgroups. For example, a study of a new drug (Losartan), randomized more than 9000 persons and included a subgroup of more than 1000 persons with diabetes (Dahlöf et al. 2002; Lindholm et al. 2002).

9.2.1 The Return to Work Intervention

To successfully implement findings in the future, the intervention must be described clearly and with sufficient detail. However, this is not an easy task—one review of occupational therapy found it difficult to describe what the various therapies consisted of (Désiron et al. 2011). Others reviews of multidisciplinary rehabilitation did not clearly describe what "multidisciplinary" meant (Norlund et al. 2009). A more complex intervention may be challenging to describe, including the details of an interaction between a RTW manager and the patient. One review listed 29 different core competencies of RTW coordinators from 22 different studies (Shaw et al. 2008). The benefits of the coordination are difficult to distinguish from other aspects of the intervention. Further, RTW interventions can be described from different perspectives and involve interactions among several stakeholders (e.g., employer, insurance company, authorities, physicians, etc.) with different concerns and interests (Young, Wasiak et al. 2005). The RTW interventions may want to influence the interests of stakeholders and this intent should be clarified both in the design and the reporting of a study.

The RTW intervention studies and the study of drugs have important differences but also bear some similarities. Mechanistic knowledge from previous studies is sometimes not obvious when randomized RTW trials start. Also, the RTW interventions should be based on some conceptual assumptions that are made explicit, e.g., strengthen a patient's ability to perform additional tasks at work or reduce fear of movement due to pain or, with the employer and the patient, find a workplace accommodation. The idea behind an intervention should be clear and tested in qualitative studies before a randomized study is designed. Many interventions involve one or several persons with specific skills to execute them. The critical details of such skills should be investigated in case studies at early phases. During the early phases, it is possible to explore the potential effects of the intervention method, which is a requisite for power calculations in efficiency studies. If the effect is small compared to other methods, it indicates a need for a larger population to find an effect. Such early phase studies are modestly rewarded and often have difficulty obtaining funding.

9.2.2 Randomization

The purpose of randomization is to ensure that those with the best prognosis are not selected into the intervention group and, conversely, those with the poorest prognosis into the control group. Randomization is theoretically attractive, easy to understand and communicate, and should be applied whenever possible. Difficulties exist though: randomization is a random procedure and risk exists that those with the best or worst prognosis may be overrepresented in the intervention group by chance. This is less probable if the randomization is done with a very large group (i.e., thousands of persons). Comparing critical factors in the intervention and control groups is important also in randomized studies. For example, in studies of antihypertensive drugs, blood pressure are compared in the intervention and control groups at start of the intervention. Studies of RTW must follow the same approach, but it is unclear on what to check and compare. Typically, age, sex and some other characteristics of the patient are reported. However, many research reviews have emphasized the importance of workplace factors for RTW, but these determinants are often under-studied and subsequently rarely measured and reported. Importantly, subgroups may exist with much worse prognosis and if they are unevenly distributed between the control and intervention group, the results may be biased as the following example shows.

There is a minority (around 10 %) of those on sick leave due to lumbar back pain who do not RTW after 6 months (Andersson 1999). If researchers plan a RTW study of 200 randomized patients, about 20 patients will have a poor prognosis (sick leave of more than 6 months) among the 200. If they randomize the 200 into a treatment group of 100 and a control group of 100, the 20 with poor prognosis could be unevenly distributed between the groups. The risk of getting 14 or greater of those with poor prognosis in one group and 6 or less in the other is not negligible even if a perfect randomization is conducted—the probability of such an uneven distribution is around 10 %. Thus, if a group of 200 patients with low back pain and with 6 weeks of sick leave is randomized, the probability of an uneven distribution of severe cases in the intervention and control groups is not neglibile.

The risk of uneven distribution between the intervention and control group decreases with the size of the studied population. Ensuring access to a large number of study participants is important when reviewing important determinants of RTW and comparing the occurrence of high-risk cases between groups. If researchers are unfamiliar with the determinants, they can increase the randomized group size and vice versa. For RTW studies, the predictors are not always well known; this suggests randomization in large groups for a reliable result. In a systematic review of community and workplace-based studies to manage sickness absence, 34 RCT studies were identified (Palmer et al. 2012). Although 12 of these RTW studies focused on low back pain, only four involved about 200 persons or more. Thus, to gain the benefits of the randomized trial, a RTW study should include a large group (several hundred patients or preferable thousands) or control for critical factors. As the latter rarely is possible or feasible, randomized RTW studies should be very large or at minimally designed to allow for a meta-analysis.

9.2.3 Contextual Factors

A contextual factor is a research variable of non-primary interest that may influence the outcome and external validity of research. In principle, an indefinite number of contextual factors in RTW intervention research exists. Selecting factors to control and describe in the intervention is a difficult but important step in the design, analysis and reporting. However, contextual factors may unwittingly change. For example, the organization that provides services to employees on sick leave may undergo an organizational change during the course of the study, altering the outcomes of the RTW intervention in an unknown way. Contextual factors may or may not be under control in the research. Typically, researchers are not in control of macro-system factors, such as laws, attention in media, insurance policies and practices. Such contextual factors need to be described in the research report and considered in data interpretation; they may be of great significance and ruin a study, especially in terms of efficiency. For examples, the rules for sick leave and disability pension benefits changed in Sweden in 2008. Between 2008 and 2010, the number disability pensions decreased from 8.6 to 2.8 per 1000 women and year; this made RTW interventions studies very difficult to interpret and analyze during that transitional time period. Some factors can be partly controlled by the design, such as not conducting studies in organizations during periods of rapid change.

A study's importance is strongly dependent on its external validity, which is strongly dependent on contextual factors. Thus, handling contextual factors is a significant challenge for researchers. Notably, contextual factors include diverse areas like work environment, law, social contexts and individual elements, making cross-disciplinary research essential.

9.2.4 The Outcome

An essential element of any RTW study is the measurement of outcome. It can be defined as the number of sick leave days, persons that return to work, and recurrent sick leave periods/days and cost-benefit analysis. Additional, more subjective outcomes may exist, including self-report measurements of patients' well-being, functioning, coping or pain.

Absence days can be measured during a short or a long period. The return to work may be followed by repeated periods of absence. A study of upper extremity disorders found approximately a 30 % increase in the number of absent days if all incidences were calculated. Also, the number of lost days increased from 116 to 456 days if the calculations were completed at 6 months and 5 years respectively (Baldwin and Butler 2006). These findings reveal that: (1) the number of absent days is typically non-normally distributed (i.e., a few individuals with very long sick leaves), thus the number of days depends on the follow-up time, and (2) if the goal of intervention is to increase RTW in long-term disability cases, the outcome of RTW interventions has to be evaluated after several years.

The intervention's duration may also increase the RTW duration, for example, when sick listed patients wait for an intervention to start. This issue could explain why an intervention for common mental disorders increased rather than decreased the RTW time (Noordik et al. 2012).

Long-term absence and disability pension are costly for insurers and society and important outcomes to measure. However, patients with long-term disability constitute a rather small fraction of all patients with absence, especially in groups with early RTW interventions. Most studies have low power to determine the efficiency of a long-term sick leave or disability with good precision. A solution is to use multicenter studies.

The outcome of interest may differ between stakeholders (Young, Wasiak et al. 2005). Whereas repeated short-term absences may be the most costly for the employer, for insurers' and societies', their costs depend on long-term absence and even minor improvements could be cost-effective (Squires et al. 2012).

9.2.5 Analyses

The outcome of RCT studies relies on the administration of the intervention. By comparison, in drug trials, it is essential to ensure that the patient took the pill. Simple interventions such as exercising to increase physical fitness can be measured, for example, by measuring the increase of physical work capacity during training. However, RTW interventions mostly include several aspects and several actors. Studying how well the intervention was performed is far from trivial. It can be evaluated through questionnaires or interviews, also known as a process evaluation. A process evaluation can contribute to understanding the workings of an intervention, but it requires an identified theoretical framework (Kristensen 2005).

However, idiosyncratic factors, such as researchers' diligence in reporting mistakes, error types, inadequate engagement or low enthusiasm among interveners, are difficult to evaluate. Significant risk exists that the answers will be biased according to the desired outcome.

The RTW interventions may be performed at an organizational level; evaluation of such interventions requires its own methodology, usually relying on methods adopted from the social sciences (Nielsen et al. 2010). Interventions directed towards single individuals may also include organizational aspects.

Every patient evaluated for a RTW is unique, especially considering the combination of contextual (e.g., workplace or social situation) and individual factors. Various theoretical approaches may help understand why a certain method for RTW worked. Theoretical underpinnings of RTW interventions should be clearly discussed in research papers. If an intervention involves an employer, it requires a theory explaining its significance and a clear rationale.

Notably, research studies often utilize study coordinators who can engage in multiple activities that involve the employer and other stakeholders. The purpose of these activities is not always clearly explained in studies (Shaw et al. 2008).

9.2.6 Adverse Effects

A common saying with pharmaceutical drugs is that if they have an effect, they also have an adverse effect. The same is probably true of RTW interventions, but studying adverse effects seems of lower priority and is sometimes excluded in evaluations. Theoretically, it is easy to understand why a RTW intervention may have adverse effects if it, for example:

- Causes harm to the patient by forcing him back to a harmful environment. Musculoskeletal disorders (MSD) are common objects for RTW interventions. Even if a work-related factor(s) is excluded from causing a MSD disorder, it is not the same as saying that the factor is not harmful for a vulnerable patient. Thus, considering the risk for a vulnerable patient is required.
- Generates significant costs for the employer e.g., decreased productivity or costs for adaptations that would not be used if the RTW intervention fails.
- The well-being or quality of life for the patient may be impaired by RTW. Studies showed that persons have fewer symptoms such as anxiousness and tiredness if they retire (Westerlund et al. 2009, 2010). Such findings indicate that minor mental problems like fatigue may be the price we pay when we work. Most workers can tolerate such symptoms and gain from other positive factors from work, such as a better economic outcomes. However, there may be patients for whom those negative factors are overwhelming and lead to a considerably lower quality of life.

9.2.7 Reporting

A standard for reporting non-pharmaceutical randomized trials exists similarly to the standards for pharmaceuticals (Boutron et al. 2008). This standard helps study design—key reporting issues must be part of the design and data collection. Both negative and positive findings should be reported or the literature based on research may become biased. For example, if more positive studies are reported, a RTW intervention may look more effective than it really is (Palmer et al. 2012). Smaller negative RTW studies may be difficult to publish as journals may consider them as contributing little to science. Thus, the lack of reporting can be biased by the publication policies of scientific journals. If an RCT, a registration prior starting is recommended with the International Standard Randomized Controlled Trial Number register (ISRCTN; http://www.controlled-trials.com).

9.3 Workplace Issues

A significant amount of literature has been written about patients and RTW, including prognostic factors, risk factors, diagnoses, motivation, social status, and other clinical and psychosocial factors. Far less has been written about the employer/workplace and RTW; for example, subdividing companies according to motivation and implementing accommodations to improve RTW. Studies compare patients according to risk factors without adjusting for complex workplace factors—simple factors such as manual or office work may be considered, however. This practice may cause bias in intervention studies and also in understanding RTW. Intervention methods for RTW rarely have strategies that vary according to workplaces, e.g., if the employer obviously not wants the worker back.

Reviews of workplace-based interventions indicated a need for more high quality studies (Franche et al. 2005; Palmer et al. 2012). Franche et al. was “struck by the limited details provided about the interventions offered” (p. 627). Palmer et al. (2012) observed a publication bias and that the future research should focus on simple low-cost interventions.

The workplace includes several stakeholders that may be important for a successful RTW intervention, including the employer, labor representatives and health care providers within the context of occupational health service (Franche et al. 2005). The “employer” may consist of several persons, such as foremen, middle management or representatives of the personnel department, further increasing the complexity. Characterizing the workplace dimensions and including it in analysis and design would be a step forward.

RTW can be evaluated from the standpoint of worker productivity. This measurement is not an obvious point of focus for clinicians and is uncommon in the rehabilitation of patients—it is usually taught in economics and engineering courses. Productivity in economic terms is a comparison between input and output, but it can be complex to estimate (Zhang et al. 2011). On assembly lines, measuring the time for certain tasks through Measure Time Measurement (MTM) has occurred when manual handling was common. However, as production has been more automated, such methods are less valuable as the operators’ tasks are often supervision, repairs and maintenance. Productivity for a single person in the service sector, for example, shop assistant, office work or hospital work, is often based on soft data from supervisors and colleagues; in call centers, the production of single workers are routinely investigated. There are questionnaires for measuring the productivity of patients, which are answered by the patient, for example, Health and Labor Questionnaire and the Quantity and Quality instrument (Brouwer et al. 1999; Van Roijen et al. 1996). The correlation between self-reported and observer-estimated productivity among floor layers was investigated in a small study and was found to be modest ($N=19$, $r=0.48$) (Meerding et al. 2005).

Productivity is also linked to a certain job and workplace and are difficult to test in laboratories or artificial work environments. However, methods to measure or estimate the productivity are needed, especially in discussions with the employer.

A lower productivity may persist some period after he/she has returned to work. A Dutch study found that 60 % of workers who had 2–6 weeks sick leave for musculoskeletal disorders reported reduced productivity when they returned to work. The decreased productivity was longstanding and after 12 months, 40 % continued to report decreases (Lötters et al. 2005).

The measurement of productivity in RTW research is further complicated by presenteeism, i.e., persons with disorders that are at the workplace but are less productive. A study of persons at work with incipient upper extremity symptoms found that 56 % reported productivity losses of on average 34 % (Martimo et al. 2009). Consequently, patients may have reduced productivity prior to starting sick leave; thus, it may not be sufficient to compare the productivity of the patient before and after sick leave in studies of RTW. Instead, compare the productivity after RTW with an average productivity as estimated by the employer. Instruments that measure productivity by relying on the patient’s self-report may be insufficient; there is a need for instruments that measure the employer’s opinion of productivity at RTW.

9.4 Concluding Remarks

RTW research is challenging, especially considering the varying and complex contexts. Comparing this research with a RCT of pharmaceutical drugs may help to understand similarities and differences. As studies indicate that the work/workplace is important in RTW (e.g., Anema et al. 2009), research in RTW can also use intervention methodologies from occupational settings (Kristensen 2005). The complexity of contexts indicates that scientists from different fields should be able to contribute to the recognition and measurement of diverse dimensions of these contexts, including contextual changes over time. To have enough statistical power, multicenter approaches seem necessary. Thus, while multimodal rehabilitation seems to be a popular aspect of RTW research, a “multi-scientific” and “multicenter” approach could improve the research.

The theoretical underpinnings of an intervention should be clearly stated and be included in the design and evaluation.

The progress of RTW interventions would mean that we have empirically tested theories that guide us in practice. Each patient is complex and has a unique combination of contextual factors. The primary step would be to better describe and outline the theory behind the intervention, its critical moments and the required skills. Thus, going back to small qualitative studies where the processes and theories are developed rather than starting randomized trials of modest size is needed. Some existing theories could be studied in RCTs but need large resources. A recent Danish study included about 10,000 patients and had a total cost greater than €36 million (Aust et al. 2012). Meta-analyses of several smaller studies are hampered by the need to adjust for contextual factors, which is difficult as they are not reported/measured or measured in different ways.

Today, the outcome of medical care is compared between hospitals; RTW could also be compared between clinics even if such comparisons have difficulties. Finding differences would start a discussion and encourage further studies to understand these differences. This, in turn, may generate new concepts and theories, which could be studied through multicenter designs.

This chapter has focused on interventions on patients provided by the medical and social sectors. Some RTW interventions are provided by national initiatives, such as improving the benefits for those who RTW, or employers who facilitate workers to RTW. Other interventions impair the benefits for those that do not RTW, e.g., by decreasing social benefits or limiting the time for sick absence. The evaluation of the effectiveness of such measures is even more complex and can be rarely done by RCTs and includes political and moral aspects and welfare policies provided by the state (Clayton et al. 2011, 2012).

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Program Evaluation in Return to Work: An Integrative Framework

10

François Champagne and Michèle Rivard

10.1 Introduction

The field of evaluation has grown tremendously over the past 50 years—it is now populated with various tribes using distinct languages, differing disciplinary focuses and, more importantly, different and often divergent epistemological assumptions, methodological requirements and professional positions. Thus, a wide variety of perspectives exist on what evaluation is and on how it should be done.

In this chapter, we first address a fundamental issue, that is, the definition of evaluation. We then propose a general integrative framework to guide the evaluation of any *intervention*. We then suggest some questions and issues to be considered when selecting particular evaluation procedures in a particular context. We finally discuss a real-world example of an evaluation in the field of return to work. We use this example first to show how the framework or some of its characteristics were used and also to highlight some challenges encountered at the planning stage as well as throughout the evaluative process.

10.2 What Does *Evaluation* Refer To?

Evaluation is a common human action or social process that can take place at several levels of cognition, from intuition through opinion, to assessment to systematic analysis. According to *Merriam-Webster*'s dictionary, to *evaluate* is to "determine the significance, worth, or condition of (some object, an "*evaluand*") usually by careful appraisal and study" (Merriam-Webster Online Dictionary 2012). In the scientific and professional domains, there is no unique universally accepted definition of evaluation. Leading authors have offered various definitions. The evolution of definitions can serve to illustrate how the conceptualization of evaluation has evolved over time.

For Suchman (1967), evaluation is "the determination (whether based on opinions, records, subjective or objective data) of the results attained by some activity designed to accomplish some valued goal or objective" (p. 31–32), This classical view of evaluation allows for a variety of methods to be used but is driven mainly by the consideration of one evaluation criteria, goal attainment.

For Arnold (1971), evaluation is "the systematic planned feedback of information needed for guiding future actions" (p. 263). This definition stresses the almost symbiotic relationship

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between evaluation and decision/action, an idea that later became a central issue and concern in evaluation (and later in research in general).

Carol Weiss (1972) played a central role in expanding the conceptualization of evaluation which she defines as "the systematic assessment of the operations and/or the outcomes of a program or policy, compared to explicit or implicit standards, in order to help improve the program or policy" (p. 4).

Beeby (1977) referred to evaluation as "the systematic collection and interpretation of evidence, leading, as part of the process, to a judgment of value with a view to action" (p. 69). This definition introduces the idea that the worth of what is being evaluated stems from the attribution of a judgment of value.

The Canadian Evaluation Society (CES), founded in 1985, defines evaluation as "the examination of purposeful action with respect to rationale, implementation and outcome." The formal consideration by the CES of implementation and rationale or *raison d'être* of the action as criteria for evaluation is noteworthy.

Scriven (1991) suggested that evaluation is "the process of determining the merit, worth or value of things" (p. 139). For this author, the number of possible criteria is as large as the number of evaluation users as merit, worth and value lie in the eye of the beholder. This approach is known as *goal-free evaluation* as opposed to goal-based evaluation approaches, which have dominated the evaluation field throughout its history.

Among contemporary definitions of evaluation, three are worthy of mention here, for different reasons. Patton's definition (2008) is comprehensive, both in its consideration of possible criteria and uses: "program evaluation is the systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments about the program, improve program effectiveness, and/or inform decisions about future programming" (p. 39).

According to Mark et al. (2000):

> Evaluation assists sense making about policies and programs through the conduct of systematic inquiry that describes and explains the policies' and programs' operations, effects, justifications, and social implications. The ultimate goal of evaluation is social betterment, to which evaluation can contribute by assisting democratic institutions to better select, oversee, improve, and make sense of social programs and policies (p. 3).

This definition is similarly broad and emphasizes the usefulness of evaluation as a democratic tool in a social system.

Finally, for Rossi et al. (2004):

> Program evaluation is the use of social research methods to systematically investigate the effectiveness of social intervention programs. It draws on the techniques and concepts of social science disciplines and is intended to be useful for improving programs and informing social action aimed at ameliorating social problems (p. 16).

This definition, in the seventh edition of one of the best-selling and popular textbooks in evaluation courses, is somewhat baffling: it is appropriately broad in its consideration of evaluation's potential uses, but strangely narrow in the criterion it puts forward: effectiveness. This probably reflects the fact that despite enormous progress in the conceptualization and practice of evaluation, both as a scientific and a professional endeavor, the *goal-attainment* view of evaluation remains highly prevalent.

The above definitions clearly vary in terms of perspective and breadth but also share key definitional elements. Evaluation involves *systematic inquiry* that is planned and reasoned. It requires *empirical observation and interpretation.* It necessarily incorporates the elaboration of a *value judgment* which can be made on the basis of many alternative criteria. Also, evaluation is intrinsically rooted in a *context of decision-making or action.* From these observations and propositions, Champagne and colleagues (Champagne et al. 2009) offer the following broad and encompassing definition of evaluation: "evaluation consists of making a value judgment on the worth of an intervention or of one of its components by implementing a methodological apparatus aimed at providing and interpreting scientifically valid and socially legitimate data so that the different stakeholders, which may have different values and interests, be able to take a stand and construct a judgment which may lead to action" (p. 52).

Here the term *intervention* refers to any type of purposeful activity, action or organizational entity one wishes to evaluate (the evaluand). An intervention can correspond to a device, a technique, a practice, a protocol, a program, a policy, a law, a reform, an organization, a network, etc. It can thus be at a micro (a pill, a technique, a practice, etc.) meso (program, organization, etc.) or macro (a law, a policy, a reform, etc.) level.

An intervention can be simple when a limited number of strategies are intended to accomplish a small number of (largely consensual) objectives (a pill, a policy). It is complicated when involving simultaneously several simple interventions (for example in a program). It can be complex (e.g., a health system) when multiple, possibly divergent goals are pursued through fuzzy means (poorly understood means-ends chains); when there may exist different pathways leading to the ultimate goals; when the intervention or system of action is hardly distinguishable and highly dependent from its environment. Also, one must note that evaluation can focus either on the whole intervention or on some of its components.

Evaluation is always *political* in the sense that even though it will seek to mobilize the most rigorous tools and processes appropriate in a given evaluative context so as to optimize the validity of results, both the evaluation process and the evaluation results can be used in a political decision game involving various stakeholders whose interests may vary from delaying a decision to supporting a given position. The higher number of stakeholders and stakes, the higher the political pressures needing management throughout the evaluation process.

10.3 An Evaluation Menu

Epidemiologists do it. Psychologists do it. Educators do it. Economists do it. Management consultants do it… They all do evaluation but refer to what they do in completely different terms. Michael Quinn Patton (1986) identified 132 types of evaluation in the literature, thus showing a clear lack of uniformity in terminology. To facilitate reconciliation of various disciplinary approaches to evaluation, we developed an integrative and comprehensive evaluation framework (Champagne et al. 1986, 2009). This framework is based on a general theory of intervention. It is comprehensive because it is derived from a consideration of the nature of interventions, and more specifically from the consideration of all of the elements composing the intervention and of all of the possible relationships among these elements. From these complex factors and interactions stems the overall evaluation menu.

An intervention can be conceived as an organized action system whose goal is, within a particular environment and for a given period of time, to modify the predictable path of a phenomenon in order to solve a problem situation. An organized action system (Fig. 10.1) has five components: a *structure*, *actors and their practices*, *action processes*, *ultimate goals*, and an *environment* (Bourdieu and Wacquant 1992; Parsons 1977; Rocher 1972).

Structure consists of three interdependent dimensions. First, a physical dimension, which refers to the volume and structuring of the different resources mobilized (financial, human, material, technical, or informational). Second, an organizational dimension, which corresponds to the set of laws, by-laws, conventions, and management rules which govern the distribution and exchange of resources; these are the *rules of action* of the action system. Finally, a symbolic dimension; this includes beliefs and values which allow different actors involved in the intervention (the stakeholders) to communicate among themselves and to give meaning to their actions.

Actors of the intervention are characterized by their projects, their conception of the world, the resources they have or control and their willingness to act. They interact in an ongoing game alternating from cooperation to competition as they try to increase their control over the most critical features of the action system (money, power, influence and commitment to social norms). The actors' practices or conducts are a key constituent of the intervention; they are influenced by the structure of the intervention and they are interdependent.

An *action process* comprises all processes during which and through which the resources are mobilized and used by the actors to produce the goods and services required to attain the ultimate goals of the intervention.

The *ultimate goals* refer to the purpose of the intervention in terms of the situation expected to be observed as a result of the intervention. As

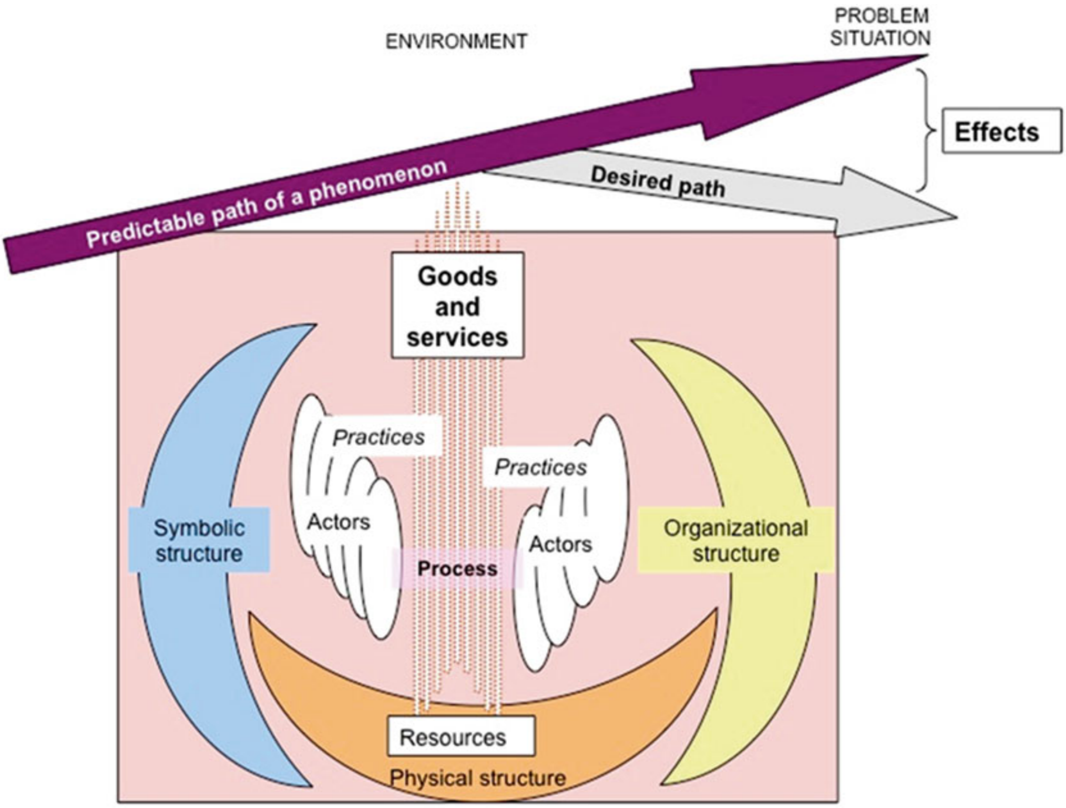

Fig. 10.1 Intervention as an organized action system (Champagne et al. 2009). Reprinted by permission of the publisher

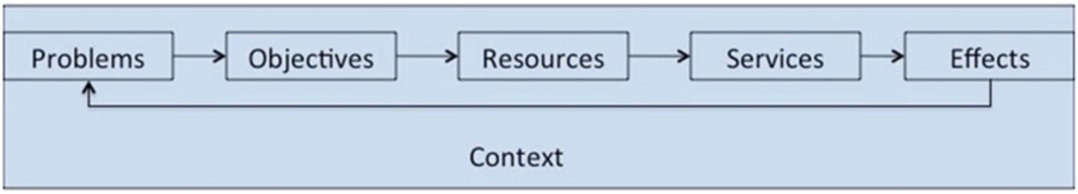

Fig. 10.2 A linear sequential representation of the elements of an intervention

illustrated in Fig. 10.1, the ultimate goal of the intervention is the modification of predictable path of the phenomenon targeted by the intervention for a desired path. In turn, the *problem situation* should evolve towards a *resolved situation*. The action process will result in a series of intermediate outcomes before reaching the ultimate goal.

The *environment* of the intervention refers to all aspects of the context in which the intervention is implemented, namely the physical, legal, symbolic, historical, political, economic and social context. It also incorporates other organized action systems interacting with the intervention.

For analytical and decomposition purposes, the components of an intervention (or action system) can be represented sequentially in a linear fashion (Fig. 10.2): An intervention stems from the observation of some problems whose modification become an objective; to attain this objective, the intervention then proposes, in a particular context at a given time, the mobilization of a particular set of resources in particular action processes producing specific goods or services eventually leading to the effects, such as the attainment of the objectives through some more or less complicated outcome chain.

These intervention elements and the causal structure linking them constitute a generic intervention theory often referred to in the evaluation literature as an intervention logic model (more on this model later). They also correspond to the elements of a system in systems science as the terms resources, action process, services and effects can be replaced by the terms input, process, output and outcome.

This generic intervention theory or model can be used to derive a comprehensive set of evaluative criteria. How can an intervention depicted as in Fig. 10.2 be evaluated? Interventions are composed of elements and of relationships among them. One can thus evaluate either through an assessment of elements or an analysis of interrelations among those elements. Evaluation consists in formulating a judgment on the worth. Where will the judgment arise from?

10.3.1 Normative Assessment of Components

When looking at various elements of the intervention, judgment results from the comparison of the situation (what is observed) with some standard (what is expected). This type of evaluation can be referred to as *normative evaluation*: assessing the worth of an intervention by comparing resources, services and outcomes to appropriate standards. One can thus refer to three types of *normative* evaluation: ***assessment of structure***, ***assessment of process*** and ***assessment of outcomes*** (Fig. 10.3).

When *looking* at structure, process and outcomes, five specific evaluation questions, corresponding to five distinct criteria, can guide the assessment:

- *Is the intervention implemented according to plan*? (*fidelity*)
- *Is the targeted population reached*? (*coverage*)
- *Are the activities appropriate and competently executed*? (*quality*)
- *Are costs according to plan*? (*cost*)
- *Are expected outcomes achieved*? (*goal attainment*)

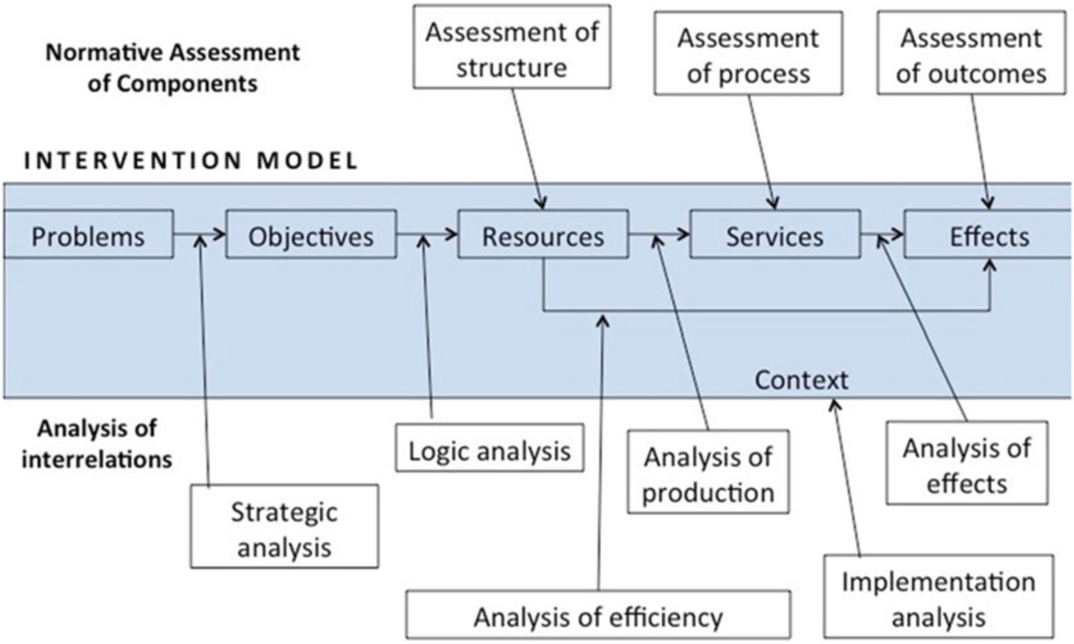

Fig. 10.3 Intervention model and types of evaluation

Table 10.1 Targets and criteria in normative evaluation

	Targets		
Criteria	Structure	Process	Outcome
Fidelity	X	X	
Coverage		X	
Quality	Proxy	X	Proxy
Cost	X	X	
Goal attainment			X

As illustrated in Table 10.1, *Assessment of structure* can address the fidelity and costs of the intervention. *Assessment of process* can cover issues of fidelity, coverage, quality and costs; *Assessment of outcomes* determines the extent to which the intervention was successful in attaining its objectives.

These evaluation criteria are quite straightforward, with the exception of the quality criterion, which is certainly a quite elusive, often misunderstood concept. We define quality as "a set of attributes of the care (service) process, which should bring about the most favorable outcomes given current scientific knowledge, available technology and social norms and expectations. Quality is thus defined as the conformity of the care process to professional, consumer and social standards regarding different dimensions of the process" (Champagne et al. 2009). These dimensions of the process can be technical, organizational or interpersonal (Donabedian 1980). Technical quality refers to doing the right thing (appropriateness) the right way (competent execution) (Brook and Kosecoff 1988). Organizational quality refers to accessibility, continuity and comprehensiveness of care and services. Interpersonal quality refers to art of care (respect, courtesy, communication, support).

The term *criteria* refers to the bases of the evaluative judgment. It can be expressed as questions, measurable characteristics and at the more operational level as indicators. *Standards* refer to specific scores on those indicators that will serve to distinguish between what is sought (a score that can be considered excellent, good, or acceptable depending on the context) and what is not. There are multiple possible sources for the selection of standards to be used in normative assessments. *What was planned* constitutes the most common and essential standard, especially for the criteria of fidelity, coverage, cost and goal attainment. For the quality criterion and its various subcomponents, standards are derived most often from the literature, from observation of leading practices (benchmarking) or from expert and user opinions. User opinions refer to what is often called *satisfaction*. It is best referred to as users' perceptions of quality or outcomes and viewed as a source of standard for the quality and outcome criteria rather than as a criterion in itself.

10.3.2 Analysis of Interrelations

Evaluative judgment can also stem from the consideration of relationships among the elements constituting the intervention. In this case, judgment is constructed on the basis of the fit among the elements: "is this y appropriate given this x?" As illustrated in Fig. 10.3, there are six possible interrelations that can be analyzed in an evaluation. Six types of evaluation, calling for different methods, can thus be performed: ***strategic analysis***, ***logic analysis***, ***analysis of production***, ***analysis of effects***, ***analysis of efficiency***, ***and implementation analysis***.

Strategic analysis seeks to question the intervention's raison d'être, that is, the fit between the explicit objectives of the intervention and the problem situation targeted by the intervention (Rossi et al. 2004). This type of analysis addresses the question: *Is the intervention justified in relation to the main problems in the population* (*criterion of relevance*)?

Strategic analysis is concerned with analyzing different facets of the relevance of the intervention. More specifically, judgment on the intervention's relevance can be made by analyzing the following:

1. The fit between the targeted problem(s) and the situation, i.e., the relevance of the targeted problem: judging whether a particular problem (or set of problems) is a priority on the basis of its relative importance and the capacity for acting upon it;

2. The fit between the targeted causes of the problem and the entire set of its causes, i.e., the relevance of the targeted causes: judging whether a particular cause (or set of causes) is a priority on the basis of its relative importance and the capacity to act upon it; and
3. The fit between the intervention's maître d'oeuvre (project manager) and maître d'ouvrage (contracting authority) and the causes to be addressed, i.e., the relevance of the intervention consortium: judging whether a particular consortium of intervention leaders is appropriate given what the intervention is intended to act upon.

Methods to be used in strategic evaluation are similar to methods one would use in strategic planning, including needs assessment and priority setting methods. The distinction is that these methods would be used here ex post rather than ex ante: to elaborate a judgment on a given intervention's relevance rather than for elaborating (planning) a relevant intervention.

Logic analysis is concerned with the fit between the intervention's objectives and the means proposed to achieve them. The main question is: *Does the intervention propose plausible means of meeting the intended goals* (*criterion of plausibility*)?

Plausibility is assessed by analyzing both the theoretical hypotheses and the operational hypotheses underlying the intervention. The theoretical plausibility of the intervention refers to the plausibility of the causal pathway specified in the logic model: is it plausible that a particular set of outputs could lead to the desired effects through a given causal chain, that is a series of intervention hypotheses? The operational plausibility of the intervention refers to the plausibility of the expected links among resources, services and outputs: is it plausible that a given set of resources will be appropriate to produce expected services and that these services will produce expected outputs? A high level of operational validity is plausible if the resources and activities are comprehensive and appropriate in relation to the intended objectives of the intervention.

Logic analysis refers to expected relationships (hypotheses), not actual ones. Judgment will thus be made by confronting what the intervention proposes with scientific and practical knowledge about what can work. One can also compare alternatives in order to rule on whether the intervention, as designed, is the best option. Methods to conduct a logic analysis include critical reviews and syntheses of research, expert judgments, decision analysis and empirical validation methods.

Analysis of production studies the links between resources used and activities (services) produced. Two aspects of activities can be considered: productivity and quality. The central question is: *Are the resources used so as to maximize the quality and value of outputs produced* (*criterion of technical efficiency or productivity*)? Sub-questions are as follows: Is it possible to produce, with the same resources, more services or higher quality services? Is it possible to maintain, with less resources, the same level of services (quantity and quality)?

Analysis of effects measures the effectiveness of the intervention, that is, the impact of the activities (services) on one or multiple outcomes. It addresses the question: *What are the effects attributable to the intervention* (*criterion of effectiveness*)?

Two issues are of particular concern here and serve to distinguish between analysis of effects and normative assessment of goal attainment: comprehensiveness of the measurement of effects and concern with causality. First, evaluators need to make sure to consider indicators related to all possible effects of an intervention and not limit measurement to goal attainment indicators. Indeed, effects go far beyond what was strictly intended to include undesired effects, unanticipated effects, short-term, medium-term, and long-term effects, and externalities (effects on other populations). Second, evaluators need to use the appropriate methodological apparatus to make sure that observed effects were indeed caused by the intervention so as to obtain valid conclusions on the effectiveness of the intervention.

There are different types of effectiveness reflecting the degree of control of the intervention, or more precisely of the conditions surrounding the delivery and evaluation of the intervention. *Theoretical effectiveness* can be studied with experimental research designs where the researcher can apply the highest level of control of the experimental conditions (e.g., effectiveness of a chemical substance in a laboratory setting). *Trial effectiveness* examines the intervention in an environment that is controlled but closer to natural conditions (e.g., randomized trial of a program); here the researcher still has an important level of control over the intervention by deciding what is delivered, how and to whom. *User effectiveness* studies the intervention as it is delivered in a natural setting (e.g., quasi-experimental cohort study comparing cohorts of workers either exposed or not exposed to a program). Finally, *population effectiveness* seeks to determine the impact of a generalized application of the intervention in the targeted population (e.g., impact of a population-wide vaccination campaign). Appropriate research methods are conditioned in part by the type of effectiveness one wishes to study.

Analysis of efficiency refers to the relationship between resources and effects. Inputs (costs) are related to outcomes (consequences) in order to answer the following question: *At what costs are the effects produced* (*criterion of global efficiency*)?

This is the domain of economic evaluation. There are different types of economic evaluations involving a comparison of costs and consequences between at least two alternatives (e.g., new intervention versus usual intervention). The most common types are cost-effectiveness analysis, cost-utility analysis, and cost-benefit analysis. They are characterized by conceptual and methodological differences for the assessment of the "consequence" component of cost-consequence analysis.

Implementation analysis concerns the interrelations among intervention, context, and effects. In general, it addresses the question: *How do contextual determinants influence implementation and effects*? The objective of this type of analysis is to understand the causes and effects of variations in implementation. This issue has been referred to as *opening the black box*. Implementation analysis provides useful information on how and why an intervention works or does not work. Analysis of effects focuses on the value of the intervention in a given context. It is concerned primarily with internal validity and can have limited external validity. Implementation analysis aims at increasing external validity through the explanation principle (Mark 2005): if one understands how the context influences implementation and effects, one can better predict if generalization of the intervention in other contexts might possibly lead to the same effects (Champagne and Denis 1992).

Implementation analysis can focus on three distinct questions:

1. How does the context influence implementation of the intervention? This issue goes further than normative assessment of fidelity in implementation by analyzing the reasons for discrepancy between planned and actual implementation.
2. How do variations in implementation modify effects? This is particularly useful when interventions are implemented in a large number of settings. Typically in such cases, implementation will not be homogenous and will vary from one setting to another. Analyzing how this influence effects is a prime concern. This question is also useful for the evaluation of complicated interventions involving a wide variety of means and strategies. Attributing effects to some particular subset of these could lead to beneficial streamlining.
3. How does the context modify the production of effects? The question here is one of interaction between the context and the intervention in the production of effects. The context can indeed often act either synergistically or antagonistically, amplifying or limiting effects. This question is almost always of interest but may be particularly relevant in the case of complex interventions, which are by nature finely embedded in their context and barely distinguishable from it.

A wide range of methods can be used for implementation analysis. When implementation takes place in a large number of settings, correlational studies can be conducted. In most instances, however, interventions are implemented in a limited number of settings and qualitative case studies will best serve to analyze implementation.

10.4 Questions to Be Considered Before Choosing from the Evaluation Menu

Table 10.2 presents an overview of the comprehensive integrative framework presented above comprising two approaches, six criteria and nine types of evaluation. No evaluation can nor should cover all of the different types of evaluation. Selection from this evaluative menu should follow consideration of a series of questions preliminary to any evaluation.

10.4.1 What do You Emphasize the Most as an Evaluator?

Evaluators have different perspectives on what should be the evaluation's guiding force. Alkin (2004) identified three distinct schools of thought. Some evaluators think that rigor of methods is the ultimate criterion of a good evaluation. They place emphasis on using the most robust methods possible so as to increase internal validity and reduce *bias*. Proponents of this school of thought include Donald Campbell and his descendants in the social quasi-experimentation perspective. A second school of evaluation places use as the ultimate goal. A good evaluation is one whose results or even process gets used and is useful to specific users. Michael Quinn Patton and his utilization-focused evaluation movement is the prime exemplar of this perspective. Finally, a third school considers valuing as the ultimate evaluation challenge, appropriate consideration and incorporation of stakeholders often divergent values and perspectives being the criterion of a high quality evaluation. Michael Scriven as well as Guba and Lincoln's fourth generation naturalistic evaluation perspective (Guba and Lincoln 1989) are strong advocates of this perspective. Although rigor, use, and valuing are obviously not in direct opposition, which one is perceived as being predominant will indeed influence choices to be made in designing a specific evaluation.

10.4.2 Who Are the Evaluation Stakeholders?

A second issue to be addressed is the identification and management of the evaluation stakeholders. Every evaluation involves a wide range of stakeholders, including clients, funders, managers, staff, evaluators, and others. Each of these parties might have different stakes in the intervention and distinct stakes in the evaluation

Table 10.2 Approaches, criteria and types of evaluation

	Approaches (2)	
	Normative approach	Relational approach
Criteria (6)	Types (9)	
Relevance	–	Strategic analysis
Plausibility	–	Logic analysis
Quality	Assessment of process	Analysis of production
Effects	Assessment of outcomes (goal attainment)	Analysis of effects
Implementation	Assessment of structure and process	Analysis of implementation
Costs	Assessment of structure and process	Analysis of production Analysis of efficiency

of the intervention. The evaluators have to decide how they will manage this multiple stakeholders situation, that is, who they will involve in the evaluation and how. This again will be a matter of style and perspective. Some evaluators will favor a highly participative process involving intensely a wide range of stakeholders (as in naturalistic and in empowerment evaluations). Others will involve intensely a limited number of targeted users (as in utilization-focused evaluation). Some evaluators will limit participation to transfer of results, arguing for the necessity of independent "arms-length evaluation". In any case, identification of the evaluation's intended users and consideration of their involvement in the evaluation process is an issue to be addressed very early in the evaluation.

10.4.3 What Is the Evaluation Context?

There are three distinct contexts or situations of evaluation: (1) a management and improvement context, (2) a summative decision context, and (3) a strategic context. In a context of management and improvement, the evaluation serves to provide information for the modification or more generally the management control of the intervention. The goal of the evaluation is primarily formative. In a management and improvement context, the evaluation addresses one or both of the following general questions: "Are we doing things right?" and "Where can we improve?" Such evaluations are based primarily on a normative approach and focus on the measurement of the discrepancy between one or many components of the intervention and corresponding criteria or standards. For example, one might examine differences between objectives planned and objectives met, between provisional costs and real costs, between activities (or services) planned and activities executed, and between activities executed and best practices. In this evaluation context, judgments are based in large part on the conformity to standards in terms of fidelity, coverage, quality, cost, and goal attainment and rely on three types of evaluation: ***assessment of structure***, ***assessment of process***, ***and assessment of outcomes***. In addition, other types of evaluation based on a relational approach can also be useful in an improvement context. ***Analysis of production*** will provide information useful for improving quality and productivity while ***implementation analysis*** focused on factors influencing implementation will provide knowledge useful for increasing intervention fidelity.

In a *summative* decision context, the evaluation seeks to contribute to decisions on the pursuit or extension of an intervention (summative goal). Such evaluation are primarily aimed at generating local evidence on the worth of the intervention through ***analysis of effects*** (Does it work?) and at determining value for money as compared to other alternative interventions through ***analysis of efficiency*** (Is it worth it?).

In a *strategic context*, the goal of the intervention is primarily developmental. Here, the focus is on questions such as: *Is the intervention well targeted*? *Is it well-designed*? *What works specifically*? *How does it work*? *Under what conditions does it work*? *For whom does it work*? Three types of evaluation, calling for different methods, can be performed: ***strategic analysis***, ***logic analysis***, ***and implementation analysis***.

10.4.4 What Is the Nature of the Intervention?

A last issue to be addressed is the specification of the exact nature of the intervention. This is one of the evaluator's most pressing and central tasks. Specification of the intervention can beneficially take the form of logic modeling. According to Le Moigne (1990), modeling is"the act of intentionally elaborating and constructing, by composition of symbols, models that are likely to render intelligible a perceived complex phenomenon, and to amplify the actors' reasoning by projecting a deliberate intervention into the phenomenon; this reasoning should also help anticipate other outcomes. Modelling is used to understand, to amplify meaning, to construct the intelligibility of a complex system" (p. 5). Construction of a

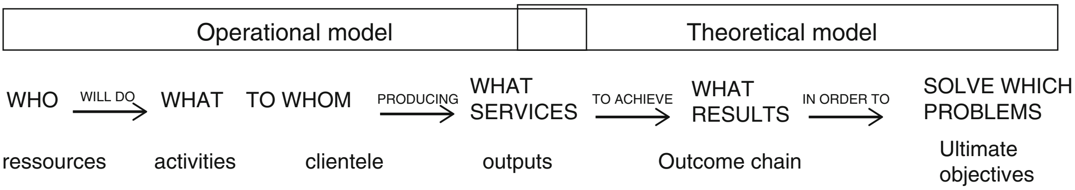

Fig. 10.4 The building blocks of a logic model

logic model of the intervention stems from the *program theory*. As Wholey wrote (1987), "a program theory identifies program resources, program activities, and intended program outcomes, and specifies a chain of causal assumptions linking program resources, activities, intermediate outcomes, and ultimate goals" (p. 78). A logic model thus documents the nature of an intervention: which activities it does with which resources; which outputs it produces for which groups of clients; which results these outputs will produce; which goals or strategic objectives the intervention tries to achieve in the long term (Fig. 10.4).

Modeling helps clarify how the intervention works to produce the desired effects. A thorough understanding of underlying causal mechanisms can be achieved by breaking down the intervention into its components as per the generic model presented previously, incorporating details for each, and specifying the links between components or specific elements of the components. Modeling consists of making explicit the causal model of the intended effects of the intervention. An intervention logic model stems from either a formal intervention theory, based explicitly on scientific evidence, or an implicit intervention theory, based on a combination of experience, intuition and practical knowledge. The model should reflect the complexity of the intervention under scrutiny.

Logic modeling is the process of developing a logic model, usually along with stakeholders. Such participative process encourages iterative development and specification of the logic model. It also serves as a mechanism of knowledge transfer among evaluation team members by offering highly participatory learning opportunities. By enabling the construction of shared mental models, it builds cohesion among stakeholders and facilitates joint construction of the evaluation. It is also a means for the combination of the practical knowledge of individuals and groups and scientific knowledge.

A logic model can be developed and critiqued with four quality criteria in mind:

- Is the model *clear* in its detailed representation of the intervention's components?
- Is the model *logical*?
- Is the model *informed* (knowledge-based)?
- Is the model *useful* for evaluation? i.e., does it help in selecting evaluation criteria and indicators?

10.4.5 An Example: Evaluation of the PREVICAP Program

Starting in 2001, a team of investigators evaluated the PREVICAP work rehabilitation program (PREVention of work handICAP) in place between 2001 and 2004 in four pilot regions involving four Québec rehabilitation centers and eleven regional offices of the Québec compensation board (the CSST). A detailed report of the objectives, methods and results of this evaluation project is available elsewhere (Rivard et al. 2011).

The PREVICAP program is designed to foster workers' return to their pre-injury jobs. It consists, among other things, of the early and interdisciplinary management of workers with musculoskeletal disorders (MSDs) who are at risk of long-term disability, in partnership with all the stakeholders impacted by the injury (the injured worker, the employer, the CSST case manager and health professionals).

The purpose of the evaluation was to provide the CSST with the elements needed to make an informed decision as to whether it would be in the CSST's interest to adopt the PREVICAP program to deal with the problem of MSD-related occupational disability. The evaluation strategy was designed to account for the fact that the PREVICAP program was part of a complex problem involving major human, social, and economic issues, and involving many stakeholders not necessarily having the same interests or perceptions of the disability problem associated with occupational musculoskeletal injuries. The intent was for the evaluation process to be as comprehensive as possible. The logic model of the program (Durand et al. 2003) was useful for the formulation of specific objectives, the elaboration of data collection tools, and the analysis of the information collected.

A mixed methods approach was developed in order to address a variety of evaluation questions related to its implementation (implementation analysis), its effectiveness (analysis of effects) and its economic performance (analysis of efficiency). Several study designs were used including a multiple-case study to document the level of and variations in program implementation in the four pilot regions (the four cases), and a quasi-experimental study to determine the program's effectiveness and efficiency by comparing the situation of workers enrolled in the PREVICAP program (experimental group) to the situation of those receiving the usual services (control group) over a period of 3 years following the work injury.

The ***implementation analysis*** shed light on the conditions needed for a successful implementation of the PREVICAP intervention and the process whereby it produced results, notably in terms of return to the pre-injury job. It also brought to the fore the determining factors which were conducive or detrimental to implementation and success of the PREVICAP model in the workplace.

The main objective of the ***analysis of effects*** was to assess the program's effectiveness in terms of return to work (RTW). It primarily involved assessing whether the PREVICAP program contributed to a prompter sustainable RTW to pre-injury job compared with the CSST's usual case management approach. Other indicators of effectiveness were analyzed including the time duration until suspension of CSST compensation benefits.

Lastly, the ***analysis of efficiency*** provided information on the costs of the PREVICAP program both for the CSST (compensation costs) and for workers (private costs) compared with the CSST's usual case management approach. In addition, the relative performance of the program was examined with cost-effectiveness and cost-benefit analyses.

Table 10.3 summarizes the evaluation scheme that was used in relation with the proposed integrative framework.

In brief, results of the evaluation suggested that a large-scale implementation of this type of program poses many challenges, that the program is effective, and that, despite its relatively high cost, it is at least as advantageous as usual case management for workers who

Table 10.3 The PREVICAP evaluation approach

Evaluation question	Type of evaluation
Are the resources allocated as planned?	Assessment of structure
Are the services provided as planned?	Assessment of process
What is the cost of the program?	Analysis of productivity
Which factors facilitate or hinder the implementation of the program?	Implementation analysis
What is the impact of the program compared to usual services?	Analysis of effects (effectiveness)
Is the program worth the cost?	Analysis of efficiency (cost-effectiveness; cost-benefit)
Which special features of the program explain the program's success or failure?	Implementation analysis
Which characteristics of the environment explain the program's success or failure?	Implementation analysis
Does effectiveness vary among subgroups of workers?	Analysis of effects (effectiveness-subgroup analyses)
Does efficiency vary among subgroups of workers?	Analysis of efficiency (cost-benefit—subgroup analyses)

have been compensated for MSDs for many weeks, if not months.

The fact that this evaluation of the PREVICAP program was completed in a *real-world* setting enhances the usefulness of the results from a decision-making standpoint. Also, the major strengths of this evaluation are its scope, the robustness of its methods and the ensuing high validity of its results. These results must nonetheless be interpreted taking into account the *environment* in which this evaluative research was conducted. The evaluation team faced many challenges while conducting the evaluation; these revolved around interrelated issues of stakeholder participation, evaluation methods and time constraints.

The acceptability of the pilot project and, subsequently, of the evaluation project, was not the same for all actors involved. Collaboration between investigators and some representatives of an important stakeholder group proved to be difficult at times. Some individuals were reluctant to participate in the evaluation process for a variety of reasons: doubts with respect to the merits of the PREVICAP program, resentment at not having been invited to play an active role in the planning of the pilot project and/or the evaluation project, fear of being targeted and judged through this evaluation, and misunderstanding of the complex evaluation scheme. This collaboration was further complicated because of different and sometimes conflicting stakes, particularly around issues of timing. The decision-maker (the CSST) was hoping for a quick response to what were perceived to be simple questions such as: does the program work, for whom and at what cost? The evaluators' main concern was to provide valid answers to these questions. For them, following the *rigor of methods* school of thought discussed earlier, valid methods yield valid results. In this case, obtaining valid results was impossible to achieve in a time frame compatible with the decision-maker's expectations. Notably, time issues are certainly not unique to program evaluation in the field of return to work. They are a common obstacle or source of friction. Other evaluators, adhering to a *utilization-focused* approach might have handled this time issue differently.

Several methodological issues had to be addressed in the evaluation of the PREVICAP program. Initially, the main design for the effectiveness and economic analyses was a randomized design. Following approval of the project by an external board of reviewers, a major stakeholder withdrew its support for a randomized study, arguing that allocation of workers to the control group (unexposed to PREVICAP) would be unethical. The evaluation team failed to convince this stakeholder that the rationale for the evaluation was that the value of the PREVICAP program still needed to be ascertained and that therefore, a randomized design was not only ethical but also preferable in terms of validity. The evaluation team was asked to develop an alternative proposal. In order to maintain a high level of validity, the team suggested combining multiple designs including a quasi-experimental design as a replacement for the original randomized design. In the quasi-experimental design, the specification of an appropriate control group of injured workers constituted a major methodological challenge. This challenge would prove to be further complicated by the logistics of identification of control workers from the CSST databases.

The evaluation project relied heavily on access and use by the evaluation team of administrative data (CSST data). The data were sent by the CSST with significant delays, mainly because a process of data validation had to be implemented to ensure that the data sent had been correctly extracted from the CSST databases, according to the prespecified criteria set by the evaluation team.

Multiple delays, related to the final approval of the research protocol and more importantly to the onset of data collection, affected the realization of the evaluation project. Consequently, the evaluation team could not conduct the evaluation in *real time*, i.e., concurrently with implementation of the pilot project. Because of that lag time between the time of injury and the time of the first interview with the worker, some information was unavailable or had to be discarded due to poor reliability (e.g., worker's initial expectations towards an eventual return to work; worker's functional status soon after the time of injury). This situation had two consequences. First, despite the sophisticated methodological apparatus used, the control of some biases (e.g., confounding bias) was imperfect. Second, certain study design components originally planned (employer survey, physician survey, tracer cases) either became unfeasible or did not produce sufficiently informative results. Lacking information on the viewpoints or perceptions of two categories of key stakeholders (employers and physicians) resulted in a limited understanding of the mechanisms underlying the observed effects of the program.

Case referral during the pilot project was lower than planned. The smaller volume of cases referred to the PREVICAP program was counterbalanced in part by enrolling in the study a larger number of control workers, thus ensuring adequate statistical power to address the main objectives related to effectiveness and efficiency of PREVICAP. However, the study was statistically underpowered to investigate the profile(s) of workers for whom the program produced the best outcomes (subgroup analyses). Due to the exploratory nature of these analyses, as well as the inability to take into account other factors possibly contributing to the program's success or failure (e.g., the worker's and employer's levels of motivation to participate in the program), the evaluation team could not make firm recommendations in terms of criteria to define a target clientele for the PREVICAP program if a province-wide implementation was to be considered.

The pilot project was implemented in a *real-world* or natural setting. It involved many actors from many organizations (4 PREVICAP centers, 11 CSST regional offices, as many workplaces as study participants), and the study population was very diverse in terms of occupational profile (type of workplace, type of job, etc.). Ruling on the value of the PREVICAP program in this setting was more difficult than in a more controlled setting with a restricted number of actors all willing to participate to the project. However, evaluation in a natural setting provides an estimate of user effectiveness rather than trial effectiveness thus enhancing the transferability of evaluation results (external validity).

10.5 Conclusions

Evaluation in the field of return to work can certainly be characterized by its diversity: *diversity of interventions* as it involves many different types from complex interventions based on a mix of clinical, social, psychological and organizational theories, to simpler interventions focusing on a limited number of determinants; *diversity of stakeholders* as workers, employers, compensation agencies, unions, diverse providers (physicians, other clinicians and service providers), and diverse researchers from a wide range of fields have interests in evaluations of RTW interventions; and *diversity of evaluation needs* in a *diversity of evaluation contexts*: management control, improvement, summative decisions and fundamental generation of knowledge. The integrative framework presented in this chapter can serve to devise evaluation strategies coherent with the context and goals of the evaluation and the nature of the interventions. It can also provide a common unifying language contributing to creating a stronger body of knowledge on RTW interventions.

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11

Measurement of Return to Work and Stay at Work Outcomes

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List of Abbreviations

SSDI	Social security disability insurance
SSI	Supplemental security income
HIPAA	Health Insurance Portability and Accountability Act
FCE	Functional capacity evaluation
WAI	Work ability index
WLQ	Work limitation questionnaire
SPS	Stanford presenteeism scale
HPQ	Health and work performance questionnaire
LEAPS	Lam employment absence and productivity scale

11.1 Introduction

Millions of dollars are spent every year on interventions to help injured workers return to work. To fully understand and treat work related disorders, it is commonly acknowledged that a biopsychosocial frame of reference is necessary, encompassing not only the traditional medical perspective, but also an understanding of the psychological, spiritual, social, and economic aspects of the patient's life and current circumstances. Ultimately, treatment success is judged upon operational and functional, rather than medical or psychological criteria, centering on the specific behavioral outcomes of return to work and work retention. With the escalation of health care costs, particularly in the USA, providers treating injured workers are increasingly being judged by these criteria as the ultimate arbiter of the success of their interventions. This chapter discusses the various ways in which these outcomes can be measured, and other factors that may influence them.

In order to accurately assess the outcomes associated with work absence, the criteria for determining return to work and work retention must be clearly defined. The following section outlines a process for assessing work return and work retention based on the procedures put forth by a successful functional restoration program that treats patients with chronic disabling occupational musculoskeletal disorders (Mayer & Mayer 2012; 2000; 1987a, b).

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11.2 Measures of Return to Work

11.2.1 Work Status

A structured clinical interview to collect outcome information is essential to ensure that all patients are asked the same sequence of questions, so that all pertinent information is collected in a thorough and systematic process. Individuals conducting the post-treatment interviews should be adequately trained not only to collect all of the required information, but also to recognize potential misinformation provided by the patients. From a quantitative perspective, data collected on an interval/ratio scale is more informative than nominal variables. For example, if interested in post-treatment measures of treatment satisfaction, rather than asking if a patient was satisfied with their treatment (nominal scale), we recommend to ask to what extent the patient was satisfied (using a Likert scale). Moreover, we advise to specify certain areas within the realm of satisfaction (i.e., satisfied with doctor, nurses, physical therapists, scheduling, etc.) as to gain a greater perspective and variation of this "treatment satisfaction" variable.

It is common to assess post-treatment outcomes at a 1-year follow-up interview. To evaluate return to work 1-year post-treatment, the interviewer should initially ask whether or not the patient did return to work. However, it is also essential to report specific information regarding their post-treatment employment. It is crucial to the data collection process to use a standardized data code sheet that specifies detailed factors, including specific dates and date ranges for all post-treatment employment. Furthermore, the code sheet should contain a range of broad-based industries, for which any general job would fall. Such categories can include: Professional, Managerial, Clerical, Sales, Service, Agricultural, Refining, Machine Trade, Light Manufacturing, and Construction (Mayer et al. 2002). Another important factor to consider when evaluating return to work outcomes following an occupational injury is the physical demand required for the post-treatment job. From a quantitative perspective, this factor can be assessed by evaluating the maximum weight required for frequent lifting, and then categorizing the levels of physical demand into groups such as Sedentary, Light, Medium, and Heavy lifting. Also, it is important to note whether or not vibration is present for the physical lifting requirements. Both the type of industry and physical demands are essential variables to collect when assessing post-treatment return to work outcomes.

Not only is it important to assess whether or not the patient returns to work following treatment for chronic disabling occupational musculoskeletal disorders, it is imperative to evaluate work retention, or staying at work after the initial return. Work retention is often a better indicator of post-treatment success because it implies an adequate recovery from a lengthy duration of disability. By retaining work, the patient shows that he or she is able to cope with workplace demands. To evaluate work retention as a successful treatment outcome, the interviewer should obtain specific information regarding dates of employment and whether the patient is currently employed at the time of the 1-year follow-up assessment. Furthermore, specifics regarding the workload should also be collected, such as the number of hours per week working, and how the work differs from pre-injury employment (Mayer et al. 2000). Measuring the success of a treatment program does not solely lie with whether or not the patient returned and retained work at follow-up. Often, success can be assessed in non-traditional work, such as being retired, being a homemaker and even doing volunteer work (Mayer et al. 2000).

Of course, depending on the individual's situation, there are factors that may interfere with or inhibit the ability to obtain and sustain employment post-treatment. It is well understood that treating patients with chronic disabling occupational musculoskeletal disorders requires an interdisciplinary approach. Doing so not only addresses the physical injury, but also targets any psychological and social factors that can exacerbate a pain condition and further interfere with the healing process (Gatchel 2004; Mayer and Mayer 2012). Therefore, the interviewer must also assess the presence of any comorbid conditions that may interfere with returning and retaining work. Following a successful treatment program, some patients still maintain difficulties with basic functional capacities, such as standing, bending, and/or lifting.

Also, psychosocial factors can be problematic with respect to the return to work. Patients with high levels of psychological distress or fear-avoidance issues may be less likely to feel ready to return to work (Dersh et al. 2007). Also, depending on the nature of their pre-injury work, the patient may find difficulty in securing a job, which does not reflect their intent to return to work (Mayer et al. 2002). These psychosocial factors must be considered, and if possible, documented, to truly assess the post-treatment outcomes associated with return to work and work retention in patients treated for chronic disabling occupational musculoskeletal disorders.

11.2.2 Sickness Absence

Sickness absence is a measure of work incapacity. It can be studied at a variety of different structural levels, including that of the individual, the organization, and the society. On the level of the individual, sickness absence can be viewed as a means of communicating general health and functional capacity (Marmot et al. 1995). Factors such as gender, age, and personality differences can all contribute to sickness absence. At the organizational level, sickness absence reflects the psychosocial state of an individual's work environment (North et al. 1996). On a national level, sickness absence is a significant public health problem. Beyond the massive economic costs, studies have found that men and women with more than 15 days of sickness absence per year are at an increased risk for early retirement for medical reasons and also have a higher risk of early mortality. All of these findings have made sickness absence a public health priority and have inspired efforts to promote further research on sickness absence (Roelen et al. 2010). Although sickness absence is studied primarily in the medical literature, other fields of inquiry make use of the measure, including economics and sociology.

In the study of return to work, sickness absence is used for a variety of different reasons. As opposed to work status, which is a categorical variable, sickness absence is a continuous variable. Consequently, it can open up the possibility for more powerful and diverse statistical calculations. Sickness absence can also be combined with return to work data in order to provide a clearer picture of how employees perform once they return to work (Linton and Bradley 1992).

There is no standardized source for sickness absence data. Therefore, when comparing studies that utilize sickness absence data, it is important to consider the source of the data. Different studies use a variety of different methods to collect sickness absence data and the chosen source of data depends on the aims and location of the study. Sources include, but are not limited to, insurance carriers (either national or public), employer data, workers' compensation, government censuses, corporate health registers, and patient self-reports (Väänänen et al. 2003). Since insurance systems and centralization of health care vary by country, each insurance system or government agency has its own rules and protocols for collecting and monitoring sickness absence data. It is important to keep in mind that the reliability of sickness absence data can vary substantially depending on the source. Private health care settings usually rely on a patient's retrospective report. Although scientific literature has established the validity of self-reported data, it remains a subjective measure and therefore might not always be accurate, particularly when reporting cumulative absences over long periods of time. Despite this caveat, self-reports of sickness absence have been demonstrated to be quite reliable (Linton 2011). However, some studies have found that precision of self-reports of the length of sickness absence episodes decreases as the length of each episode increases (Grøvle et al. 2011).

Sickness absence data can be used for a variety of purposes. It can be used to measure the sickness burden to an employer or help calculate total economic costs for certain conditions (Dagenais et al. 2008). As we will cover later in the chapter, sickness absence can also be used to ascertain whether a previous disability or illness has returned. Sickness absence can be measured in several different ways, including total number of sickness absence days, frequency of sick leave, and duration of sick leave.

Total number of sickness absence days is the aggregate days an individual or a group of individuals has been absent. It can be used to assess how illness is affecting a certain organization or a society or to measure the effects of illness in a region, country, or company. Depending on the aims of the study, total number of sickness absence days can include sick days due to any cause, or may be limited to sick days due to a specific cause (Hensing et al. 1998a, b).

Sick leave frequency is the number of sick leave episodes initiated during a specified unit of time, usually the study period itself. It has been suggested as a basic measure of sickness absence. Sick leave frequency is suitable for analysis from the economic or workplace perspective. It can also help reveal the burden of sickness absence within a specific population or a region by comparing sickness absence between countries and populations (Hensing et al. 1998a, b). Length of each individual absence is another time-based measurement. However, whereas the number of total sickness absence days adds up the sickness days for all absence episodes, sickness absence duration provides the individual length of each absence. The distribution of the length of sickness absence spells is positively skewed. The majority of individuals will have short-term absences and a small minority will have long-term absences (Hensing 2009). Therefore, studies will usually separate long-term absences from short-term absences depending on certain criteria. Short-term sickness absences are common in infectious diseases such as influenza, while long-term sickness absence is more common in musculoskeletal disorders and psychiatric illness (Hensing et al. 1998a, b).

Sickness absence is a biopsychosocial issue. It can be influenced by health status, the social insurance system of the individual, work environment, attitudes, commitment to work, and other medical, social and psychological factors (Hensing et al. 1998a, b). Sickness absence has many antecedents and varying factors that contribute to the absenteeism of an individual. Research has shown that job autonomy can also strongly influence employee absenteeism. Factors such as coworker support, physical symptoms, and job characteristics can play a role as well. Finally, gender has also been showed to correlate with sickness absence, with women showing more sick leave episodes than men in a number of studies (North et al. 1996; Vishwanath 1990). Economic incentives can also influence sickness absence. Studies have shown that with more generous sickness insurance schemes, higher rates of sickness absence are reported (Alexanderson et al. 2004).

11.2.3 Temporary Disability Benefits

In the USA, there are no national temporary disability benefits programs for non-work related injuries or illnesses. However, many employers offer short-term and long-term disability insurance benefits as part of a benefits package. According to the National Compensation Survey conducted in 2011, approximately a third of civilian workers had access to employer sponsored short-term and long-term disability benefits, and over 95 % of workers with access to short- and long-term disability coverage participate in the benefit plans (US Bureau of Labor Statistics 2011a). If short-term and long-term disability are not offered through an employer, these types of insurance plans can be purchased on an individual basis. For most workers, temporary disability benefit programs are separate from health insurance plans.

According to the Bureau of Labor Statistics, short-term disability plans provide benefits for non-work related illness or injuries, in most cases for 6–12 months, depending on the specific plan (US Bureau of Labor Statistics 2011b). Short-term disability benefits are intended to replace lost wages and are usually based on a percentage of prior earnings. The mean percentage of annual earnings replaced by short-term disability plans in 2011 was 63.4 % (US Bureau of Labor Statistics 2011a). A few states require employers to offer short-term disability plans to all employees, including Hawaii, New Jersey, and New York (US Bureau of Labor Statistics 2011a).

In contrast, long-term disability plans provide wage-replacement for non-work related illness and injuries that cause the beneficiary to be unable to work for an extended period of time. Most plans have a 3–6 month waiting period, and this often requires the exhaustion of short-term disability benefits and sick leave. Most long-term disability benefits pay a percentage of the workers' wages; the mean percentage in 2011 was 59 % of annual earnings (US Bureau of Labor Statistics 2011a). Long-term disability benefits may continue until retirement, or may be provided for a specific time period based on the employee's age at time of disability (US Bureau of Labor Statistics 2011b).

Temporary disability benefits may be useful in predicting an individual's likelihood of returning to work. If benefit plans are generous, workers may be more likely to remain off work for longer periods of time, as benefits are usually terminated as soon as the employee returns to work and partial disability payments are not offered. However, as most benefit programs only reimburse about two-thirds of annual earnings, financial losses may motivate workers to return to work as soon as possible.

11.2.4 Permanent Disability Benefits

In the USA, permanent disability benefits are administered by the Social Security Administration. There are two main benefit programs for persons with disabilities: Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI). SSDI provides benefits for workers unable to engage in any substantial gainful activity due to physical or mental impairment expected to last at least a year (Social Security Administration 1997). To be eligible for SSDI, workers must have been employed for at least 60 of the preceding 120 months, and there is a 5-month waiting period before payments begin. After receiving SSDI for 2 years, beneficiaries become eligible for health care under the Medicare system. Recent changes to the SSDI system have aimed to encourage return to work. Trial work periods are allowed for 9 months without loss of benefits, and benefits may continue past the trial period if earnings do not exceed $1,000 per month (Social Security Administration 2011b).

The SSI program provides benefits for people who are disabled, blind, or over the age of 65 with little means or income. To qualify for SSI, a person must not have any assets exceeding $2,000 (Social Security Administration 2011a). In addition, many people who receive SSI qualify for health care for low-income persons through state-administered Medicaid programs. Programs to assist with food and housing costs are also available. If a person receiving SSI returns to work, half of any income over $85 per month is deducted from the SSI payment (Social Security Administration 2011b).

Receipt of SSDI or SSI benefits could potentially be used as a measure of return to work. Any information regarding beneficiaries is protected by privacy laws, such as the Health Insurance Portability and Accountability Act (HIPAA), therefore, the only practical way of ascertaining someone's SSDI or SSI status would be by self-report. However, in combination with work status, self-reported information about SSDI or SSI status can provide an additional measure of the severity of disability and the likelihood of return to work. SSDI and SSI beneficiaries rarely return to full time employment. In the year 2008, only 3.8 % of people receiving SSDI benefits resumed work with earnings exceeding $1,000 per month (Social Security Administration 2010a).

11.2.5 Workers' Compensation Benefits

In the USA, compensation programs for injured workers are separate from other health care and disability plans. Workers' compensation programs are administered by individual states, and regulations and benefits vary accordingly. Table 11.1 includes the program characteristics of workers' compensation programs in several

Table 11.1 Comparison of workers' compensation programs in four states

Benefit	Texas	California	New York	Washington
Medical coverage	All health care reasonably required by the nature of the injury as and when needed	Any health care that is required to reasonably cure or relieve the injured worker from the effects of his or her injury	Any medical care for such period as the nature of the injury or the process of recovery may require	Initial 20 physician office visits, routine diagnostic testing, and the first 12 physical therapy visits are automatically covered. Any additional treatment requires authorization from the department or self-insurer
Waiting period	7 days	3 days	7 days	3 days if disability lasts longer than 14 days
Temporary disability benefits	70–75 % of the wages until maximum improvement or 104 weeks	66 % of state average weekly earnings during disability period, maximum of 104 weeks	66.6 % the state average weekly wage	60–70 % of the worker's former wages scaled to number of dependents
Permanent partial disability benefits	66 % of average weekly wage, for 3 weeks per percentage point of impairment	66 % of average weekly earnings for up to 9 weeks Length of benefit is determined by percentage impairment	66.6 % of average weekly wage for maximum of 312 weeks Length of benefit is determined by the body part disabled	For loss of limb, compensation ranging from $498–$71,000 depending on severity
Supplemental benefits	For at least 15 % impairment and 20 % loss of earning power, 80 % of the difference between pre-injury and post-injury wages	66 % of weekly loss in wages during periods of temporary partial disability	66.6 % of the difference between the injured employee's average weekly wage prior to the accident, and the earning capacity after the accident	80 % of the difference between the earning power at the time of injury and the wages earned after injury, if loss of earning power is greater than 5 %
Lifetime benefits	For severe permanent injuries, 75 % of worker's average weekly wage	For permanent disability over 70 % but less that 100–1.5 % of average weekly earnings per disability percentage point over 60 % is paid until death For 100 % disability, average weekly wage with cost of living increases	66.6 % of average weekly wage for total disability	For permanent total disability, 60–70 % of the worker's former wages scaled to number of dependents
Return to work incentives	Employer can apply for reimbursement for the costs of providing workplace modifications for the disabled worker	If modified or alternative work is not provided by employer, or the employee is terminated, disability payments are increased by 15 %	Implementation of return to work program may qualify employer for discount rate on workers' compensation insurance	State may provide funding for workplace modifications

(continued)

Table 11.1 (continued)

Benefit	Texas	California	New York	Washington
Vocational retraining allowance	Provided by separate state agency	Job displacement voucher—funds tuition, fees, and other expenses for retraining or skills enhancement	Payable from separate vocational rehabilitation fund	If vocational plan is approved by WC department, may cover tuition, fees, books, supplies, and child-care related to retraining, up to $12,000 for 2 years
Return to work rates	93 %	91 %	76 %	78 %
Maximum benefit amount	100 % of the state average weekly wage	Maximum average weekly wage $515.38	$739.83 per week	120 % of the state average weekly wage

State of California 2011a, b; Wickizer et al. 2009; Texas Department of Insurance 2010; New York State 2011; New York State Insurance Department and State of New York Worker's Compensation Board 2009; The Gilmore Research Group 2007; Washington State Legislature 2011; Washington State Department of Labor and Industries 2011; Alexanderson et al. 2004; Texas Department of Insurance Workers' Compensation Research Group 2001

US states. Workers' compensation generally covers medical care for work-related injuries and wage replacement if income is lost for more than 7 days. In the state of Texas, employers have two options for funding workers' compensation programs: they may either purchase workers' compensation through a third-party insurance carrier or they may self-insure and assume all obligations for financing the care of injured workers (Texas Department of Insurance 2011).

Injured workers in Texas are entitled to "all health care reasonably required by the nature of the injury as and when needed" (Texas Department of Insurance 2010). This benefit includes doctor visits, diagnostic testing, surgery, rehabilitation, durable medical equipment, and medications. Workers are also entitled to income replacement benefits, which consist of four levels. Temporary Impairment Benefits are paid to employees who are disabled but are expected to improve in health status, and are payable at 70–75 % of the average weekly wage. These payments end when the employee reaches maximum medical improvement, which is a determination by a physician that no further improvement in the employee's condition is expected. The physician provides an impairment rating, which determines the percentage of work capacity that has been lost due to the injury. The worker is eligible for Impairment Income Benefits for a period of 3 weeks per percentage point of impairment. When these benefits expire, workers who have at least 15 % impairment and an income loss of at least 20 % of former earnings as a result of injury may qualify for Supplemental Income Benefits. Benefits are payable if the worker is participating in vocational rehabilitation, actively seeking work, or has returned to work with reduction in income. Workers with severe permanent injuries such as loss of sight, amputation of limbs, traumatic brain injuries, or severe burns may receive Lifetime Income Benefits that are payable until the death of the worker (Texas Department of Insurance 2010).

Benefit structures may influence how soon an individual returns to work or whether individuals file for workers' compensation at all. One study reported that workers' compensation utilization will increase by 5 % for every 10 % increase in benefits; with a benefit increase of 10 %, claims rise approximately 3 % and the duration of the disability increases by approximately 2 % (Gardner 1989). In addition, a slower return to work has been observed when benefits are increased (Galizzi and Boden 1996). Incentives to return to work in a timely manner, for both the employer and employee, include the facts that employees will not lose more earnings than needed, work skill may not deteriorate (beneficial to both parties), there may be no need to replace the employee, and the employee may still be seen as a valuable asset to the company (Galizzi and Boden 1996). On the other hand, individuals utilizing workers' compensation may actually have disincentives to return to work in a timely fashion. Return to work usually results in the termination of benefit payments, and if the individual does not have employer-provided health insurance, access to health care may be terminated as well.

11.2.6 Recurrence of Illness or Disability

After a patient has returned to work, it is important that they remain at work. However, there are times when a disability or an illness can return, creating a barrier to work retention. Recurrence can lead to frequent sick leave, and if left untreated, ultimately force an individual to leave his or her job. Recurrence is sometimes defined as the resumption of total disability compensation.

Recurrence of a disability or an illness can occur in a variety of ways. Surgery may have been performed that provided initial relief, but then the positive effects diminish over time. This is especially common in patients with lower back pain (Abenhaim et al. 1988). The condition may also be chronic, such as bronchial asthma, with intermittent symptomatic periods. Recurrence can also be caused by re-injury or the relapsing of symptoms related to a previous injury. In some cases, it may not be a re-injury, but an entirely new injury. Unfortunately, there are not many diagnostic tools that allow separation of a true recurrence and a truly new injury. Finally, therapeutic failure after a surgery can also lead to injury recurrence.

Recurrence can be calculated in a variety of ways. Researchers can gather absence data from organizations and then monitor other absences subsequent to the first absence episode (Abenhaim et al. 1988). However, repeated sickness absence might not accurately reflect recurrence of a disability. The worker may continue to work despite recurrence and thus not be listed as sickness absent (Roelen et al. 2010).

Recurrence data can also be obtained from either the patients themselves through self-report questionnaires or from workers' compensation insurance carriers, in the case of recurrent work-related injuries. If information is extracted from large insurance companies, the data can cover a broad range of states and organizations (Cifuentes et al. 2011). In countries with more centralized health care systems, recurrent sickness absence may be tracked by a government department or through national sickness absence insurance carriers (Koopmans et al. 2011).

11.2.7 Work Ability

Because return to work is such a complex, biopsychosocial phenomenon, no single assessment instrument can adequately capture the complexity of returning to work. This section will discuss instruments designed to asses a patient's ability to perform the duties of his or her job, as well as the purpose, psychometric properties, and use of these measurements. There are two general methods for evaluating work ability: objective measurement and patient self-report. Functional Capacity Evaluation is a standardized set of objective physical measurements intended to evaluate the functional ability of patients related to the requirements of a specific job. Self-report measures are questionnaires designed to measure perceived work ability and limitation.

11.2.7.1 Functional Capacity Evaluation

Functional Capacity Evaluation (FCE) is considered the "gold standard" of vocational assessment (McFadden et al. 2010). In general, the purpose of the FCE is to evaluate the capacity of a patient to perform work activities that may be impaired by an injury (Polatin et al. 2005). The FCE consists of a battery of tests relevant to work-related activities. The FCE compares the physical abilities of the patient with essential and critical job demands; it can also be used to determine job modifications necessary to enhance worker safety (Isernhagen 1995). Serial tests of the FCE can be used to assess a patient's progress during rehabilitation, and a final evaluation can inform a physician making an impairment rating to determine financial and medical disability benefits (Cotton et al. 2006). Most FCEs are performed by physical or occupational therapists, but in some cases occupational physicians may conduct FCEs as well.

There are a variety of methods used to perform FCEs. Among them are the Isernhagen work system, the Baltimore Therapeutic Equipment work simulator, the Blankenship system, the Ergos work simulator, the Ergo kit, and the Valpar Component Work Sample (Innes and Straker 1999; Gouttebarge et al. 2004). However, all these methods have a similar purpose, which is capacity assessment. Capacity assessment in FCE includes measurements of task speed, position tolerance, and motion repetitions per unit of time. It also includes evaluation of material and non-material handling, such as lifting, carrying, reaching, sitting, standing, bending, squatting, and walking. In addition to capacity testing, an overall assessment of the effort demonstrated by the patient is also obtained. Observing effort during the FCE is crucial so as to judge a patient's true capacity. Submaximal effort may be motivated by such factors as fear-avoidance or secondary gain. Therefore, the observing physician or therapist may express an opinion about effort demonstrated through consideration of visible exertion, substitution patterns, heart rate, and respiratory rate (Reneman et al. 2002; Polatin et al. 2005). In relation to return to work, the physician or therapist will make a recommendation based on the capacity evaluation results. The recommendation may be to return to the original job, return to the original job with modifications, or to change jobs. Although the FCE was originally constructed to assess the functional capacity of patients following workplace injury, it can also be applied to non-work-related injury or other chronic conditions.

An FCE requires several hours to complete, special equipment, and specially trained personnel. Therefore, it may not be practical for routine use in areas other than workers' compensation injuries. Researchers have attempted to design shorter and easier methods to evaluate functional capacity. For example, Gross, Battie´ and Asante (2007) were able to demonstrate the effectiveness of a short-form FCE related to recovery outcomes, but subsequent studies found that the short-form FCE predicts administrative outcome but not injury recurrence (Branton et al. 2010).

Overall, FCE is a sound measure of global work ability. It incorporates both physical ability and psychosocial condition (via effort ratings), thus giving an extensive picture of the patient's ability. Some studies have found that FCE has good predictive validity in regard to return to work recommendations over a span of 3 months (Cheng and Cheng 2010). However, the utility of FCE in predicting sustained return to work has not been conclusively established.

11.2.7.2 Self-Report Measures of Work Ability

The *Work Ability Index* (WAI) is a self-report instrument designed to assess an individual's perceived work ability. The WAI was constructed based on the concept of stress-strain, and contains subjective as well as objective items. It measures a person's perceived work ability by taking into account the specific work demands of the job, as well as the individual's health condition and mental resources (Ilmarinen 2009). The WAI is comprised of seven items with total scores ranges from 7 to 49. These scores can be divided into four categories: poor (7–27), moderate (28–36), good (37–43) and excellent (44–49).

Although all the separate items in WAI have good validity in predicting future disability (Alavinia et al. 2009)\, current factor analysis suggests two primary dimensions of WAI (Martus et al. 2010). One factor is subjectively estimated work ability and resources, and the other factor is termed ill health. The WAI has adequate psychometric properties (de Zwart et al. 2002), and has been found to reliably predict work disability, disability retirement, and early mortality (Ilmarinen and Tuomi 2004).

The WAI is useful both as a clinical and a research tool, providing information about a patient's perceived work ability related to health. It is a short and simple instrument that can also be used to document changes in perceived work ability during rehabilitation. The WAI is not only used for patients with work-related injuries, but also for patients being treated for cardiovascular disease or cancer.

The *Work Limitation Questionnaire* (WLQ) was constructed to determine the impact of chronic health conditions on job performance (Lerner et al. 2001) by measuring the degree to which chronic health problems interfere with specific domains of job performance. The WLQ is a self-report instrument available in two forms: the original long form, which includes 25 items, and the abbreviated short-form, which has eight items. There are also four subscales: time, physical demands, mental-interpersonal, and output demand. The time subscale (5 items) assesses time management and scheduling demands. The physical demands subscale (6 items) examines physical ability related to task performance, including movement, flexibility, coordination, and stamina. The mental-interpersonal subscale (9 items) evaluates cognitive and interpersonal function, while the output demand subscale (5 items) measures reductions in work quantity and quality (Lerner et al. 2001; Munir 2008). Each item is scored on a five point Likert scale, with higher scores indicating more severe limitations.

The WLQ has been validated with several populations; these include both physical conditions such as back pain, migraine headache, epilepsy, cancer, and obstructive sleep apnea and mental conditions such as depression and insomnia (Lerner et al. 2001; Yang et al. 2009; Nena et al. 2010; Peugeot 2009). The output demand subscale is particularly useful in predicting productivity (Williams et al. 2007). In addition, the WLQ can be used to assess sustained recovery after discharge, providing a detailed assessment of a patient's condition after returning to work.

11.2.7.3 Productivity

When a person is physically present at work, but unable to complete all the functions of his or her job due to illness, mental stress, or disability, decreases in job performance can be measured as loss of productivity. Several self-report instruments have been developed to measure productivity and its impact on the worker and the workplace.

One of the first widely used measures of health status and its relationship to productivity was the *Stanford Presenteeism Scale* (SPS) (Koopman et al. 2002). The scale was designed to capture two dimensions of presenteeism: (1) work focus, the process outcomes of work, and (2) psychological focus, the emotional, cognitive, and behavioral aspects of work. The SPS has six items, each scored on a five-point scale. The work focus items assess the worker's ability to handle job stress, complete tasks, and focus on goals. The psychological focus items assess the worker's levels of job satisfaction, energy level, and feelings of hopelessness about work. The SPS demonstrated excellent internal consistency (Cronbach's $\alpha = 0.80$) and construct validity (Koopman et al. 2002) and has been found to be useful in a variety of chronic conditions (Tang et al. 2009; Collins et al. 2005; Beaton et al. 2010).

In 2002, the World Health Organization developed the *Health and Work Performance Questionnaire* (HPQ) (Kessler et al. 2003). The HPQ has two components: presenteeism and absenteeism. Respondents answer a series of specific items asking them to rate their recent job performance on a ten point scale in a number of areas, including quantity of work, quality of work, interpersonal aspects of work, work-related successes and failures, and accidents or injuries. These questions are designed to elicit a sufficient memory search about their job performance before respondents rate their performance on a global work performance scale, from "worst possible work performance" to "top work performance." The absenteeism portion of the scale measures missed work days, partial work days, extra hours worked, and normally scheduled work hours (Kessler et al. 2003). The HPQ is considered the "gold standard" of productivity assessment (Lam et al. 2009). However, it contains 37 items and may take a significant amount of time to complete.

Finally, the *Lam Employment Absence and Productivity Scale* (LEAPS) was developed specifically to measure work functioning in workers with major depressive disorder (Lam et al. 2009). The scale has three sections: absenteeism, work productivity, and troublesome symptoms. Absenteeism is assessed by comparing the number of hours scheduled to the hours worked; the absenteeism rate is the percentage of scheduled hours that were not worked. The productivity subscale contains three items that evaluate the amount of work completed, the quality of the work, and the number of work errors. The remaining four items assess troublesome symptoms of depression. The LEAPS has been shown to correlate highly with the HPQ, and with only ten items may be a more efficient measure of work functioning in major depressive disorder (Lam et al. 2009). Table 11.2 summarizes the available measures of work ability and productivity.

11.3 Impact of Entitlements on Measurement of Return to Work

The structure of the health care delivery and social insurance systems can have significant impact on return to work rates, and should be considered carefully when evaluating return to work. In countries with extensive sickness benefits and universal health care, consequences for missing work may be mitigated, increasing the frequency and length of work absences. In the USA, where access to employer-funded health care may depend on disability status, returning to work may result in substantial losses, discouraging workers from attempting to return to work once benefits have been established. Additionally, in times of economic crisis and high unemployment, people who have reduced work capacity may be shifted from unemployment programs into disability programs, decreasing their likelihood of ever returning to work (Organisation for Economic Co-operation and Development 2009). Some of the primary entitlement influences on return to work are disability benefit programs, sickness absence benefits, worker's compensation programs and unemployment insurance.

The eligibility requirements and compensation rates for disability benefit programs vary widely between countries. For example, to receive disability benefits in the USA a person must be totally disabled and incapable of employment; however, in many European countries partial disability payments may be granted for as little as a 15 % reduction in work ability (Social Security Administration 2010b; Bloch and Prins 2001). In addition, compensation rates range from 75 % of prior wages in the Netherlands to a maximum of $660 (US) per week in Denmark. In some countries, access to health care is dependent on disability status. Disabled persons in the USA are eligible for Medicare after 2 years of disability, and those with limited income may qualify for Medicaid. In contrast, universal health care is provided to all residents of Canada and many European countries such as the UK, the Netherlands, and Germany.

Although there is no national program for sickness absence or sick-leave benefits in the USA, such programs are common in Canada and Europe. In the Netherlands, employers (or sickness absence insurers) are required to pay employees on sickness absence 70 % of their usual salary for up to 104 weeks (Social Security Administration 2010b). In Germany, Denmark, and Canada, the employer is responsible for providing 2–6 weeks of sickness absence pay, then funding for sickness absence is shifted to government programs (Social Security Administration 2010b, c). Programs of this type may increase the length of sickness absences because there is minimal loss of salary and little risk of employment termination. A study in the Netherlands found that the median length of sickness absence for persons with subclinical psychiatric symptoms (distress or adjustment disorder) was 7–14 weeks (Koopmans et al. 2011).

Most countries have programs to compensate workers for work-related injuries that are separate from disability and sickness absence systems. The exception to this is the Netherlands, which treats work-related injuries under the sickness absence program. Workers' compensation programs usually have temporary programs for injuries that are expected to resolve, with payments ranging from 66 to 90 % of prior income lasting from 6–52 weeks (Social Security Administration 2010b, c). For workers whose ability to perform job duties is permanently

Table 11.2 Summary of work ability and productivity measures

Instrument	Population	Construct measured	Time to administer	Number of items	Special equipment or personnel required	Additional information or subscales
Functional capacity evaluation	Physical injury or disability	Physical work capacity (task speed, position tolerance, material handling)	3–4 h	Varies depending on type of FCE	Yes	Effort rating Work recommendation
Work ability index	Physical or mental disability	Perceived work ability	10 min	7 items	No	Work ability and resources Ill health
Work limitation questionnaire	Physical or mental disability	Impact of health on job performance	10–25 min depending on form used	Long-form 25 items Short-form 8 items	No	Time management Physical demands Mental-interpersonal Output demands
Stanford presenteeism scale	Physical or mental disability	Relationship of health to productivity	10 min	6 items	No	Work focus Psychological focus
WHO health and work performance questionnaire	Physical or mental disability	Presenteeism and absenteeism	30–45 min	37 items	No	Specific job task performance Global work performance Missed and partial work days
Lam employment absence and productivity scale	Major depressive disorder	Work Functioning	10 min	10 items	No	Absenteeism Work productivity Troublesome symptoms

impaired, payments are usually scaled according to the degree of impairment. In the USA and Denmark, a permanent disability award includes unrestricted access to health care related to the injury (Social Security Administration 2010b, c).

Finally, unemployment benefits are offered to workers who have lost their jobs, and are often restricted to those who left their jobs involuntarily and who were not terminated due to misconduct (Social Security Administration 2010b, c). In the USA, unemployment benefits are only available to persons who are not working in any capacity. However, in the Netherlands, unemployment benefits are available for a loss of employment as small as 5 h a week. Denmark provides unemployment benefits to part time workers, and in Germany, unemployment programs compensate construction workers who are unable to work due to weather conditions (Social Security Administration 2010b, c). In addition, a few countries offer housing assistance to the unemployed. In the UK, the government pays the mortgage interest of people who have been unemployed for at least 9 months. In the Netherlands, home-owners who are unable to make mortgage payments may qualify for a means-tested subsidy to cover housing costs (Scanlon and Whitehead 2004).

The effects of these different benefit systems on return to work should always be considered when measuring return to work. A comparison study of six countries found the following rates of return to work after chronic disabling back pain: USA 49 %, Sweden 39 %, Germany 22 %, Denmark 31 %, Israel 49 %, and the Netherlands 62 % (Anema et al. 2009). The study identified two compensation policy aspects that predicted earlier sustained return to work: requirements of less than 50 % work incapacity and less than 3 months of impairment to qualify for disability benefits (Anema et al. 2009). The high rate of return to work in the Netherlands may be related to the fact that return to work and receipt of sickness, disability, and work injury benefits are not mutually exclusive. As many as 19 % of those who return to work in the Netherlands continue to receive disability or other benefit payments (Bloch and Prins 2001). Protection from termination is another policy factor that may influence return to work rates. Particularly in times of economic difficulty, workers who are terminated from their jobs may struggle to find new employment. In countries that prevent employers from terminating ill or disabled workers, only about 7–12 % of workers return to jobs that pay less than their pre-injury jobs, and more than 65 % of workers return to the same occupation (Bloch and Prins 2001). Table 11.3 describes the social insurance programs in five North American and European countries.

Differences in benefit systems may produce different effects in studies of interventions designed to improve return to work outcomes. In systems where there is a higher likelihood of job termination following disability and where disability benefits require total work incapacity, such as the USA, multidisciplinary rehabilitation programs for chronic disabling occupational musculoskeletal disorders have large and significant effects on the number of patients who return to work, and the number of patients who retain work after injury (Dersh et al. 2008; Evans et al. 2001; Kidner et al. 2009; Mayer and Gatchel 1988; Mayer et al. 1985; Mayer et al. 2002; Mayer et al. 2001; Mayer et al. 1987a, b; Mayer et al. 1999; Mayer et al. 1998; McGeary et al. 2006; Proctor et al. 2006). However, in systems with less stringent eligibility requirements for disability benefits and a lower likelihood of job termination, beneficial effects from multidisciplinary rehabilitation for chronic low back pain are found in the reduction of sickness absence days and disability pension awards and the subsequently lower total costs of treatment (Bendix et al. 1998; Jousset et al. 2004; Jensen et al. 2005). Therefore, the incentives and disincentives to return to work provided by the socioeconomic structure of the disability and rehabilitation system should be considered when choosing an appropriate measure of return to work.

11.4 Return to Work in Other Clinical Populations

Although the majority of research on return to work has focused on chronic pain and musculoskeletal disorders, return to work is an important

Table 11.3 Comparison of social insurance programs in five countries

Benefit type	Characteristics	USA	Canada	Netherlands	Germany	Denmark
Disability benefits						
	Eligibility	100 % disability—incapable of any substantial gainful activity	100 % disability—severe prolonged incapacity for any gainful activity	At least 15–25 % disability	Loss of at least 3 working hour per day	At least 50 % disability
	% of wages replaced	Percentage varies based on average covered earnings	$419 (US) per month plus 20 % of average monthly earnings	14–70 % of average earnings based on severity of disability	15–70 % of average earnings based on severity of disability	65 % of average earnings for 100 % disability
	Medical care	After 2 years of disability, eligible for Medicare	Universal health care administered by provinces	Universal health care	Universal health care, co-payments required for some services	Free service with restricted network of providers
Sickness absence						
	Eligibility	No national program, may be provided by employer as part of benefits package	600 h covered employment in past year, sickness certified by a doctor	All workers	All workers	Must have 74 h employment in past 8 weeks
	Party responsible for benefit	–	Federal government	Employer or private insurer contracted with employer	Employer for first 6 weeks, then federal government	Employer for first 2 weeks, then federal government
	% of wages replaced	–	55 % of average weekly earnings	70 % wages	100 % of salary for first 6 weeks, then 70 % of salary	Up to $695 (US) per week
	Maximum duration	–	15 weeks	104 weeks, may be extended for additional 52 weeks	84 weeks	52 weeks
Work injury						
	Eligibility	Injury occurred during work activity	Injury occurred during work activity	Covered under sickness absence plan	Injury occurred during work activity	Injury occurred during work activity

	% of wages replaced	Varies by state, usually about 66 %	75–90 % of earnings	Same as sickness absence program	66–100 % depending on length of disability	Up to $695 (US) depending on hourly wage
	Temporary benefits	3–7 day waiting period, lasts up to 6 weeks	No waiting period, duration varies by province	Same as sickness absence program	100 % wages for first 6 weeks paid by employer, then 80 % paid by government for up to 78 weeks	No waiting period, paid for up to 52 weeks
	Permanent benefits	Usually 66 % of wages, length of benefit determined by severity of injury	75–90 % of earnings for total disability, lower percentage for partial disability	Same as sickness absence program	66 % prior earnings for total disability, lower percentage for partial disability that exceeds 20 % impairment	80 % prior earnings for total disability, lower percentage for disability greater than 50 %, lump sum payment for 15–50 % disability
	Medical care	Any necessary for injury	Universal health care	Universal health care	Universal health care	Unrestricted access to health care
Unemployment						
	Eligibility	Registered, actively seeking work	420–700 employed hours in past year, able and willing to work or unable to work due to illness	Loss of at least 5 h employment per week with loss of income Registered and able to work	12 months covered work in last 2 years, registered and actively seeking work	Member of unemployment fund, 52 weeks of employment in last 3 years, registered and able to work
	Waiting period	7 days	14 days	None	None	None
	% of wages replaced	50 %	55 %	75 % for first 3 months, then 70 %	67 %	90 % up to $695 (US) per week
	Duration of benefit	26 weeks	14–45 weeks	One month per year of work	6–24 months	208 weeks

Social Security Administration 2010b, c; Bloch and Prins 2001 outcome in other clinical populations as well. In many cases, the focus of return to work measures differs somewhat in different populations. This section will examine the different return to work measures commonly used in various clinical populations and what factors influence return to work in those patients.

11.4.1 Brain Injury: Stroke and Traumatic Brain Injury

Because cognitive and motor deficits are common among survivors of stroke and traumatic brain injury, outcome researchers in these disorders often focus on *return to productivity* rather than *return to work*. There is also an important distinction between *competitive employment* and *supported employment*. Supported employment programs use vocational specialists to find paid employment for persons with disabilities. The vocational specialists provide ongoing support and long-term follow-up to help with job training or accommodations as needed to maintain employment for persons with disabilities (Wehman et al. 2003). In many European countries, a certain percentage of jobs can be set aside for people with disabilities, which also constitutes supported employment. Competitive employment refers to jobs obtained and maintained on the open market. One study defined competitive employment as a full or part time job that paid minimum wage or more (Cifu et al. 1997). Several studies of return to productivity use the following outcome categories: competitive employment, supported employment, unemployed, student, retired, homemaker, and volunteer (Kreutzer et al. 2003; Walker et al. 2006). Other researchers use the more basic return to work measures such as: return to previous employment, return to previous employment with modifications (shorter hours, lower demands, working from home), return to different employment, or not returned to work (Benedictus et al. 2010; Ruffolo et al. 1999; van der Naalt et al. 1999).

An overall average of about 40 % of people with traumatic brain injury or stroke return to work, although that number can vary widely, from as few as 20 % with severe stroke (Hofgren et al. 2009) to as many as 73 % with mild head injury (van der Naalt et al. 1999). In traumatic brain injury and stroke, the best predictor of return to work is severity of injury and extensiveness of cognitive impairment (Benedictus et al. 2010; Cifu et al. 1997; Green et al. 2008; Hofgren et al. 2009; Kreutzer et al. 2003; Mattson et al. 1999; Muller et al. 2011; Ruffolo et al. 1999; Saeki and Hachisuka 2004; Tanaka et al. 2011; van der Naalt et al. 1999; Walker et al. 2006). In stroke survivors, spatial neglect syndrome and aphasia are particularly strong predictors of failure to return to work (Hofgren et al. 2009; Muller et al. 2011; Saeki and Hachisuka 2004; Tanaka et al. 2011).

11.4.2 Coronary Artery Disease and Myocardial Infarction

Return to work is a frequently studied outcome in cardiac patients. Because cardiac patients usually do not suffer cognitive or motor deficits as a result of their disease process, those of working age can reasonably be expected to return to work after treatment. Most studies of return to work in cardiac patients examine typical return to work outcomes: work status (working/not working), full time or part time work, and time taken to return to work (Abramson et al. 2002; Bradshaw et al. 2005; Farkaš et al. 2008; Fukuoka et al. 2009; Khanna et al. 2004; Söderman et al. 2003). One study distinguished between people who were not working due to cardiac symptoms, such as chest pain, and those who were not working but had no cardiac symptoms (Noyez et al. 1999). Approximately 50–80 % of myocardial infarction patients return to work (Abramson et al. 2002; Bradshaw et al. 2005; Farkaš et al. 2008; Fukuoka et al. 2009; Khanna et al. 2004; Noyez et al. 1999; Söderman et al. 2003).

In many studies of cardiac patients, psychosocial factors are better predictors of return to work than are physical factors, such as the severity of symptoms. A common predictor of return to work in cardiac patients is work status prior to cardiac event: those who had poor employment histories prior to treatment were less likely to return to work after treatment (Bradshaw et al. 2005; Hammermeister et al. 1979; Noyez et al. 1999). In addition, several studies have identified depression and anxiety symptoms as predictors of failure to return to work after treatment for myocardial infarction (Abramson et al. 2002; Cay et al. 1973; Fukuoka et al. 2009; Stewart and Gregor 1984; MÆland and Havik 1987; Nagle et al. 1971; Söderman et al. 2003). In fact, a study by Cay et al. (1973) found that the influence of depression and anxiety on work status was greater for patients with chest pain but no actual myocardial infarction. Other factors that predicted failure to return to work included older age (Abramson et al. 2002; Isaaz et al. 2010; Khanna et al. 2004) and lower socioeconomic status (Bradshaw et al. 2005; Hammermeister et al. 1979; Isaaz et al. 2010; Stewart and Gregor 1984).

11.4.3 Other Medical Conditions

Return to work has been examined in a variety of other medical conditions, such as burns, cancer, organ transplants, and spinal cord injury. Most of these studies measure employment characteristics such as work status, full time or part time work, similar or different types of work, and time to return to work. In most of these medical conditions, severity of disease is directly related to the likelihood of returning to work. For example, in burn victims, successful return to work is best predicted by a smaller percentage of total body surface area burned and smaller areas of full thickness burns (Quinn et al. 2010; Öster and Ekselius 2011; Tanttula et al. 1997). In cancer survivors, those with advanced stage cancer were less likely to return to work (Bouknight et al. 2006; Ross et al. 2012; Verdonck-de Leeuw et al. 2010). A study of head and neck cancer survivors found that those with oral dysfunction were particularly likely to fail to return to work; in fact, none of the patients who were dependent on enteral nutrition (tube feeding) were successful in returning to work (Verdonck-de Leeuw et al. 2010). Organ transplants, which carry a much higher mortality rate than many other conditions, have correspondingly lower rates of return to work. At follow-up, only 22 % of liver transplant patients and 24 % of lung transplant patients were employed (Delva et al. 2009; Moyzes et al. 2001). In spinal cord injury patients, those with better motor function and independence in transportation were more likely to return to work (Hess et al. 2000; Jang et al. 2005).

11.4.4 Psychiatric Disorders

Measures of return to work in mental health consumers vary depending on the condition under study. Less severe conditions, such as mild depression or anxiety, often consider reductions in productivity, or *presenteeism*. Lagerveld et al. (2010) made a distinction between *work participation* and *work functioning*. Work participation refers to the capacity to participate in the workforce, and includes work status, sickness absence, absenteeism, receipt of disability benefits, and termination of employment. Work functioning refers to the productivity or performance of employees that participate in the workforce; work functioning includes work limitations, productivity, lost productive time, inefficiency and error rates. Both work participation and work functioning are influenced by the relationship between an individual's health and psychological resources, as well as by the expectations and demands of the workplace (Lagerveld et al. 2010). Kessler et al. (2006) calculated lost work days in consumers with mood disorders by comparing absentee rates with presentee rates. Degree of lost productivity (presenteeism) was rated on a scale of 0 (no work completed while at work) and 100 (performing at the level of a top worker), and then was compared with the percentage of scheduled work days that were missed (absenteeism). The study found that both major depressive disorder and bipolar disorder were associated with losses in productive work days as well as with days absent from work. Additionally, degree of absenteeism may be considered. Chatterji et al. (2007) used the outcome categories of work status (current employment), weeks employed in the past year, and days of work missed in the past month. Finally, some researchers use a more global measure of work impairment. The Longitudinal Interval Follow-up Evaluation (Keller et al. 1987) includes a 5-point scale of work and school functioning, with endpoints of "no impairment and functioned at a high level" and "did not attend work or school due to psychopathology."

Consumers with severe mental illness, such as schizophrenia, often focus on supported versus competitive employment. For example, studies of consumers with schizophrenia often define return to work as formal paid employment, but distinguish non-competitive (supported) employment from competitive employment (Gold et al. 2006; McGurk and Mueser 2004; Young et al. 2011). Gold et al. (2006) defined competitive employment as a job with wages at or above minimum wage that was available to people with and without disability, where the employer did not set aside jobs for people with disabilities, and where the consumers themselves contracted for the job (i.e., the job was not arranged for them by a mental health worker). In addition, number of hours worked and wages earned are often tracked for competitive and supported employment (Gold et al. 2006; McGurk and Mueser 2004). Another study rated employment status in schizophrenia on the following scale: complete financial dependence, desire to work, attempted to work but failed, attempted to work and succeeded, and obtained satisfactory employment (Srivastava et al. 2009).

In mental health consumers, return to work is often related to the severity of the condition. For example, consumers with cognitive impairments and poor social functioning are less likely to return to any type of employment (Burns et al. 2009; Gold et al. 2006; McGurk and Mueser 2004; Srivastava et al. 2009). Similarly, severity of symptoms is predictive of work status in obsessive-compulsive disorder (Mancebo et al. 2008), major depressive disorder (Lagerveld et al. 2010; Salminen et al. 2002), and eating disorders (Bardone-Cone et al. 2010). Extended or repeated episodes of psychiatric disorders were also predictive of failure to return to work (Blank et al. 2008; Brouwers et al. 2009; Cornelius et al. 2011; Koopmans et al. 2011; Lagerveld et al. 2010; Salminen et al. 2002). Finally, mental health consumers with comorbid physical or mental disorders or problems with substance abuse were less likely to return to work (Blank et al. 2008; Cornelius et al. 2011; Lagerveld et al. 2010; Mancebo et al. 2008).

Rates of return to work in mental health consumers vary widely, depending on the type of disorder. In consumers with mild depression and anxiety, about 80–85 % will return to work (Mintz et al. 1992; Simon et al. 2000; Wells et al. 2000). However, only half of those with obsessive-compulsive disorder and 30–40 % of those with schizophrenia successfully return to work (Burns et al. 2009; Gold et al. 2006; Mancebo et al. 2008; McGurk and Mueser 2004; Srivastava et al. 2009). Several programs have shown some success in assisting consumers with severe mental illness to return to work. Assertive community treatment, cognitive remediation, and individual support and placement programs have all improved the number of consumers with severe mental illness that return to work (Gold et al. 2006; McGurk and Mueser 2004; Nuechterlein 2010). Assertive community treatment also increased the number of consumers in competitive employment; these consumers worked more hours and earned more income than those in a supported employment program (Gold et al. 2006). Table 11.4 summarizes the various return to work measures used in clinical populations other than musculoskeletal injury; Table 11.5 shows the best predictors of return to work for other clinical populations.

In conclusion, return to work is an important outcome in many physical and mental conditions. However, the best way of measuring return to work depends on the clinical population being considered. For conditions with mild physical or mental impairment, such as heart attack or mild depression, measures of presenteeism and employment status may be appropriate, while for those with severe physical and/or mental impairment, such as stroke or

Table 11.4 Measurement of return to work in other clinical populations

Population	Measure	Description
Brain injury		
	Competitive employment	Work situations are arranged by the employee and are not reserved for people with disabilities Pays minimum wage or more
	Supported employment	Work situation is arranged by a social service or rehabilitation worker; jobs may be set aside for people with disability
	Productivity	Competitive employment, supported employment, unemployed, student, retired, homemaker, and volunteer
	Return to work	Return to previous employment Return to prior employment with modifications Return to different employment Not working
Coronary artery disease		
	Work status	Working/not working Full time/part time Time to return to work
Other medical conditions		
	Work status	Working/not working Full time/part time Same work/different type of work Time to return to work
Minor or mild psychiatric conditions		
	Work participation	Work status Sickness absence Absenteeism Disability benefits Termination of employment
	Work functioning	Work limitations Productivity Lost productive time Inefficiency Error rates
	Presenteeism	Degree of lost productivity Percentage of scheduled days worked
	Absenteeism	Current employment Weeks employed in the past year Days of work missed the past month
	Work impairment	No impairment and functions at high level
Severe mental illness		
	Supported employment	Work situation is arranged by a social service worker, jobs may be set aside for people with disability
	Competitive employment	Wages at or above minimum wage Job contracted by consumer Hours worked Wages earned

Table 11.5 Predictors of return to work in clinical populations

Population	Predictors
Brain injury	Severity of injury Cognitive impairment Unilateral neglect syndrome Language impairment
Coronary artery disease	Employment history Depression and anxiety symptoms Socioeconomic status Older age Job strain or stress
Other medical conditions	Severity of condition
Minor or mild psychiatric conditions	Severity of symptoms Extended or repeated work absence Comorbid physical conditions Comorbid substance abuse
Severe mental illness	Cognitive impairment Poor social functioning Extended or repeated work absence Comorbid physical conditions Comorbid substance abuse

schizophrenia, productivity and independence in daily activities may better reflect the degree of recovery attained.

11.5 Conclusions

In this chapter, we have reviewed ways in which the behavioral outcomes of health interventions for work related injuries and resultant incapacity may be evaluated and defined. Ultimately, these outcomes are reflected in work return and work retention. There are a variety of perspectives from which to regard these outcomes. A biopsychosocial perspective allows a better understanding of how differences in entitlements, access to legal representation, economic conditions, and the specific disease and condition being treated or managed will all have an impact on work return and retention. Above all, it is important that health professionals working within this field accept the need to continue to define and document behavioral outcomes in their attempts to return injured or medically ill workers back to employability and functionality.

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Risk Identification and Prediction of Return to Work in Musculoskeletal Disorders

12

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12.1 Background

A 41-year-old male long-haul truck driver has experienced low back pain for the past 2 weeks. He tells his physician that the pain started at work shortly after lifting a large freight container off a trailer. At the time, he felt a "pop" in his back but the pain was not too bad. But the pain has worsened to the point where he does not think he can continue his work duties. His pain is localized to the lumbar spine, does not radiate, and yet has not subsided. He has not worked for the past 2 days while waiting for the medical appointment and has filed a workers' compensation claim. He reports that his job requires long periods of driving and occasional heavy materials handling when loading and unloading freight. He has worked at this job for the past 20 years and has had three previous low back pain episodes. Each of these resolved within a month, but each episode has been progressively worse. He states the current episode is by far the worst, and he does not think he will be able to return to work (RTW) any time in the near future if the pain does not start getting better. He rates the pain at 8 on a 10-point numeric pain rating scale. Physical examination reveals limited trunk mobility but normal neurological functioning. After the exam, the patient tells the physician: "I've had back pain before, but never like this. I'm really worried about this pain because I've got bills to pay and I really need to get back to work. When do you think I'll be ready to go to work, doc?"

The question posed is one of the most sought-after pieces of information from healthcare providers in cases of work-related back pain and other musculoskeletal conditions resulting in work absence. The answer provided by the healthcare provider has enormous implications for the worker in terms of what they believe about their condition and likelihood of RTW. The answer also has major implications for his employer who may need to hire a replacement worker in the interim and the insurance carrier who wants the patient to achieve optimal recovery and RTW quickly to minimize costs. Yet the answer is elusive and few healthcare providers are confident in making such predictions. This chapter will discuss why prediction of RTW is important, summarize some of the important factors in prediction, and discuss some of the predictive indices developed to assist healthcare providers in this difficult task.

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As the case scenario demonstrates, predictions about likelihood and time to RTW are important for workers, employers, and insurance carriers. Predictions also have consequences for workers' families, unions at the workplace, healthcare providers, and other stakeholders involved in the case. However, predictions are not always straightforward. While the majority of workers with work-related musculoskeletal conditions RTW quickly, a minority remains off work for prolonged periods of time (AMA 2011). At times, this is due to the nature of the diagnosis, as injuries such as fracture, dislocation, or amputation often take longer to heal than soft tissue or regional pain disorders. However, when individuals with similar conditions are observed, variability in recovery rates are seen. One worker with acute low back pain may RTW within a matter of days, while another with similar clinical signs and symptoms may be off work for months or years. Those with prolonged work absence are responsible for the majority of costs and associated societal burden for employers, families, and other stakeholders. If workers at risk of prolonged work absence could be identified early in the course of their condition, they could be targeted for aggressive occupational or vocational rehabilitation (Shaw et al. 2009; Turner et al. 2008). As such, identifying workers at risk of prolonged absence is a key objective for clinicians and researchers (Linton et al. 2005).

Unfortunately, RTW is a challenging outcome to predict. RTW is a complex social phenomenon influenced not only by the nature of the health condition but also by social, workplace, and cultural factors, among others (Young et al. 2005). RTW is also a complicated outcome to define and measure (Wasiak et al. 2007). Are we referring to full return to the usual job or RTW with modified duties? Also, there may be ongoing problems with presenteeism and increased burden placed on coworkers due to a patient's ongoing work disability despite RTW (Wasiak et al. 2007). RTW is also only relevant when there is a job to go back to and may not even apply to workers who have been terminated from their usual position. These issues will be discussed in depth in other chapters, but we mention them here to highlight some of the difficulties faced when predicting RTW.

12.2 Big Picture: Why Do We Care About Risk Identification and Prediction?

Being able to accurately identify those at high risk of work disability is important for many reasons. From the patients' perspective, having an accurate prediction of timelines for recovery can aid them by decreasing the fear and anxiety of uncertainty and can help them create a plan for themselves and their families. Knowing their likely course of recovery can also assist them in making treatment and self-care decisions. From the healthcare provider's perspective, such information can be helpful in matching a course of treatment or management decisions to the patients' needs. For example, early and more intense intervention programs might be directed specifically toward those at risk of work disability. Experience has long ago demonstrated that an early intervention approach directed at all injured workers, regardless of whether they are at high or low risk of transitioning to work disability, is costly and ineffective (Sinclair et al. 1997). A more focused approach to prevention of disability has a greater likelihood of being both more effective and economically practical.

The potential benefits of early intervention have been demonstrated by Gatchel and colleagues who conducted studies on risk prediction and targeted early intervention in patients with acute low back pain (Gatchel et al. 2003; Whitfill et al. 2010). Initially, a statistical algorithm aimed at prediction of recovery and return to work was developed (Gatchel et al. 1995a, b). Next, the algorithm was used to stratify patients as either high risk for disability or low risk. On the basis of this screening, high-risk patients were treated with early intervention using functional restoration. The authors found in two separate studies that this approach leads to better clinical and RTW outcomes than standard care. High-risk patients receiving early intervention displayed lower pain and disability as well as reduced healthcare utilization and medication use, which resulted in substantial cost savings (Gatchel et al. 2003). Clearly, targeted interventions based on risk prediction have the potential to greatly augment the care of injured workers.

Accurate prediction is also of benefit to employers, who can better adjust personnel and workloads to accommodate an injured employee's anticipated delayed RTW. It can also assist in guiding the employer's interactions with the injured worker. On a broader level, being able to accurately predict delays in RTW would be helpful to workers' compensation systems in administrative decisions having to do with that claimant and in doing overall program planning. For the healthcare system at large, such knowledge could be useful in developing and implementing more effective health policy and lead to more accurate budgets and effective economic planning.

12.3 Distinguishing Prediction and Causation

It is important to distinguish the identification of those factors that *predict* whether an injured worker is likely to become work disabled from those factors that are *causes* or *determinants* of that outcome. Both are crucially important, but for different reasons. As above, *prediction* helps us to identify those likely to have a difficult transition to RTW or, worse still, become completely work disabled. When the goal is to *predict* work disability, it makes little difference whether the predictors are modifiable (such as an ergonomic factor or attitude) or non-modifiable (such as age or gender). The important issue is to be able to identify those factors that distinguish those likely to become disabled. However, a characteristic that *predicts* an outcome such as disability is not necessarily a *cause* or *determinant* of that outcome. To take a concrete example, we can predict that those people with tobacco-stained fingers are at higher risk of developing lung cancer than those without such stains on their fingers. However, we would never consider finger staining to be a cause of lung cancer—it is simply a marker. Modifying that predictor (e.g., subjecting that individual to some process that removes the stain) will not change their risk of lung cancer. Only changes to the underlying determinant—heavy smoking—will have the desired effect. Similarly, factors that can be used effectively to predict work disability may not be causal factors in themselves and thus may not be useful targets for intervention programs. On the other hand, identifying *determinants* of work disability that are modifiable can help to identify potentially useful intervention targets.

12.3.1 Taking a Broad-Based Perspective

Whether we are trying to identify predictors or causes, taking a broad perspective and considering more than medical, physiological, and injury-related issues is important. Adopting a broad-based biopsychosocial view of health, disease, and disability allows for (1) considering the essential but often complex interrelationships among the individual's physical and medical status, (2) his or her psychological makeup, beliefs and attitudes, and psychological reactions to the injury, (3) that person's interpersonal relationships and interactions (e.g., social support network and relationships with workmates and supervisor), and (4) the overall physical, social, and societal environment in which that person lives and works (Borrell-Carrio et al. 2004; Engel 1977). The biopsychosocial view is the fundamental basis for the WHO's Classification of Functioning, Disability and Health (WHO ICF model) (WHO 2011). This widely accepted framework for understanding injury impairment and disability was endorsed by the WHO member nations in 2001; it considers both the individual and contextual factors that determine health and the consequences of injuries. This model calls for examining disability risk factors through an integration of biological and medical perspectives with psychological, social, and environmental aspects in considering both the causes and consequences of disability. In the case of work disability, this model calls for an exploration, understanding, and synthesis of not only personal (physical and psychological) factors, but also interpersonal, occupational, and societal factors in identifying both predictors and causal factors.

12.3.2 A Broad-Based Perspective of Prevention

The WHO ICF model of function and disability has also converged with more recent public health perspectives on disability prevention, which promote exploration of a broad range of potential risk factors. The traditional view classified *prevention* into three categories: (1) primary prevention, which in this context would involve prevention of the injurious event in the first place; (2) secondary prevention, which would involve early intervention to promote recovery and prevent the development of work disability after an injury; and (3) tertiary prevention, which would involve efforts to minimize the negative impact of disability and promote rehabilitation to return the disabled worker back to work wherever possible.

With the more recent emphasis on a broader view of health and disability, prevention theory has evolved and prevention practices and strategies have been redefined and reclassified (Gordon 1987). The thrust with this redefinition is to specify the type of target for the intervention and to identify a wider range of factors requiring intervention. The first category, *universal prevention*, involves prevention strategies and interventions directed at a whole population, which can be the general public or a specified population (e.g., the population of workers in general or all the workers in a particular field, such as all those who work on oil derricks). This approach can be useful where everyone in that population is at risk and involves raising awareness within that population about the risks involved. Examples of such approaches include government regulations, infomercials, workplace intervention to everyone in the workplace, and media campaigns. This approach assumes everyone in the population has at least some level of risk and aims to shape attitudes and behavior. An example of a successful universal prevention approach for decreasing back pain disability is the series of media campaigns that took place in Australia and Canada, aimed at changing the general public's attitudes and beliefs about back pain (Buchbinder et al. 2001; Gross et al. 2010).

Universal prevention approaches are not necessarily effective with selected populations, however. For example, smoking prevention programs aimed at the general population have been more effective with adults than with youth. Thus, *selective prevention* is the category of prevention endeavors, which is targeted to individuals who demonstrate risk factors associated with a particular disorder. At the broadest level, selective prevention efforts aimed at disability prevention may be targeted to those persons in the workplace who have sustained a recent injury, since they are obviously at greater risk of disability than those in the workplace who have not sustained such injuries. To improve the ability to focus selective prevention efforts, the more that is known about risk factors, the more directed these efforts can become. Thus, we need to not only understand what the risk factors are; we also need to know whether they are causal or simply markers of causal factors. If causal, we need to know *whether* they can be addressed (i.e., whether the risk factor is modifiable vs. non-modifiable), *how* they can be modified (and how successful we are at doing so), and whether modifying those risk factors actually prevents disability. The third category of prevention is *indicated prevention*—prevention efforts targeted to individuals who have a clinical disorder (in this case, individuals who have transitioned to work disability). This category might include medical or rehabilitative intervention, but also includes a consideration of what nonphysical behaviors/attitudes or social/environmental factors need to be addressed, in what way they are most effectively addressed, and whether addressing them reduces the disability.

12.3.3 Prediction Studies: What Should We Look For?

Given the broad view of prevention described above, our focus shifts depending on our goals. Most studies investigating the transition from acute injury to disability address the question of *prediction* with the goal of identifying those factors that—on average—distinguish that group of injured individuals who become work disabled from those who do not, along with usual timelines for recovery. Such studies can be of some help in answering the question posed by the patient at the beginning of this chapter, "When will I be ready to go back to work…?" To the extent that there is good information available on average timelines, the injured worker's clinician can provide a rough estimate. By taking into consideration those factors that have been demonstrated to predict (on average) delayed RTW, the accuracy of this estimate might be improved. In the example provided, this particular patient has several factors that have been identified as predicting delayed RTW, including poor expectations for recovery, prior history of back pain, high pain intensity, a job with heavy demands, and a compensation claim. However, to provide an answer that takes into consideration this injured worker's particular combination of risk factors, a validated clinical prediction rule would provide more precise information. Clinical prediction rules are designed to apply at the individual patient level and are intended to be used to make patient management decisions, such as screening, triage to RTW programs, and other clinical decisions. Clinical prediction rules focus on those predictors that are readily available in a clinical setting (through clinical exam/laboratory tests and/or information available from the patient), need to be validated on datasets other than the one(s) they were developed on, and also need to be both clinically useful and accurate (Altman 2009). That is, clinical prediction rules should aid in making clinically relevant patient management decisions, and they should be accurate in their prognostications, with high sensitivity and specificity so they can be used to correctly identify those who will and those who will not have difficulty returning to work. Since the goal here is to identify predictors instead of causal factors, a good clinical prediction rule will identify *who* to target for interventions, but may not identify *what* individual or environmental factors should be addressed in that intervention. Moreover, as we outline in a subsequent section in this chapter, the measures currently available for predicting RTW may be less accurate than we need for good prognostication and clinical triage.

12.3.4 Explanatory Studies: What Should We Look For?

To make effective decisions about *what* individual or environmental factors to intervene on in disability prevention, both theory and strong empirical evidence from explanatory studies is required regarding *determinants* of failure to RTW. In this, the existing literature has important gaps. There have been many factors identified in studies, but these studies often yield contradictory findings. To be clinically useful, we need to rely on factors that have been consistently found to be determinants of work disability/RTW in multiple studies and that have a meaningful (clinically important) association with outcomes. One useful framework for understanding explanatory prognostic studies suggests that there are three phases of explanatory prognostic research (Hayden et al. 2008). The first phase of this type of research as it relates to RTW is to simply identify prognostic associations between a number of potentially explanatory factors and RTW, usually using a multivariable analysis. This type of study is hypothesis generating in that it identifies candidate variables which may be determinants of RTW, but spurious associations are common, genuine effects are often missed, and associations may be present in one population but not in another. The next phase in the process of understanding determinants of RTW would be a phase II study. In this phase of research, candidate determinants are subject to confirmation of their role in the outcome. Such studies will test the independent association between the potential determinant and RTW while explicitly controlling for as many relevant confounders as possible. Thus, this type of study is considered confirmatory. However, even when a factor has been demonstrated to be an independent (i.e., unconfounded) determinant of the outcome, it is still likely that the relationships among determinants and RTW are not direct and isolated, but are actually more complex than this. It is by understanding those complex pathways—that is, how determinants affect each other, whether and how their impact on RTW changes over time, what factors mediate or moderate the role played by these determinants, and so on—that we can understand why some people RTW and others do not. Thus, the third and final phase of conducting explanatory prognostic research is the development and testing of models that describe these complex pathways.

12.4 Important Factors in Predicting Return to Work

As mentioned, several exploratory prognostic studies have been conducted on the issue of RTW following musculoskeletal disorders. The majority of these studies have been conducted on workers with low back pain (Hayden et al. 2010), but some research has focused on other regional pain conditions as well as more specific injuries such as amputation and fracture (Hepp et al. 2011; Matsuzaki et al. 2009). Very few phase II or III prognostic studies have been conducted examining RTW; however, some systematic reviews have attempted to identify important factors consistently associated with prolonged work absence. Individual predictors consistently identified will be discussed below.

When examining individual predictors, clearly RTW is a multifactorial phenomenon. Typically, important predictors come from a variety of domains including personal [i.e., age and sex (Brede et al. 2012)], psychological [recovery expectations (Cole et al. 2002; Heijbel et al. 2006; Gross and Battié 2010; Schultz et al. 2002; 2005), catastrophizing (Sullivan et al. 1998), fear of movement (Wideman and Sullivan 2011) and perceptions of injustice (Franche et al. 2009; Sullivan et al. 2008)], condition or injury-specific factors [i.e., injury severity (Brenneman et al. 1997)], level of reported pain or disability (Bartleson 2002), pain behavior such as guarding (Prkachin et al. 2007)], social factors [low income (Fan et al. 2010) and social dysfunction (Steenstra et al. 2005)] or workplace factors [type of job (Fan et al. 2010), heavier physical demands (Steenstra et al. 2005), and availability of modified duties (Feuerstein et al. 2003)]. Some of the important predictors categorized according to domain are outlined in Table 12.1. As can be seen from the table, while the list is far from exhaustive, a wide range of factors are potentially important. Authors of a recent systematic review comparing risk factors predicting RTW between

Table 12.1 Non-exhaustive list of factors identified as predictive of return to work in exploratory prognostic studies

Factor type	Examples
Personal	Age, sex, ethnicity/nationality, recovery expectations, number of previous work loss episodes
Condition specific	Duration of the problem, injury severity (i.e., nerve root involvement versus others, fracture or nerve lesion versus sprain/strain), pain intensity, levels of reported disability
Psychological	Coping ability, depression, fear avoidance, anxiety, catastrophizing, cognitions, and emotions
Workplace	Availability of a job to return to, availability of modified duties, physical demands, job satisfaction, work process factors (i.e., decision latitude, schedule flexibility, etc.)
Social	Perceptions of workplace support, interpersonal relationships and interactions, supervisor ratings
System	Availability of workers' compensation, level of wage replacement benefits, availability of healthcare, type of healthcare received, attorney involvement

Table 12.2 Factors identified as predicting delayed return to work from previous systematic reviews (moderate or strong evidence)

Condition: acute low back pain (LBP) (Steenstra et al. 2011)			
Personal factors	*Condition factors*	*Workplace factors*	*System factors*
Recovery expectations Prior history or claim	Radiating pain (severity) Higher disability level Pain intensity Sought specialist care Pain behaviors observed	Heavier physical demands Available modified duties Job satisfaction Workplace psychosocial	Compensation benefits Attorney involvement Perceived fair treatment
Condition: non-chronic nonspecific LBP (Iles et al. 2008)			
Predictive psychosocial factors	*Factors not predictive*		
Recovery expectations Fear-avoidance beliefs	Job satisfaction Depression Stress/psychological strain Anxiety		
Condition: any condition (including LBP) with >6 weeks of work loss (Dekkers-Sanchez et al. 2008)			
Personal factors	*Condition factors*	*Social factors*	*Workplace factors*
Older age Recovery expectations	Higher disability level Pain intensity Poor general health (SF-36) Mental health disorders Duration of sick leave >1 year assessed as in need of comprehensive rehabilitation	Low income Not being the main wage earner	Unemployed History of work absence Lower job satisfaction Lack of skill discretion Nonprofit organization Perception of not being welcomed back to work (overlaps as a social and workplace factor)

workers with subacute and chronic back pain reported that over 100 individual factors were important in both subacute and chronic back pain (Heitz et al. 2009). Which of these factors are most important or useful in individual patients remains to be determined.

Unfortunately, factors identified as statistically significant in one study have not always been found important in other studies. In fact, results have even varied across systematic reviews examining similar conditions and outcomes. As seen in Table 12.2, systematic reviews of factors predicting RTW in acute low back pain have identified some key factors that are consistently predictive (recovery expectations, higher pain and disability levels) (Dekkers-Sanchez et al. 2008; Iles et al. 2008; Steenstra et al. 2011). However, other factors are not consistent across studies (job satisfaction and depression). This may be due to differing methods used in the studies (Hayden et al. 2009) but may also be due to the difficulties inherent to predicting the social and multifactorial phenomenon of RTW. For this reason, prognosis researchers have shifted away from studying individual factors toward predictive indices and the development of tools that may shed more light on the question of whether an individual patient is likely to RTW.

12.4.1 Predictive Indices and Tools

Several predictive indices or tools have been developed to help identify individuals at risk for delayed RTW, most of them pertaining to workers with low back pain (Melloh et al. 2009). Terminology in this area is not consistent, and tools have been given various names including predictive/prediction/prognosis/screening indices, tools, models, rules, instruments, or questionnaires, among other titles. Most of these are self-report questionnaires or combinations of variables that have been found to be significantly associated with RTW in multivariable regression models (Schultz et al. 2005). Questionnaire responses are tallied and an overall score obtained that is indicative of likelihood of RTW.

As previously discussed, Gatchel and colleagues have developed a risk prediction algorithm that has been found to both predict RTW and lead to improved clinical outcomes of patients with back pain when combined with early intervention (Gatchel et al. 1995, 2003). The algorithm is formed largely of psychological variables, including factors “low positive temperament” and “workaholism” from the *Schedule for Nonadaptive and Adaptive Personality* questionnaire, reliance on an “avoidance” coping strategy according to the *Ways of Coping Questionnaire* (*Revised)*, and the presence of an Axis I disorder and Axis II pathology (Pulliam et al. 2001). Another prediction tool that has been tested in a pilot early intervention trial is the *Risk for Disability Questionnaire* (Schultz et al. 2008). This tool has been created in a staged approach through testing in prospective cohort studies of injured workers with low back pain (Schultz et al. 2002, 2004, 2008). Screening and approaches to early intervention for injured workers will be discussed in another chapter in this text. For purposes of highlighting some of the uses and potential difficulties when using predictive indices, we will discuss three other promising and commonly used tools.

12.4.1.1 Örebro Musculoskeletal Pain Screening Questionnaire

The *Örebro Musculoskeletal Pain Screening Questionnaire* (ÖMPQ) (Linton and Boersma 2003) is a commonly used tool that is touted as a general musculoskeletal screening tool. It was modified from the *Acute Low Back Pain Screening Questionnaire* and consists of 25 items, 21 of which are scored on a scale from 2 to 210. A 10-item short-form ÖMPQ has been described that appears to predict as well as the full version (Linton et al. 2011). The tool consists of items related to pain, work-related and psychosocial factors, and general function. It has been shown to have acceptable reliability (test-retest r = 0.83) (Linton and Hallden 1998). In addition, measures of prognostic accuracy suggest the ÖMPQ is a useful tool for predicting future pain, disability, and RTW (Dunstan et al. 2005; Hockings et al. 2008). Although a general musculoskeletal questionnaire, it has been primarily studied in back pain. Research has provided estimates of cut scores to determine high risk in various populations and range from 90 to 120 (with scores above suggesting elevated risk and further assessment required). The ÖMPQ provides an index of suspicion for future functional limitations but it is not meant to be diagnostic. The developers advocate for detailed follow-up assessment if the score suggests increased risk.

Authors of a review related to the ÖMPQ have questioned the use of cut scores and instead advocate for continuous measures of risk (e.g., 80 % chance of unsuccessful RTW) (Sattelmayer et al. 2011). Recently, the ÖMPQ modifications to the scale have been recommended suggesting a revised version may have improved psychometric properties (Gabel et al. 2011). Taken together, the ÖMPQ appears to be a useful tool to be used in conjunction with other factors known to predict RTW. While the ÖMPQ has been applied to other conditions (Dunstan et al. 2005; Gabel et al. 2008; Margison and French 2007; Westman et al. 2008), the validity evidence suggests it is best applied in the context of back pain. Although the ÖMPQ has been used to predict RTW, the majority of the studies have used future pain and disability as the predicted outcome (Sattelmayer et al. 2011).

12.4.1.2 Cassandra Prediction Rule

The *Cassandra* prediction rule was derived from an analysis of items from the Symptom Checklist-90 revised in a large sample of individuals with back pain (Dionne et al. 2005). This analysis revealed 17 items related to psychological distress (depression and somatization) were the strongest predictors of functional limitations 2 years post-injury as measured by the *Roland-Morris Disability Questionnaire*. In a follow-up validation study, the rule’s sensitivity was reported as 86 %, while specificity was just 57 %

(Dionne 2005). This 17-item rule was reexamined to determine if it could be improved by adding items from the *Psychological Symptoms Index* and *Brief Symptom Inventory*. The researchers also examined if the revised rule could be shortened and perform better than clinician predictions. This most recent study has suggested the original 17-item rule could be reduced to a 5-item rule consisting of items related to psychological distress (*Cassandra II*) (Dionne 2005). The five-item rule performed similarly to the original 17-item rule and was superior to clinician prediction.

Despite this tool's promise, it measures psychological factors only, and predictors of disability and RTW are not exclusively psychological. Thus, some workers with nonpsychological prognostic indicators and who do not have psychological distress would likely be misclassified using this tool. In addition, this tool has not been validated with the outcome RTW. Instead, the outcome investigated has consistently been functional limitation (disability).

12.4.1.3 STarT Back Screening Tool

The *STarT Back Screening Tool* is a 9-item tool used to identify patients with a poor prognosis for recovery from back pain (Hill et al. 2008). The first four items are termed physical indicators (referred pain, comorbid pain and disability) while the remaining five items are psychosocial in nature (fear, depression, anxiety, catastrophizing, bothersomeness). Items were selected based on their prognostic potential as well as ability to be modified. The scale has been found to be reliable (Cronbach's alpha = 0.79) and has been found to identify patients at high risk of delayed recovery as effectively as the ÖMPQ while being shorter and easy to score (Hill et al. 2008, 2010). In addition to making a prediction about future RTW, the tool also identifies interventions most likely needed for successful RTW. Thus, this tool goes beyond prediction into the realm of clinical triage and selection of appropriate treatment. Possible scores range from 0 to 9, and patients scoring less than 3 are classified as at low risk for persistent disability and are likely to recover without intervention. Those with scores greater than 4 but 3 or less on the psychosocial indicator items are classified as medium risk, and physiotherapy is recommended. Patients scoring 4 or greater on the psychosocial factors are classified as having high risk, and a psychologically-informed intervention is recommended.

The *STarT* Back Tool, coupled with interventions matched to risk category, was examined against usual care of back pain in a large randomized controlled study in the UK (Hill et al. 2011). While follow-up measures of pain and disability showed just modest improvements, cost-benefit savings were shown in the *STarT* back arm of the study. Another notable finding was that significantly less treatment occurred in the low risk *STarT* back group compared to the usual care group, with comparable outcomes between groups. Unfortunately, the *STarT Back Tool* has not been evaluated as a predictor of RTW, only for the prediction of disability.

The extent to which these tools correctly identify risk is referred to as prognostic accuracy. RTW prediction accuracy is primarily determined by: (1) the accuracy of a predicted estimate of RTW (calibration) and (2) the ability to separate workers into risk categories (discrimination) (Bartfay and Bartfay 2008). Numerous methods can be used to estimate prognostic accuracy including statistics such as risk (e.g., viewing risk on a continuum: i.e. 80 % chance of successful RTW), sensitivity (e.g., for those who do not RTW, the likelihood that the tool/test correctly indicates no RTW), and specificity (e.g., for those who do RTW, the likelihood that the tool/test indicates RTW), but it is critical that tools have been evaluated rigorously prior to widespread clinical use. Future research examining the ÖMPQ, *Cassandra II* scale, and the *STarT Back* Tools' role in decision-making specific to RTW is needed.

In addition to prognostic accuracy, it is important to determine whether the tool is valid in populations outside the study sample from where the prediction tool was derived (Riegelman 2005; Streiner and Norman 2008). For example, is a tool developed in the USA likely to yield the same results in Canada or the UK? Jurisdictional and cultural differences across regions are likely to lead to different levels of prognostic accuracy. Thus, a tool is only valid to the extent the population of interest resembles the study population for which the tool was derived.

12.4.2 How Should These Tools Be Used?

Many of the tools developed have shown acceptable levels of accuracy, but none can predict the future with complete certainty. Thus, users must accept a degree of uncertainty that leads to difficult questions. For example, what is a sufficient level of higher risk that will lead to changes in management approach or resource allocation? Is it better to identify all workers who are unlikely to RTW early at the expense of also falsely identifying some workers who are not at risk for poor outcome? If so, a probable consequence is elevated costs since some workers will be treated when they likely would have returned to work without intensive interventions. Since prediction of RTW is imperfect, users must weigh the consequences of making imperfect judgments based on these predictive tools.

Considering the imperfect prediction of RTW, it is important to have a clear understanding of how best to apply these tools. The tool developers should be consulted to obtain the most recent wording of the tools and scoring procedures. To enhance validity, no changes should be made to the scale items. Although tools such as the ÖMPQ and *Cassandra II scale* are not necessarily condition specific, the vast majority of research performed in this area has been performed on patients with back pain. Thus, these tools are likely best suited in the context of workers with back pain. Since prediction of RTW is complex and multifactorial, additional information should be gained through consultation with all stakeholders. In most cases, employers, other healthcare providers, case managers/adjudicators, and the worker all collaborate to make RTW decisions. In this context, prediction tools are best used adjunctively with other information gathered from the various stakeholders.

12.4.2.1 Cautions Regarding Use of Tools

Considering the high stakes involved in RTW, care should be taken in making decisions based on predictive tools alone. A number of cautions should be considered prior to using these tools in clinical practice. As described above, prediction is imperfect. Put another way, complex human behaviors (e.g., RTW) can be inherently unpredictable. Much of this unpredictability can be ascribed to social, political, and contextual factors that are not easily measured or incorporated into a tool. Thus, at best, these tools are likely best viewed as adjunctive information that increases the probability of an appropriate prediction, but they are likely not a singular solution. Furthermore, the accuracy and validity of these measures have been established in controlled studies, which necessitate a careful examination of how the study contexts mirror the setting of the potential user of the tool.

Predicting future pain or disability is not the same as predicting RTW. The outcomes pain and disability share some similarities with the outcome of RTW. For example, psychosocial factors are common predictors of both persistent disability and RTW. In a review of screening instruments, Melloh and colleagues reported that psychological factors are common predictors for outcomes such as RTW, function, and pain (2009). However, occupational factors were also important in RTW. At an individual level, we know some workers RTW despite ongoing pain and disability. On the other hand, some workers may not RTW even though they may have little observable disability. For example, a worker may have no identifiable structural-pathological impairment (e.g., is strong and flexible) or activity restrictions (e.g., meeting job demands), yet reports an inability to participate in work. In other words, the factors that determine RTW participation often differ from those that determine one’s ability to perform work tasks (function) (Lakke et al. 2009; Soer et al. 2008; WHO 2002).

Just as it is questionable to use a screening tool that has not been examined for its predictive accuracy specific to the outcome RTW, it is not appropriate to assume that measures developed for workers with back pain can be applied to other conditions. While prognostic factors for musculoskeletal pain share similarities across conditions, it cannot be assumed that tools derived and examined in one musculoskeletal condition will perform the same in others. Many of the predictors in Table 12.1 (personal, psychological, workplace, social, and system factors) may generalize across conditions; however, condition-specific factors will not (e.g., presence of radiculopathy). Even within a condition, risk factors are likely to vary depending on whether the condition is acute or chronic (Grotle et al. 2010). Again, many of the identified risk factors come from literature on back pain, and the extent these factors vary across conditions is not known.

As was seen in the discussion related to specific tools, few of the instruments have been thoroughly tested. While instruments such as the ÖMPQ, *Cassandra II* scale, and *STarT Back Tool* have shown encouraging results related to prognostic accuracy, validity evidence demonstrating consistent findings across jurisdictions and conditions and examining RTW-specific outcomes is lacking. Furthermore, even within the factors that have been consistently shown to be prognostic, the size of their effect remains low after adjusting for baseline disability (Grotle et al. 2010). Thus, more work is required to identify the most important and powerful predictors of RTW.

To illustrate these decision-making challenges, we have provided scores for the three screening tools based on the case of our truck driver with back pain described earlier. The hypothetical ÖMPQ score was 124/210, suggesting an increased risk for future disability. The *STarT Back Tool* score was in line with the ÖMPQ suggesting high risk for persistent disability (total score = 6/9; 4/5 on the psychological subscale). However, the *Cassandra II* scale was 0.60 since little psychological distress was reported, suggesting no increased risk. What scale is most appropriate? The *Cassandra II* scale consists of items primarily pertaining to psychological distress. Did the *Cassandra II* scale miss other important indicators picked up by the other measures? Do the ÖMPQ and *STarT Back* Tool paint a more realistic picture, or is it likely that these scores will decrease as the intensity of the back pain settles as the natural history seems to indicate? With the exception of a few items from the ÖMPQ, we have little knowledge of this person's work environment. How would these other contextual factors influence one's decision? A systematic review has recently examined work-related psychosocial factors but, consistently, psychometric properties of these instruments were found lacking (Gray et al. 2011). This illustration highlights that exclusive reliance on prediction tools for making decisions can be problematic. However, these tools offer some valuable information and likely best point toward a need for more detailed assessment of other contextual factors.

This cautionary summary of using predictive indices is not meant to completely dissuade the use of these tools. Rather, potential users should be aware of the limitations and carefully decide the extent to which their intended use is consistent with the context in which the tools were developed and tested and the population on which validity research was done. In addition, further research is needed to examine the validity of these tools with other populations and in varied settings. Finally, considering the complexity of the behavior RTW, predictive tools are likely best used adjunctively with shared clinical decision-making among stakeholders.

12.5 Conclusions

Predicting RTW is an important activity, with significant consequences for individual workers, their employers, insurance carriers, and other stakeholders involved in the management of disabling musculoskeletal disorders. A number of factors from a variety of domains, including personal, workplace, social, and system, have been found associated with RTW, and some prediction tools have been developed that may provide some useful information for predicting RTW. Risk prediction also appears to be a promising tool when combined with targeted early interventions. We have described three promising tools that are becoming more commonly used in practice (ÖMPQ, *Cassandra II* scale, and the *STarT Back* Tool). However, caution is recommended regarding widespread use of these tools in clinical practice given the early stages of validity testing and the fact that none of the tools have consistently achieved high levels of prediction accuracy in a variety of patient populations.

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Part III

Evidence Informed Return to Work Approaches

13

Bridging the Gap: Evidence-Informed Early Intervention Practices for Injured Workers with Nonvisible Disabilities

Izabela Z. Schultz, Catherine M. Chlebak, and Ada K. Law

13.1 Introduction: Pain Disability Guidelines Lead the Way

The need for evidence-based guidelines to prevent chronicity in musculoskeletal pain disabilities is well established. A number of significant societal pressures led to this conclusion. One is prevalence: this disability cluster forms a major cause of morbidity throughout the world, is associated with significant personal suffering and loss of quality of life, and has significant social costs (WHO 2003). Low back musculoskeletal injuries pose a formidable health-care problem for injured workers, in particular those under age 45, and with industries and compensation systems. They constitute the largest group of musculoskeletal pain disabilities (Koes et al. 2006; Picavet and Schouten 2003; Waddell 2004).

The economic implications are staggering. Although estimations point that 5–10 % of individuals develop chronic pain and disability, this group forms the majority of costs (Waddell et al. 2002) related to health care, loss of productivity, early retirement, and disability benefits. These costs are increasing significantly (Maetzel and Li 2002). Hills (2006) reported that in the United States, chronic low back pain (LBP) amounts to about $100 billion in treatment costs annually.

These serious societal health and economic issues have translated into focusing research contributions in the areas of early identification and the prevention of musculoskeletal pain disabilities. Significant clinical advances in understanding medical management of acute and subacute back pain episodes are seen in the initiation and promulgation of clinical guidelines (Bigos et al. 1994; Boden and Swanson 1998; NICE 2009; Rosen and Hoffberg 1998). However, this work has been hampered by methodological discrepancies, gaps, and a paucity of studies (e.g., Lin et al. 2011; Shaw et al. 2008; Van Oostrom et al. 2009). These issues will be discussed in more detail in the section on Barriers below.

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In response to the growing literature showing the utility of the biopsychosocial perspective in treating back pain, emerging guidelines have become increasingly integrative. They provide comprehensive advice about biomedical treatments such as cortisol injections and surgery, and have expanded to include small sections on psychosocial techniques, such as behavioral management. For example, guidelines by Chou and colleagues (2007) have incorporated evidence on the effectiveness of cognitive behavioral therapy (CBT) and multidisciplinary rehabilitation for chronic or subacute low back pain. Similarly, in their practice guidelines consisting mainly of medical treatments, Chou and Hoyt Huffman (2007) recommended multidisciplinary interventions with a cognitive behavioral therapy component based on strong evidence that this therapy reduced symptoms and absenteeism. They recommended that the diagnosis of LBP incorporate an assessment of a patient's psychosocial history, as it predicts chronicity of pain disability. A more updated guideline by Chou et al. (2009) stated that multidisciplinary treatment is at least as effective as surgery for certain types of back pain and it was recommended that clients are informed about this option. It also cautioned that multidisciplinary treatment requires time and effort in order to be effective. The incorporation of psychosocial treatment is not limited to subacute and chronic low back pain. In a practice guideline for the treatment of acute back pain in primary care settings, van Tulder et al. (2006) recommended strategies to assess psychosocial risk factors in patients, provide reassurance and education, encourage physical activity, and reassess psychosocial factors for patients with protracted recovery. The adoption of multidisciplinary interventions for back pain has been consistent globally, including countries from Europe, North America, and Australia (Koes et al. 2010).

Aside from the work described above, few integrative evidence-based practice guidelines have been developed for early intervention and secondary prevention of back pain occupational disability encompassing *both* clinical and occupational interventions (Waddell and Burton 2001). Although recent collaborations between American College of Physicians and American Pain Society (Chou and Hoyt Huffman 2007; Chou et al. 2007, 2009) and other research efforts have provided an updated view of the importance of multidisciplinary rehabilitation programs in integrative guidelines, the vast majority of the recommendations within these guidelines focus on biomedical treatments. Consistent with the biopsychosocial model of pain-related disability (Schultz et al. 2000, 2002, 2007) and the new paradigm for the management of occupational back pain (Loisel et al. 2001a; Waddell and Burton 2001; Waddell and Aylward 2009), multisystem, interdisciplinary interventions integrating both clinical and occupational components have shown the most promising outcomes thus far. Yet, knowledge mobilization is still in a relatively early stage. As a result, many early identification and intervention programs and approaches of unclear efficacy currently exist in clinical and case management practices, healthcare and compensation systems, and in the workplace.

This chapter aims to bridge the gap between early intervention research literature and practices in early intervention and secondary prevention for prevalent nonvisible occupational disabilities in clinical, occupational, and compensation contexts. The primary focus will be on LBP, specifically in the subacute stage, considered the "golden hour" for early intervention (Loisel et al. 2001a; Frank et al. 2000). The focus will be on growing literature on "best practices," emerging consensus-based guidelines for the clinical and occupational management of acute and subacute back pain (Bigos et al. 1994; Black et al. 2000; Boden and Swanson 1998; Brooker et al. 2000; Rosen and Hoffberg 1998; Waddell and Aylward 2009; Waddell and Burton 2001; Waddell et al. 2008), and a body of evidence-based studies of early interventions pertinent to workers at risk for chronic back pain disability.

This chapter will also cover temporomandibular joint and muscle disorders, the second most frequently occurring musculoskeletal condition after chronic back pain resulting in pain and disability (NIDCR 2008). Discussion will also extend to mental health disorders, especially highly prevalent anxiety and depression disorders. Gnam (2005) reported that depressive and anxiety disorders are considered "at least as prevalent as many chronic physical health conditions" (p. 374). Serious mental illness, although much less prevalent, is a significant challenge in the workplace and will also be covered.

13.2 Barriers to Knowledge Mobilization in Early Intervention with Back Pain Disability

This section reviews knowledge mobilization barriers identified in pertinent intervention literature on back pain disabilities. The themes include multiple methodological barriers to the integration and generalizability of findings, the validity of research evidence, and, ultimately, the mobilization of knowledge and development of research informed-practice guidelines.

13.2.1 Identification of Chronicity Risk in Workers

Despite the strongly articulated need for effectiveness and efficacy studies of early intervention with high-risk back-injured workers, since 1998 (i.e., Borkan et al. 1998), no comprehensive and empirically supported model of such an intervention exists in the literature. However, researchers have begun to examine this important population with controlled trials (Gatchel et al. 2003; Gatchel 2010; Schultz et al. 2008, 2013; Whitfill et al. 2010). Other researchers have identified the need to have different treatment protocols for the subgroups (Boersma and Linton 2005; Shaw et al. 2006; Steenstra et al. 2009).

Overall, however, studies either investigate specific components for intervention modalities of interest or offer a "package" approach with implementation of multiple interventions, either in a phase-like or simultaneous fashion. Few studies offer an integrated clinical and occupational intervention approach; if so, workers at a high risk for disability are not necessarily focused on (Anema et al. 2007; Loisel et al. 1994, 1997, 2001a; Karjalainen et al. 2003b). Schultz et al. (2008) summarized a number of barriers to this research such as overreliance by compensation systems on forensic models, non-standardized "flagging" of at-risk workers, delayed initiation of an interdisciplinary team in treatment and interventions, stakeholder communication difficulties, and the traditional passive role that the worker may take. Decreased productivity in the workplace, also known as presenteeism, is another significant issue to complement absenteeism (Main and Shaw 2015; Main et al. 2015).

Research, however, has begun to tackle the role a compensation system, such as workers' compensation or long-term disability insurance carriers within early intervention and prevention. The classic example is the Sherbrooke model, the ecological system-based integrated clinical and occupational approach postulated by Loisel et al. (1997). This model has since been replicated and adapted in European settings (e.g., Anema et al. 2003, 2007; Loisel et al. 2002; Steenstra et al. 2006).

13.2.2 Research Participants

Reviewed studies included the following types of research participants: general population, either in primary care or in specialized clinical settings, compensated injured workers (also accessed in different settings), individuals at high risk (versus low risk) for chronic disability, and mixed groups of disability factors.

In addition, interventions were tried with individuals with a diverse range of musculoskeletal conditions including upper extremity and back pain rather than only specifically and precisely defined LBP. The impact of heterogeneity of the research samples on generalizability of findings is unknown.

So far, the frequently assumed notion that all musculoskeletal pain conditions can be managed, or prevented, using similar approaches has never been fully empirically validated, and so caution is urged in generalizing. Finally, generalizability was also limited through the differing definitions of "acute," "subacute," and "chronic" and thus the samples of individuals in different stages of disability across studies.

13.2.3 Searching Literature for Empirical Evidence in Early Intervention

As this review's purpose was to develop evidence-informed intervention guidelines, primarily randomized controlled trials (RCTs) were selected from the literature and supplemented by recent literature reviews of evidence and emerging clinical guidelines (Bigos et al. 1994; Black et al. 2000; Boden and Swanson 1998; Costa-Black et al. 2010; Karjalainen et al. 2003b; Rosen and Hoffberg 1998; Waddell and Aylward 2009; Waddell and Burton 2001). Notably, since most studies published in the field were not RCTs, a large number of non-randomized case and qualitative studies using samples of convenience were seen. In the reviewed RCTs, comparison groups using "usual" or "traditional" care were utilized with one study using a placebo group.

13.2.4 Intervention Standardization

Inherent in applied clinical research are problems with standardization, particularly if psychosocial interventions, "real-life" settings, and multiple service providers are utilized. Attempts at standardization include manualized treatment protocols, such as those designed for cognitive behavioral therapy, general guidelines, and orientation provided to clinicians conducting interventions. Wide-ranging differences in measures to monitor the consistency or to periodically "recalibrate" interventions were noted. Generally, limited data was provided on the methods applied to ensure standardization. Therefore, difficulty exists to ascertain to what degree the study outcomes have been potentially affected by insufficient standardization.

The more multifaceted the intervention, and the more systems involved, the more variability is introduced into the intervention. Thus, replication of the most promising, interdisciplinary, and conceptually driven system-based interventions is likely to show significant variability and complications. Differing contexts of intervention (e.g., clinics, workplaces, and workers' compensation settings) constitute yet another source of variability.

Durand et al. (2007), in their review of workplace interventions, stipulated that the diversity of intervention content and actions reported created difficulty in establishing clear connections among processes, activities, outcomes, and interventions.

13.2.5 Measuring Outcomes

The effectiveness of intervention RCTs is also impacted by differences in outcome measurement. A popular outcome variable, return to work (RTW), has uniformity issues in multiple dimensions including time interval, term length, duration of disability, and definition and in the construct validity in the arena of functional status (Maetzel and Li 2002; Schultz et al. 2007; Steenstra et al. 2012). Other important outcome variables are the recurrence of disability, costs of disability benefits, health-care costs, and health-care utilization (Maetzel and Li 2002).

As empirically supported models of disability prediction differ depending on the set outcome criteria (Crook et al. 2002), likely so do intervention models. Specifically, an intervention showing a positive impact on immediate return to work may not necessarily have a positive impact on duration of disability costs or recurrence.

13.2.6 System-Based Barriers

Multiple system-based barriers to mobilization of knowledge exist in addition to methodological problems limiting reproducibility and validity of evidence and generalizability of findings which make meta-analytic studies difficult and systematic analysis of literature problematic. These barriers include the organizational characteristics of the system(s) that intend to implement the knowledge, in this case early intervention guidelines. The necessary interaction of four key systems: the worker, the health-care system, workers' compensation (or health/disability insurance system), and the employer, complicates the matter. The inherent ideological, legal, organizational, cultural, communication-based, and human resource-based differences among these systems interfere with how new knowledge can be accommodated and effectively utilized to advance early intervention and prevention of work disability in at-risk workers.

13.2.7 Guideline Flaws

Staal et al. (2002) compared key occupational guidelines from various countries and found a number of methodological challenges in the development. They include lack of clarity regarding reporting conflicts of interest and external reviewers used and limited discussions about the potential for future publications with updated guidelines. Some guidelines were explicit in this regard, while others were silent. The cost implications and organizational barriers in the guideline production were another key flaw. In keeping with these concerns, Loisel et al. (2005) noted that, "intervention recommendations are often imprecise and not yet practical for immediate use, many barriers exist, and many stakeholders are involved" (p. 507). At the end user level, physical therapists have reported difficulty in adhering to practice guidelines due to inadequate understanding of guidelines, lack of agreement with the guidelines, low perceived relevance of the guidelines to their practice, and the lack of compatibility of the guidelines with their clinical work (Côté et al. 2009). In a commentary on back pain treatment trends, Casey (2013) noted that treatment guideline adherence has been a challenge due to limitations in clinicians' awareness and familiarity with the guidelines, low outcome expectancy and motivation to implement the guidelines, the lack of time and resources to implement the guidelines, and the presence of contradictory guidelines.

13.3 Key Themes of Early Intervention

The review of current early intervention literature focusing on workers with subacute pain-related back disability revealed the following key themes and dimensions in effective early interventions:

1. Multimodal and multidisciplinary intervention model
2. Coordination among the stakeholders
3. Early and intensive interventions
4. Evidence-based medical care

13.3.1 Multimodal and Multidisciplinary Intervention Model

Existing clinical guidelines and Cochrane Reviews (e.g., Guzmán et al. 2001; Karjalainen et al. 2003b) have advised on multidisciplinary biopsychosocial rehabilitation programs for subacute populations. The traditional biomedical model is largely ineffective in this regard (Burton et al. 1999; Lelliott et al. 2008). This notion is reinforced by evidence, such as Waddell and Aylward (2009), who argued that workers' genuine beliefs that "they cannot and should not work" (p. 5) are often reinforced by medical advice. The authors also implicate the benefits system and misinformed employers in reinforcing these beliefs. Some of these beliefs are in stark contrast to what is indicated in the evidence. In fact, an international review of clinical practice guidelines for low back pain has noted that prescribed bed rest is consistently discouraged as a clinical practice in many different countries (Koes et al. 2010).

Evaluating the cost-effectiveness of multidisciplinary programs is a new area. Steenstra et al. (2006) reported that the early intervention group returned to work 1 month sooner than the usual care group; with a small cost increase of 19 Euro for 1-day less sick leave. Impressively, Loisel et al. (2002) showed cost-effectiveness and benefit at a follow-up mean time of 6.4 years with multidisciplinary work rehabilitation including occupational and participatory ergonomic intervention components. Anema et al. (2004) reported that the economics with a modified Sherbrooke model intervention showed a savings of approximately $9,300 USD per participant when compared with conventional care. With a light mobilization program involving education, Hagen and colleagues (2000, 2003) showed net benefits over 3 years of $2,822 USD per patient. Similarly, injured workers in Finland who underwent a vocationally oriented multidisciplinary program showed a drop in the rate sick leaves and disability-related early retirement, and this effect is observed for the 3 years following the intervention (Suoyrjo et al. 2009).

Early intervention studies with high-risk acute LBP patients showed economic advantage to treatment as usual. Areas of significance include fewer health-care visits, decreased loss wages, and missed work days when compared to the treatment-as-usual group (Gatchel et al. 2003; Rogerson et al. 2010). Rogerson et al. (2010) stressed that the "*observable difference in medical costs in 1 year alone would cover the entire cost of the EI* [*early intervention*] *treatment program*" (emphasis added; p. 393).

Evidence is building that a combination of optimum clinical management, a rehabilitation program, and organizational interventions designed to assist the worker with back pain to return to work is more effective than single elements alone. Moreover, hospital settings are not indicated as better than a brief intervention (Jensen et al. 2011).

Of particular importance is the integration of the clinical management of back pain with an occupational intervention to ensure sustained return to work and disability prevention (Anema et al. 2003, 2007; Loisel et al. 2001a). The involvement of all key stakeholders, including the worker, the health-care system, the employer, and the workers' compensation system, is particularly recommended (Loisel et al. 2001a; Shaw 2015) in addition to integrating workplace interventions of work modifications, workplace assessment, and case management with all stakeholders within a multidisciplinary model (Anema et al. 2007). Its effectiveness is not influenced by the socioeconomic system (Anema et al. 2004).

Generally, the most effective case management approach for early intervention with back-injured workers is one that utilizes many different components. As recommended by Frank et al. (2000), an intervention could include a quota-based physical activity program, ergonomic adjustment, and comprehensive case review. The evidence indicates that a multidisciplinary biopsychosocial rehabilitation program applied in subacute stage including a workplace visit or some form of comprehensive occupational intervention facilitates return to work and lessens sick time and perceived disability in working age adults (Karjalainen et al. 2003a; Lindström et al. 1992a, b; Loisel et al. 1997; Frank et al. 2000; Schiltenwolf et al. 2006; Turner et al. 2008). The exact reason for why this happens is still unknown, although it is believed that an early return to modified work, for example, can boost a worker's morale and lead to subsequent benefits (Main and Shaw 2015; Main et al. 2015).

Notably, Gatchel et al. (2003) demonstrated the effectiveness of an interdisciplinary team approach in which psychology, physical therapy, and case management work as a team that is guided by a nurse-physician team, with patients identified as being at high risk of disability. Significance was found in symptom improvement and cost savings when compared to usual care. To maximize the effectiveness of this approach, early screening for individual risk factors, such as perceived social support in the workplace, fear of reinjury, and low expectations of returning to work, may be conducted to allow clinicians to identify employees who are at higher risk of disability (Shaw et al. 2009b).

Examining population subgroups is a newer research activity. Workers with previous sick leave and older workers were identified as more suitable subgroups in applying this model (Steenstra et al. 2009). Schultz et al. (2008, 2013) reported that individuals classified as high risk were more suited to an early intervention multimodal model, supported by Gatchel et al. (2003) and Whitfill et al. (2010).

Schultz et al. (2008) conducted a pilot study comparing an early intervention approach with integrated, interdisciplinary, and multimodal components to a conventional worker's compensation case management approach. This study empirically demonstrated the effectiveness of EI in time loss reduction; for workers at the highest risk of protracted disability, statistically significant differences were recorded at 6 months post intervention. Schultz et al. (2013) conducted another study with the same population, building on the recommendations of the pilot. The results were notable for "incidental" findings associated with real-life-introduced study design changes that were not planned or anticipated by the research team; the worker's compensation setting introduced a new early intervention approach based largely on the pilot study. This change altered the control group intervention significantly with the only discernible difference between the groups was the intervention delivery. The control group used a flexible and need-driven ("real life") approach; the other group was more fixed, protocol-driven (standardized) method. Results showed that moderate-risk workers benefited more from a flexible, need-based, individual, and low intensity approach versus a fixed approach.

The interventions emphasized the importance of multisystem interactions, multimethod approaches, an enhancement of capabilities, resource use, and coordination. The workplace, primary health-care providers, and the worker's compensation system were critical systems in both. Within the worker's compensation system, implementation involved training, one-to-one sessions, early referrals, interaction with the family physician, and workplace visits.

Best Practice #1
Multimodal and multidisciplinary interventions designed to assist workers with back pain to return to work are more effective than single elements alone.

Best Practice #2

A multidisciplinary biopsychosocial rehabilitation program with workplace visits or more comprehensive occupational intervention facilitates return to work and lessens sick leaves and subjective disability in working age adults at the subacute stage.

Best Practice #3

The optimal early intervention program for patients at high risk for disability involves an interdisciplinary team consisting of psychology, physical therapy, and case management coordinated by a supervising nurse-physician team.

Best Practice #4

Early intervention for injured workers at elevated risk for disability in the compensation context needs to be matched to the risk of disability level.

Notably, Stapelfeldt et al. (2011) found that client subgroups with that had no work influence planning, felt at risk of job loss due to leave, and had low job satisfaction fared better with a multidisciplinary compared to a brief intervention.

13.3.2 Coordination Among the Stakeholders

At the subacute stage, injured workers, care providers, employers, labor unions, and payers need to work in concert in order for the recommended solution to be effectively applied (Frank et al. 2000). According to Loisel et al. (2001a), Anema et al. (2007) and Shaw (2015), workers' disability is influenced by the stakeholders' actions and attitudes and by interactions occurring among the stakeholders. Therefore, an effective early intervention requires coordinated efforts among the stakeholders to address pertinent clinical and occupational barriers to return to work and to facilitate employment.

An identified significant stakeholder is the employer (Costa-Black et al. 2010; Heymans et al. 2006; IWH 2007; Sullivan 2015; Waddell and Aylward 2009). Waddell and Aylward (2009), in their publication reviewing the key treatment paradigms, argued the significance of the employer's role in influencing a prolonged sickness absence. The Institute of Work and Health (IWH 2007) stipulated that to help facilitate a successful return to work, employers are recommended to find a meaningful job, coordinate with health-care providers, and to have early and thoughtful contact with their workers. The workers' genuine beliefs around their "inability" to return to work are often reinforced by employers that do not allow a return to work until the worker is "cured."

The workers' perception of job satisfaction, social support at work, job autonomy, employer attitudes, supervisory support, job stress, job strain, increased physical and psychological demands, lack of mental health interventions, and communication between the employer and the worker are also named as additional barriers (Melloh et al. 2012; Shaw et al. 2009; Waddell and Aylward 2009; White et al. 2013, 2015). White et al. (2015) provides a best evidence synthesis of modifiable risk factors from the workplace prospective and to evaluate workplace interventions related to the risk factors across health conditions and populations.

Workplace policies and practices are a critical related issue (IWH 2007; Main and Shaw 2015; Main et al. 2015; Tang et al. 2011) in disability prevention. Waddell and Aylward (2009) named the lack of "suitable policies or practice for sickness absence, return to work, modified work, etc." (p. 21) as a barrier in the process. Workers' perceptions of this issue appear to have no effect at the 6-month mark (Soucy et al. 2006). Evidence shows that upwards of 90 % of workers with common health complaints can be supported to return to work using basic principles of workplace and health-care management. The challenge is implementing these principles into practice.

Best Practice #5

Interaction and coordination among the multiple stakeholders is critical to the success of any return to work program.

Best Practice #6

Employers play a key stakeholder role in the return to work process; supporting and educating them in current health-care principles are of critical importance.

13.3.3 Early and Intensive Intervention

Examining the "golden hour" for early intervention (Loisel et al. 2001a; Frank et al. 2000) more closely, starting intervention at 4 weeks, has been shown the most appropriate for back injury. In fact, Elders et al. (2000) argued that starting interventions too early is needless due to the self-limiting effect of LBP. European clinical practice guideline (van Tulder et al. 2006) highlights the finding that certain back-specific exercises, such as stretching and strengthening, may be ineffective during the first week following the injury and recommends nonspecific exercises, such as aerobics over back-specific exercises for acute low back pain.

Frank and colleagues (2000) argued that at 4 weeks after the onset of back injury, clinicians become concerned about the failure to recover and the risk of long-term disability and chronicity. The number of lost time cases drops quickly over the first month and then stabilizes. Notably, cases that are off work longer than a month are more amenable to treatment to reduce subsequent disability than cases seen earlier. Furthermore, after the initial 4-week period, intensive physiotherapy, particularly supervised exercise instruction with ergonomic intervention at the work site, is more likely to be successful in preventing long-term disability and promoting timely return to work than the same measures applied earlier. Burton et al. (1999) also named that at the subacute stage, it may be less important what kind of treatment is given, so long as an intensive intervention is applied that is designed specifically to get the worker back on the job.

Recent clinical practice guidelines by Chou and colleagues (2007, 2009) recommend intensive multidisciplinary rehabilitation for pain patients at 4–6 weeks post-injury, with programs consisting of physician consultation coordinated with a psychological, physical therapy, social, or vocational interventions.

Best Practice #7

Implementing intensive interventions at the beginning of the subacute stage (4–6 weeks), before disability and sickness absence become protracted, is likely the most effective.

13.3.4 Evidence-Based Medical Care

Primary care plays a pivotal role in preventing disability arising from LBP. Côté et al. (2005) demonstrated that almost 90 % of workers receiving health care for their back pain did so from medical physicians, often combined with chiropractors or physical therapists.

In a study completed by McGuirk et al. (2001), general practitioners were trained to manage patients at the acute-subacute stages of a LBP episode. Dealing with the patients' fears and misconceptions was emphasized as well as providing confident explanations and empowering the patient to resume or restore the normal activities of daily living through simple exercises and graded activity. The initial results from evidence-based care were found to be marginally better than those from good usual care, but in the long-term, evidence-based care achieved clinically and statistically significant gains with fewer patients requiring continuing care and remaining in pain. In addition, patients seem to benefit from maintaining activity as normal as possible, as compared to inactivity and bed rest. The study suggested that information and fear reduction should also be offered systematically and consistently by the general practitioner. The physician's attempt to reduce the fear of "doing something wrong" to the back may be even more important than the physical components of intervention.

More recent Finnish study showed clearly that for patients with subacute LBP, mini early intervention by a team consisting of a physician and physiotherapist, which involved clinical examination, information, reassurance, support, and simple advice, reduced daily symptoms and work absenteeism and improved adaptation to pain and treatment satisfaction. With this type of early intervention, the workplace visit did not improve incrementally improved the outcomes (Karjalainen et al. 2004). A review study on early identification by Nicholas et al. (2011) found strong evidence that the targeting of psychosocial risk factors early on using psychological interventions leads to better functional and return to work outcomes.

Bogefedlt et al. (2008) demonstrated that a manual therapy program coordinated by a physician and physiotherapist team and involving an exercise, corticosteroid injections (where indicated), and other passive treatments showed decreased sick leave and increased return to work more than standard care. The study reported observable differences seen as early as 10 days into treatment, reduced pain, and improved functional outcomes. Consistent with these findings, a review by Chou and Hoyt Huffman (2007) showed that daily interdisciplinary rehabilitation had a superior effect on functional status compared with non-interdisciplinary rehabilitation.

Best Practice #8

Providing evidence-based care to primary care patients with back pain is effective in reducing the numbers of patients moving on to chronicity.

Best Practice #9

Early examination, information, support, simple advice, and reassurance by the physician/physiotherapist about the benign nature of nonspecific back pain and the importance of maintaining activity as normal as possible are likely to assuage fears and facilitate return to work.

13.4 Specific Components of Early Intervention with Back-Injured Workers

In addition to the key dimensions of early intervention, current research literature provides support for the implementation of specific components of early intervention with back-injured workers. These components include the following:

1. Case management
2. Coordination between primary physician and workers' compensation team
3. Assessment of workplace, modifications, and accommodations
4. Return to pre-injury activities
5. Exercise and physical restoration
6. Cognitive behavioral interventions
7. Support through technology

13.4.1 Case Management

In keeping with the theme of integration and coordination of services and interactions among the stakeholders, the instrumental role of case management in facilitating return to work is critical.

Arnetz et al. (2003) reported that having a proactive case manager and introducing an ergonomist to the stakeholder group were important. Russo (2002) examined the role of case managers when assumed by non-nursing professionals, specifically by rehabilitation counselors, physiotherapists, occupational therapists, and psychologists. No significant difference was found between professionals.

Case management and clinical direction provided to interdisciplinary early intervention teams by a nurse-physician team were also found to be critical components of an effective early functional restoration program designed for patients at high risk of disability (Gatchel et al. 2003). Bernacki and Tsai (2003), in an analysis of patient data from a compensation system database over a period of 10 years, found that effective communications among the worker, the employer, and the compensation system, evidenced by the worker's physical and psychological needs being met, were associated with a reduction in workers compensation costs overtime. Similarly, a study in Australia (Iles et al. 2012) found that companies that utilized a coordinated model of case management focusing on early reporting of injury, early medical diagnosis treatment, prompt return to work on modified duties, and intentional communication among the employer, the employee, and the compensation system were able to reduce the number of days of compensation, total claim costs, total medical costs, and the amount of weekly benefits needed.

Best Practice #10

Training nurse advisors in modifying workplace ergonomic risk factors as a component of the workplace accommodation process results in a greater number and diversity of worksite accommodations recommended and implemented and may improve return to work outcomes in injured workers.

Best Practice #11

Clinical case management is a critical component of an interdisciplinary functional restoration program for high-risk patients, reducing work disability and demonstrating substantial economic benefits to the payees.

13.4.2 Coordination Between Primary Care Physician and Workers' Compensation Team

The coordination of RTW planning and recovery between a treating physician and workers' compensation medical team was examined by

Rossignol and colleagues (2000). Workers' compensation medical staff saw the worker immediately after the worker's name was given to the team to receive clinical evaluation. Medical staff made a diagnosis by considering three aspects: medical, psychosocial, and occupational. Subsequently, they established an evidence-based action plan with the worker in accordance with clinical guidelines for the management of subacute back pain. The conclusions and recommendations were explained to the worker, and a summary was sent to the treating physician. Subsequently, the workers' compensation medical team provided assistance to the treating physician with finding and scheduling diagnostic and therapeutic procedures as appropriate. Nurses made weekly phone calls to the worker (standardized) and followed-up the worker's questions and problems presented each week. This type of coordinated medical care was shown to be effective.

Evidence suggests that adherence to best practice recommendations as described above can improve patient outcomes. For example, in a pilot project at the Occupational Health and Educational Centers, Wickizer et al. (2011) provided physicians with financial incentives to encourage them to increase best practice adherences, provide support organizationally, and improve health information technology. With the introduction of incentives, there was a significant reduction in sick days (29.5 %) and an average reduction of $510USD per claim including all musculoskeletal claims.

In conclusion, coordination among the workers' compensation medical team, treating physician, and the worker yields the most positive effects. Furthermore, contact between workers' compensation medical teams and treating physicians to facilitate referrals and services can also reduce unnecessary health-care services and costs (Bernacki et al. 2006; Rossignol et al. 2000). A meta-analysis of randomized controlled studies (Schandelmaier et al. 2012) found a modest but reliable effect that patients who are provided with return to work coordination are more likely to return to work and to show less pain disability as compared to patients in treatment-as-usual groups.

Best Practice #12

Coordination among the worker, the treating physician, and the workers' compensation medical team is effective in returning back-injured workers to work faster in subacute stage.

Best Practice #13

The therapeutic results for workers with back pain could be improved by implementing the clinical practice guidelines with primary care physicians without delaying the return to work.

13.4.3 Assessment of Workplace, Modifications, and Accommodations

Franche et al. (2005), in their systematic review of workplace intervention effectiveness, reported that work accommodation offers and contact between the employer and the health-care provider consistently showed a significant reduction in workplace disability duration. Interventions involving early contact by the employer to the worker, ergonomic site visits, and the inclusion of a RTW coordinator have moderate evidence. Pomaki et al. (2012) recommended providing assistance navigating disability management systems. With a worker back at work, improved business outcomes are associated with increased worker support (Aas et al. 2011).

A study revealed that nurses trained in the workplace accommodation process recommended more changes to the work environment, including workstation layout, computer-related improvements, furnishings, accessories, and lifting/carrying aids than untrained nurses. These changes appeared to facilitate return to work. Untrained nurses generally limited recommendations to light duty and lifting restrictions. Evidence indicates that nurses trained in the workplace accommodation process promote and practice behaviors that may improve return to work outcomes (Lincoln et al. 2002).

The evidence from the literature indicates that modified work programs facilitate return to work for temporarily and permanently disabled workers. Modified work includes light duty, work trials, job accommodation (and the targeting of barriers), disability management programs, supported employment, job-employee matching, and graded work exposure (Krause et al. 1998; Schultz et al. 2012). Injured workers who are offered modified work return to work about twice as often as those who are not. Similarly, modified work programs cut the number of lost work days in half and are cost-effective. A study by Yassi et al. (1995) demonstrated the effectiveness of work rehabilitation and job modification in an early intervention program for hospital nurses. It is also indicated that worker's active participation has been instrumental in successful modified work programs (Loisel et al. 1998, 2001b). In their review, however, Nielson and Weir (2001) noted that there is inadequate evidence to determine what particular aspects of modified work programs are helpful. Anema et al. (2009) supported the suggestion that failure of modified work programs hinges more on failed social transactions versus the worker's medical condition (Waddell and Burton 2001). This suggestion is supported by a recent qualitative study on social interactions in work accommodations process involving injured workers with low back claims, which emphasizes importance of balancing trust and control (Kwan and Schultz 2015).

Anema et al. (2007) in a workplace intervention involving job modifications, workplace assessment, and case management with stakeholders showed a significant reduction in sick leave compared to usual care. Arnetz et al. (2003) demonstrated that employees that were in a workplace intervention focused on functional capacity compared to traditional case management had a reduced total mean of sick days by about 50 days a direct savings of $1195 USD per case. Adapting the workplace to suit the employee with focus on what the employee could still do was an important feature.

White et al. (2015), in a systematic review of literature examining workers across health conditions and populations, identified a number of interventions that modified key risk factors including emotional distress, decreased physical activity, and increased pain. They included job demand interventions, in particular reducing job demands but also factors such as rest breaks, and job control interventions where the worker has control over work demands that have documented positive impacts. Finally, workplace policy and wellness interventions that target general workers have shown moderate to strong evidence.

Best Practice #14

The temporary provision of lighter or modified duties facilitates return to work and reduces time off work.

Best Practice #15

The worker's active participation is instrumental in effective modified work programs. In social interactions around implementation of workplace accommodations, balancing trust and control of the stakeholders in the process may facilitate the outcomes.

13.4.4 Return to Pre-injury Activities

Patients with back pain need to return to normal activities as soon as possible, but they are often afraid that movement or activity may be harmful. Clinical examination, information, reassurance, and encouragement, provided in a manner designed to reduce fears and to engage in physical activity as normally as possible, were effective in reducing sick leave (Hagen et al.

2000; Indahl et al. 1998; Moffett et al. 1999). In addition, Indahl et al. (1998) argued that "light normal activity may help restore normal function" (p. 2629).

Hagen and colleagues (2000, 2003) studied the impacts of providing information, encouragement to engage in physical activity as normal as feasible, reassurance, and an examination; they found a gain in the first year but not in the following 2 years. Gains included significantly fewer sick days and more stretching when compared to the control group. After 1 year, diminished effect in coping strategies was reported. Recent clinical practice guidelines (Koes et al. 2010) highlight literature that consistently shows benefits to staying at work or a prompt return to work following onset of low back pain. Providing a low back pain patient with multidisciplinary treatment that includes vocational intervention shows moderate level of effectiveness (Chou et al. 2007).

Best Practice #16

Workers with subacute back pain need to be encouraged to return to normal activities including work activities as soon as possible.

Notably, however, a recent Cochrane Review indicated that the advice to stay physically active may not be as effective if implemented as single treatment (Hagen et al. 2002). Caution therefore applies to the central assumption of clinical guidelines for subacute back pain that the sole focus on encouraging return to normal activities in high-risk patients is sufficient in preventing disability. As well, Chou et al. (2009) also notes that physical activity following low back injury is more likely to be effective when the patient is engaged and motivated.

13.4.5 Exercise and Physical Restoration

Many studies have demonstrated that exercise is an effective element in return to work programs; this is not surprising given that LBP occurrence is related to the nature and intensity of the physical activities undertaken (Heneweer et al. 2011). White et al. (2015) in a systematic review of research with workers across conditions and populations identified that exercise interventions, in particular short, simple exercise or fitness programs, impacted work absence, productivity, and financial outcomes.

One program, graded activity, has roots in cognitive behavioral therapy due to links with the Fear-Avoidance model (Sullivan 2015). Lindström and colleagues (1992a, b) graded physical activity programs that were shown to significantly reduce long-term sick leave, especially in male patients. The patients in the graded activity program learned that it was safe to move while regaining function. The patients with subacute, nonspecific, mechanical LBP who participate in the graded activity program regained occupational function faster than did the patients in the control group, who were given only traditional care. Hlobil et al. (2005, 2007) found that graded activity for nonspecific LBP may be beneficial in the employer's perspective; compared to usual care, this intervention was found to be only slightly more expensive with substantial benefits, including reduced absence, noted even at the 3-year mark. Subgroups of workers who were moderate in both in their perceived disability and fear-avoidance beliefs had higher probability of returning to work. This finding suggests targeting treatment to these populations; however, more research is needed (Staal et al. 2008). Steenstra et al. (2003, 2006) found that graded activity prolongs work absence when combined with other interventions or with delayed referral.

The efficiency of medical exercise therapy and conventional physiotherapy in patients between 8 and 52 weeks following back injury as compared to self-exercise, as measured by costs for days on sick leave, was demonstrated in a study by Torstensen et al. (1998). In addition, interdisciplinary, team-based functional restoration programs designed for patients at high risk of disability have been found to be both cost-effective and useful in reducing disability (Gatchel et al. 2003).

Hagen et al. (2010) reported that adding physical activity to a brief intervention involving encouragement and information did not increase probability to return to work when compared to the control group. Pengel et al. (2007) found that advice and physiotherapy-focused exercise were slightly more effective than sham advice and exercise; this benefit diminished at 12 months.

In a combination intervention involving preventative exercise and cognitive behavioral therapy, Jensen et al. (2005) found significance with women only using this combination of interventions. Rogerson et al. (2010), with a similar intervention with high-risk workers lead to significant improvement in a 1-year follow-up in addition to fewer health-care visits and missed days of work when compared to the treatment-as-usual group. Guidelines for acute, subacute, and chronic low back pain have noted evidence showing the effectiveness of physical activity and the lack of effectiveness in prescribed bed rest for treating pain symptoms and decreasing absenteeism (Chou et al. 2007, 2009; Koes et al. 2010; Weiner and Nordin 2010; van Tulder et al. 2006).

Best Practice #17

Patients with subacute back pain who participate in graded physical activity regain work function faster. Women may benefit from a combination approach with cognitive behavioral therapy.

Best Practice #18

Those subacute patients with LBP who are at risk for disability benefit from an interdisciplinary functional restoration program.

13.4.6 Cognitive Behavioral Interventions

Sullivan (2015) emphasized that with pain conditions, cognitive behavioral therapy is best conceptually and empirically understood. A variety of cognitive and/or behavioral interventions (e.g., self-control, beliefs, coping and problem-solving skills, thoughts, or cognitive appraisals) have been developed to promote more effective pain management strategies. Research indicates that these strategies are recommended for subacute populations (Chou et al. 2007; Frank et al. 1996; Raine et al. 2002). Graded activity, discussed in another area in this chapter, is also advised.

Related interventions may have some value. For example, educational approaches are considered to have limited impact as individual interventions (Hagen et al. 2003, 2005; Schultz et al. 2008; Sullivan 2015). However, Karjalainen (2004) noted that a coordinated approach where physicians and therapists provide the same information and advice and use educational material for reinforcing the message has the most powerful effect. This is particularly effective with patients with a high perceived risk of not recovering. In addition, problem-solving approaches, considered a type of stress-management program, are emerging approaches (Sullivan 2015). In combination with graded activity, problem-solving therapy may have "supplemental" (p. 87) value to employees with nonspecific LBP (Van den Hout et al. 2003).

Cognitive behavioral interventions are considered a "preventative method" (Hall et al. 2011) in addressing those identified to have chronic symptoms. They reported that symptoms of stress and depression are found as early as 6 weeks post-injury and play a role in chronicity by about 12 weeks. These psychological distress components contribute approximately 30 % to the association between subacute pain and future disability. Anxiety was not found to play a significant mediating effect.

Reinjury and pain fears may be more disabling than the pain (Storheim et al. 2005).

Stewart et al. (2012), in a qualitative study, added that perceived uncertainty may play a role as an "overarching influence…in multiple dimensions" (p. 10). Boersma and Linton (2005) found that fear-avoidant and distressed fear-avoidant profiles were linked with long-term sick leave. Shaw et al. (2006) reported that high-risk individuals fell into immobilized, disemployed, and overwhelmed categories. Steenstra et al. (2010) supported these findings. Pain-related fear, catastrophizing, kinesiophobia, and related psychosocial variables have been strongly correlated with self-reported disability (Heymans et al. 2009, 2010; Linton et al. 2011; Pincus et al. 2002; Reme et al. 2009; Sullivan 2015; Sullivan et al. 2005; Waddell and Aylward 2009). Past low back pain history and pain intensity may also play a role (Heneweer et al. 2007, 2010). More research is required in the areas of coping strategies and fear avoidance (Pincus et al. 2002).

Looking directly at the research, Linton and Andersson (2000) demonstrated that participants in the cognitive behavioral therapy group had fewer days off work and consumed smaller amounts of health care. This finding has important implications because it demonstrates that chronic problems can be prevented by providing self-help-oriented intervention (Linton and Andersson 2000; Linton et al. 2005; Moore et al. 2000). In a similar effort, Du Bois and Donceel (2012) provided injured workers with counseling addressing common maladaptive cognitions and beliefs in their single-blinded, randomized controlled trial. Results showed a significantly lower relapse rate when compared to the control group and a higher return to work rate. As well, Marhold et al. (2001) used a "cognitive behavioral return to work program" focused on coping skills and return to work. Participants were taught to apply pain coping skills to various occupational risk factors at their workplace. Recent research on an effective interdisciplinary functional restoration approach to early intervention targeting persons at risk for disability also involved a psychological component using a cognitive behavioral approach (Gatchel et al. 2003).

Slater et al. (2009) suggested that this therapy may be more effective with first-onset LBP. Interestingly, Linton et al. (2005) reported that the addition of a preventative physical intervention to this therapy produced no significant effects. Jensen et al. (2005) found significance with women only using this combination of interventions. Other studies support the use of physiotherapists or nonpsychological professionals conducting brief psychosocial interventions (Göhner and Schlicht 2006; Main and Shaw 2015; Main et al. 2015; Shaw et al. 2011; Sullivan and Adams 2010).

De Bruijn et al. (2007) performed a cost-benefit analysis with a program aimed to prevent the development and induce appropriate maladaptive behaviors and cognitions, using principles of operant conditioning. They concluded that this program is not currently cost-effective.

Sullivan and colleagues developed a popular cognitive behavioral program, the Progressive Goal Attainment Program (PGAP), for treating pain conditions using a tailor approach based on potential risk factors (Sullivan et al. 2005; Sullivan 2015). They examined injured workers with acute and subacute LBP and found reductions in catastrophic thinking, perceived injustice, and movement fears; treatment outcomes included a 15 % return to work readiness and a 45 % return to work (Sullivan and Adams 2010; Sullivan and Stanish 2003). Sullivan and colleagues also found that treatments targeting catastrophic thinking and movement fears are effective as an early intervention for those with mild depression but not with moderate to severe depression. For the latter group, cognitive interventions are best delivered at a later stage of treatment (Sullivan et al. 2006).

Best Practice #19

A cognitive behavioral approach that addresses depression, stress, fears of reinjury and pain, catastrophizing, and uncertainty is likely to be effective in early intervention, especially for mild depression. Past pain history and current pain intensity need to be reviewed.

13.4.7 Support Through Technology

Supporting workers through technology including the telephone or the Web may improve self-efficacy and reduce fears of reinjury (Henrotin et al. 2006). Instrumental or social support has been advocated as a method to improve coping and psychosocial adjustment to illness (Roberts et al. 1995). Del Ponzo-Cruz et al. (2012), in a study where the effects of an online occupational postural and exercise intervention were evaluated, showed utility of this with prevention of chronicity of subacute nonspecific back pain with office workers. De Jong et al. (2009) reported on the efficacy of a web-based counseling intervention (i.e., Snelbeter [Get Well Fast]). Although utilization was low to moderate, workers and employers expressed interest in its concept. Combining this intervention with face-to-face therapy may be more effective. A meta-analysis of 22 randomized controlled trials of computerized CBT for depression and anxiety disorders showed a substantially greater benefit on patient outcome compared to control groups (Andrews et al. 2010). Moreover, evidence for both short-term and long-term benefits was found. The authors of the study noted the benefits of greater accessibility and the guarantee of treatment fidelity when a psychotherapy component is delivered through a computer program without the full one-on-one involvement of a clinician.

Best Practice #20

Using technology-based services such as brief, 5 min clinician-initiated telephone calls once every 2 weeks with emphasis on active listening, offering supportive and encouraging comments and monitored Web-based programs, may be effective.

13.5 Emerging Trends in Other Nonvisible Conditions: Temporomandibular Joint and Muscle Disorders and Mental Health Disorders

13.5.1 Temporomandibular Joint and Muscle Disorders

Temporomandibular joint and muscle disorders (TMJMD) typically involve changes such as degenerative, internal derangement, muscle disorder, or disk displacement of the temporomandibular joint; however, combined muscle-joint disorders are also included. Estimates point to 75 % of the US population experiencing TMJMD symptoms during their lifetime with 5–10 % of the population needing treatment, costs which exceed $4 billion annually (The American Academy of Orofacial Pain 2004; NIDCR 2008). Up to 28 % of individuals with TMJMD report limitations, disability, and unemployment (Von Korff et al. 1992).

Research clearly asserts the importance of early intervention with this population: as the pain duration increases, individuals become resistant to the often costly interventions, and more complications with dental and psychosocial factors are found (Gatchel 2002; Gatchel et al. 2014). The Institute of Medicine of the National Academy of Science (2011) iterated this, naming an urgent need for better pain management due to rising health-care costs.

Evidence suggests that psychosocial factors contribute to the course of TMJ pain, just as they do for low back pain. In a study of TMJ patients recruited from the community in the United States, patients' level of depression and catastrophization of pain predicts greater pain intensity and chronicity pain measured at an 18-month follow-up period (Velly et al. 2011).

Success has been shown with a combined cognitive behavioral and biofeedback treatment approach (i.e., a bio-behavioral intervention), in particular for individuals at risk for chronicity. Findings showed significant reduction in the prevalence of chronicity and distress and reduced health-care visits (Epker et al. 1999; Gatchel et al. 2006). This was sustained at the 1-year mark (Gatchel 2010). Cost-effectiveness has been examined as well. Stowell et al. (2007) found a significant reduction in costs when compared to the treatment-as-usual group; past research such as Chiles et al. (1999) supported this conclusion.

Sanders et al. (2013), in their preliminary study, examined the effectiveness of a bio-behavioral intervention that was compared to a psychoeducational group that learned about self-care and pain management. Results showed that pain-related disability, emotional distress, and pain had significance in reduction from baseline to post intervention. No significance was shown between the two intervention groups. This difference may be attributed to time: other studies such as Gardea et al. (2001) and Mishra et al. (2000) reported differences after 1 year. Overall, however, the evidence for cognitive and behavioral treatments for TMJ pain is currently insufficient, and there is no consistent evidence indicating their effectiveness (Liu et al. 2012). More randomized controlled trials and treatment studies are needed to clarify the appropriateness of psychological and behavioral interventions for TMJ.

13.5.2 Mental Health Disorders

Mental disorders are viewed as a major cause of work absence, resulting in part from prevalence peaking during working years (Hensing et al. 2006; Hensing and Wahlström 2004). In fact, for Western Europe, this population constitutes about one-third of awarded disability pensions (OECD 2003). In the United States, mental illness is the second leading cause of disability (Social Security Administration 2009).

Roelen et al. (2012) reviewed return to work outcomes with employees with mental disorders as classified by the International Classification of Disease. They reported that 94 % sick absences were emotional, mood, neurotic, somatoform, and stress related. Depressive and anxiety disorders are considered most common (Gnam 2005; Mykletun et al. 2006; Wald 2011). Serious mental illness will also be covered.

White et al. (2015) identified that mental health interventions in the workplace had significance across all health conditions and populations in regard to absenteeism, financial outcomes, and performance outcomes. Key examples identified are lower intensity education and/or high intensity cognitive behavioral therapy, coping sessions, and problem-solving. A range of workplace treatments was identified in research, including a multidisciplinary program (Dick et al. 2011) to a cognitive therapy program for women (Carroll et al. 2010). A clear majority of the data showed a positive impact on the outcomes; however, more research is required to confirm these results. A focus on standardization of outcomes and interventions is recommended (e.g., Czabala et al. 2011; Furlan et al. 2012; Richardson and Rothstein 2008).

13.5.2.1 Anxiety and Depression

A number of longitudinal studies show that symptom severity changes within the same time period as disability level (e.g., Judd et al. 2008). Various measures of disability, including role impairments and work loss (self-reported), have strong associations with mental disorders; the strongest connections for occupational disability are indicated with panic disorder and major depression (Gnam 2005). Certain occupations such as laborers and sales and clerk workers are particularly vulnerable (Kessler et al. 1997). Age is also a factor influencing workers' outcomes from a mental health issue. A more recent review study found that patients who are aged 50 or older are more likely to have continued disability and to take longer time to return to work (Cornelius et al. 2011). In addition, comorbid anxiety and depression, when compared to each disorder individually, have a greater sick absence possibility and are more strongly related to the risk of disability pension (ESEMeD 2004). As well, chronic physical disorders have been found to occur with mental disorders at "rates far greater than what is predicted by chance" (Gnam 2005, p. 378). Gnam (2005) recommended a diagnostic screening tool broad enough to capture most anxiety and mood disorders and included questions to detect chronic conditions that are physical.

Early intervention is critical. Roelen et al. (2012) recommended "to maximize the likelihood of RTW, a focus on RTW is important in the first months after reporting sick with mental disorders" (p. 409). They recommended a reevaluation of the worker by the health-care provider (e.g., diagnosis, further treatment) if the RTW exceeds 1 month for anxiety disorders and 3 months for mood disorders. Vlasveld et al. (2013) found that for workers who are 45 and older and off work for at least 4 weeks with moderate to severe symptoms of depression, high physical symptoms, high physical job demands, and contact with medical specialists are associated with a longer RTW. Early intervention on modifiable factors is recommended.

A number of pharmacological and psychosocial interventions effectively treat depression and anxiety disorders. Work-based interventions include individual, organizational-based, and a combined individual and organizational-based approach. For the former, this includes CBT and a combined CBT and graded activity approach.

Peer and Tenhula (2015) also recommended a number of RTW strategies:

1. Integrating CBT principles within the RTW program goals and activities is important. Studies suggest that CBT with graded activity showed better results than CBT as a standalone intervention (e.g., Blonk et al. 2006).
2. Participatory interventions involving the worker are necessary. They need to ensure mutually agreed-upon goals and involve problem-solving with the employee on accommodations, overcoming barriers and other issues. Schultz et al. (2011), in their literature review, recommended the following accommodations: job description modification, flexible scheduling, workplace environmental changes, job sharing, assistive devices, using coworkers as mentors, and behavioral interventions, such as regular meetings. Conyers and Ahrens (2003) conceptualized accommodations along the realms of cognitive, interpersonal, motivational, and symptom exacerbations.
3. With more severe anxiety and mood disorders, consideration should be given to using more intensive, combined approaches. Research has shown that typical CBT interventions are more effective on milder disorders; thus, more optimization is required for the more severe clinical scenarios. One way may involve extending the treatment time.

For anxiety disorders, Wald (2011) noted a lack of empirically based practice guidelines for rehabilitating workers who are afflicted. Based on a review of existing research, she noted that effective interventions would likely involve early return to work accommodations in order to prevent secondary stresses such as loss of identity from unemployment. Nash-Wright (2011) recommended the following factors for successful management and RTW: early contact for addressing motivational difficulties, early assessment and treatment in situations with comorbidity with physical injury or illness to prevent long-term absence, address conflicts at work, and establish a clear, specific return to work plan that includes dates and accommodations.

In terms of depression, Wisenthal and Krupa (2013, 2014) highlighted the impairing effects of cognitive symptoms and recommended a cognitive work-hardening approach, whereby a worker would take on increasingly cognitive demanding tasks with an aim of regaining the ability to perform his or her job. According to the authors, a structured protocol has been devised, and empirical examinations of this intervention are under way.

13.5.2.2 Serious Mental Illness

Kessler et al. (2003) defined serious mental illness (SMI) as a conglomeration of features connected to an ongoing, persistent mental disorder; typically, SMI includes a major mental disorder and often one with psychosis. Individuals with severe anxiety disorders likely require a more involved and comprehensive set of treatment that includes a combination of vocational, psychological, and pharmacological supports (Wald 2011).

For SMI related to psychosis, early identification and intervention have been the primary focus for clinicians and researchers. Essentially, early interventions with SMI involve treating individuals before or at the time their first illness episode. Krupa (2015) offered the following best practices following evidence-based research:

1. Creating positive changes in labor market attachment for individuals with SMI needs to incorporate a spectrum of outcomes to address the various work-attachments levels.
2. Rapid placement with ongoing employment support.
3. Addressing negative attitudes toward SMI in the workplace through education, policy, and resources.
4. Supporting individuals in developing meaningful workplace experiences; this includes advising in areas of career planning and training and education.
5. A biopsychosocial approach to understand and define barriers to success.

In case of young individuals with serious mental illness diagnosed before entering the world of work, additional early intervention challenges include designing appropriate transitional programs between school and work. There is growing recognition in the literature that this transition likely has important clinical and vocational implications for mental health populations (Archie et al. 2005).

One model of clinical practice for individuals who show early signs of psychosis is the early psychosis intervention model emerging from Western Europe, Australia, and North America. Specifically, it recommends a team approach focusing on detection of first episodes, timely access to services, recovery from first episode, and decreasing risk to developing secondary comorbid symptoms (Durbin et al. 2014). Early interventions for psychosis (EPI) typically involves a combination of pharmacological treatment; case management; psychosocial treatment, such as psychoeducation and CBT; and active community supports such as family counseling and home visits (Durbin et al. 2014; Hastrup et al. 2013). Recent evidence suggests that early intervention programs are more cost-effective than standard community treatment (Hastrup et al. 2013; Hoffmann et al. 2014; McCrone et al. 2010). Some of the EPI models include vocational rehabilitation and counseling, but there is insufficient research and program development on this potentially important aspect of the intervention.

According to Krupa (2015), a prompt return to work is beneficial for individuals with SMI, due to the health benefits of working, including a set daily structure, regulation of the sleep and wake cycle, socialization, and meaningful contexts for applying coping strategies. As well, vocational rehabilitation that is conducted with sensitivities to the needs of the individual with an SMI and coordination among stakeholders lead to positive outcomes (Krupa 2011). One of the most widely researched models of vocational rehabilitation for individuals with SMI is the individual placement and support (IPS) program.

The main tenets of this approach include helping the individual obtain competitive employment, rapid job placements, promotion of inclusion and discouragement of stigma, attending to consumer preferences, integration of vocational and clinical supports, provision of personalized benefits' counseling, and development of a working relationship between employment specialists and employers in the community to facilitate optimal job placements (Marinoa and Dixon 2014). In a randomized controlled trial of 100 unemployed individuals with an SMI, Hoffmann et al. (2014) found that, compared with standard vocational rehabilitation, IPS programs generated greater social and economic benefits, including reduced number of hospital admissions and time spent in hospitals, increased number of hours worked, and greater employment stability. Individuals with a dual diagnosis of an SMI and a substance use disorder require a combination of mental health and drug and alcohol treatments. A review of the literature (Horsfall et al. 2009) suggests that young people presenting with initial episode of psychosis and substance use benefit from early interventions that focus on a prompt decrease in substance use, which would reduce the likelihood of substance-induced psychological symptoms. Evidence suggests that the recommended practice for individuals with dual diagnosis including an SMI involves assertive community treatment (ACT), intensive outpatient treatment, psychosocial interventions of motivational interviewing regarding substance use and CBT, case management, and, where necessary, residential treatment for substance use (Drake et al. 2008).

13.6 Compensation Context and Best Practices

Knowledge mobilization involving the development of evidence-informed best practice guidelines has traditionally been aimed at clinicians working in health-care or rehabilitation settings. However, without support for the guidelines by system-based stakeholders such as workers' compensation or long-term disability companies mandated to provide and pay for the care of the insured working population, wide scope implementation at the regional or national level is impossible.

The implementation of evidence-informed guidelines tends to falter at the intersection between a clinical setting and compensation setting, yet very few studies recognize and investigate this. As early as 1995, having a workers' compensation claim was identified as one of the key predictors of work disability (Gatchel et al. 1995). Likewise, the workers' compensation system and employer's response to the low back injury claim constitute some of the key predictors of duration and costs of disability in the subacute stage (Franche et al. 2005; Schultz et al. 2002, 2004, 2008).

The process of implementing clinical guidelines, particularly those pertaining to a disability that does not conform to the "black and white" biomedical model, is highly politicized and requires an integrated biopsychosocial approach. Organizational characteristics of the compensation system need to be recognized. These systematic characteristics are likely to serve as barriers to knowledge mobilization and the implementation of guidelines. They include but are not limited to the following factors:

1. Preference for biomedical, psychiatric, or insurance/forensic model as compared to biopsychosocial model in conceptualization and management of injury, diagnosis, rehabilitation, return to work, and prevention (Loisel et al. 2005; Schultz et al. 2000, 2007).
2. Preference for a medicolegal approach to service with focus on entitlement, causality, determination, and compensability rather than rehabilitation (Schultz and Brady 2003); focus on litigation and identification of "secondary gain" and suboptimal motivation tends to create an adversarial service climate and prolong disability due to the lost capacity to intervene early, before chronicity sets in.
3. Risk for disability identification system difficulties, including generalizability issues and challenges with the specificity and sensitivity of risk identification tools and the valid use of the advanced, multivariate predictive models for specific contexts, outcomes, and populations (Schultz et al. 2008, 2013). Typical systems are based on internal system-produced consensus that may not be intuitive to practitioners outside of these systems. Although the multicolor flag system developed by Steven Linton and colleagues has provided some consistency in the labeling of risk factors among studies, there continues to be disagreements among professional governmental, payer, and consumer groups over what is the best way to evaluate the effectiveness of a low back pain intervention (Casey 2013).
4. Vocational rehabilitation and return to work efforts are often initiated too late in the process, in cases of musculoskeletal injury well past the 4–6-week "window of opportunity" after the injury, when chronicity has already set in and an adversarial relationship with the insurer has already developed.
5. The worker's role is to be passive recipient of services ("a claimant") rather than an active participant of the recovery and return to work process.

6. Compensation systems, by virtue of their mandate, policies, and business model of service delivery (as compared to a clinical model), focus more on "claim management" rather than the true interdisciplinary case management necessary for the success of early intervention programs.
7. Self-contained nature of insurance systems, with limited interaction/collaboration with other system-based stakeholders, particularly in the early life of a claim.
8. Reluctance to measure psychosocial factors for risk determination. Liability concerns connected to potentially adverse legal outcomes and misclassification may be the rationale (Schultz et al. 2008, 2013).
9. Clinical practice guidelines for occupational injury have been generated almost entirely by researchers in North America, Australia, and Europe (Koes et al. 2010). The biopsychosocial model of pain and disability is rooted on European philosophies (Schultz et al. 2000) and has been validated primarily in patients of mainstream Western culture (e.g., Fedoroff et al. 2014). To date, there is no strong evidence indicating that these psychosocial practice guidelines are applicable and appropriate to all cultural groups.

In this context, the main tenets of the early intervention guidelines may be difficult for compensation systems to fulfill. Notably, they require the worker's active participation, a coordinated approach by all stakeholders, identification of workers at risk for disability during the subacute stage, and setting up interdisciplinary case management teams interacting with the worker, primary care physician, employer, and clinicians involved in physical restoration and activation. A working alliance must be established between the compensation system-based case management team in order for the intervention to be effective. Yet, the medicolegal and malingering detection focus, being a component of the traditional culture of such organizations, detracts from establishing such working relationships and often contributes to chronicity.

Only in an environment that actually promotes a worker's motivation to recover and return to work are the guidelines for early intervention likely to be successfully implemented. Supporting this are collaborative efforts such as the Health and Work Productivity (HWP), a web-based initiative where stakeholders are to pool knowledge (see chapter by White et al. 2015). Only in such a context can reassurance and reduction of worker's fears related to pain and work be accomplished. Only in this type of situation can practical goals for change and a focus on the barriers to return to work and problem areas be identified and worked on, with the active participation of the worker, employer, and the health-care practitioners in an integrative clinical and occupational approach. As a result, promotion of function, physical activation, and job accommodation/modification will more likely be successfully pursued and addressed.

13.7 Conclusions

The guidelines proposed in this chapter are of a "working" and "living" variety, as opposed to a fixed record of recommendations based on current knowledge. As more knowledge develops, these guidelines will require constant revisions, updates, and overhauls.

The state of knowledge in early intervention research in musculoskeletal pain disability currently does not allow for development of evidence-validated or even evidence-supported recommendations in all pertinent areas. Specifically, still more research is needed at the systemic and organizational level as organizational and job factors are predictive of disability (Loisel et al. 2001a; White et al. 2013). Also, more randomized controlled trials of interventions conducted with compensated workers are needed due to the uniqueness of this population and the context in which disability occurs. Different algorithms and predictive, evidence-based actuarial formulas need to be developed and applied with workers at the subacute stage after musculoskeletal injury to identify those who are at high risk for disability. Various outcome variables which operationalize disability in different ways, such as return to work, duration of disability, compensation, and healthcare utilization and costs, should be defined, standardized, and explored to establish the effectiveness and cost-effectiveness of early risk identification and early intervention. Appropriate predictive and intervention models should be selected and investigated for different purposes as no single model fits all applications.

Multi-stakeholder interaction and integration of clinical and occupation intervention approaches appear to be the most challenging component of the guidelines from the implementation perspective. Benefit would likely arise from conducting exploratory, qualitative research to develop conceptual models, which are currently limited. Traditional, individual-oriented clinical research needs to be expanded to encompass the knowledge of systems, from organizational psychology and organizational behavior perspectives.

The cognitive behavioral approach found to be most promising in early intervention will need to continue its expansion from the clinical laboratory and its application by psychologists to wide-range case management applications with workers at risk for disability. Any, or almost any, dimension of early intervention can be conceptualized and operationalized as aiming at a change of cognitions: workers' expectations of recovery and return to work; perceptions and beliefs regarding disability, rehabilitation, and job/employment threats posed by their injury; and the perceptions of employer's and compensation system's reactions to the worker's injury (Schultz et al. 2002, 2004). At the same time, changes in employer's beliefs, perceptions, and attitudes toward the workers and changes in the compensation system's beliefs, perceptions, and attitudes are likely to contribute to a successful outcome as well. Pransky (2007) also affirmed that the translation of research into practice is another critical component: "finding employers and practitioners who are implementing these principles are consistently achieving very good results, but there are few of them" (p. 250).

The methodological issues related to the standardization of interventions face an inherent conflict. On the one hand, clinician-led interventions focused on an individual have traditionally achieved the highest levels of standardization, albeit with difficulties. On the other hand, multimodel, multisystem, and multidisciplinary interventions hold the most promise in early intervention research. Yet, these types of complex interventions are the most difficult to standardize.

Due to the paucity of RCTs in early intervention research, particularly with compensated workers, the limited scope of valid evidence, and research generalizability problems, the guidelines presented in this chapter can be best called "evidence informed" as opposed to "validated" or even "supported." They constitute a direction to move at a time while more research is undertaken.

Another area of need in the literature is research evidence on the implications and complexities due to cultural diversity. Current practice guidelines on low back pain are largely silent in terms of the considerations that clinicians need to take when providing care for low back pain patients of various cultural backgrounds. This issue is relevant to the development and delivery of effective therapy, given research suggesting that the experience of and response to pain are culturally influenced (Hsieh et al. 2010; Rahim-Williams et al. 2012; Weiner and Nordin 2010). A growing body of research suggests that having a shared understanding about pain and treatment decision-making between practitioner and patient would lead to greater treatment adherence and patient satisfaction (Loh et al. 2007; Nijs et al. 2013; Weinstein et al. 2007). Further research efforts that can increase the practitioners' knowledge about the cultural nuances in patients' understanding of and preferences in coping with occupational injuries are likely invaluable. Finally, the findings that different ethnic groups show differences in their level of access of medical services following an occupational injury, their satisfaction with the care received, and their functional outcomes after multidisciplinary treatment (e.g., Chibnall and Tait 2005; Hooten et al.

2012) call for additional investigations into the factors underlying these differences. Ultimately, a greater understanding of cultural factors in occupational injury and rehabilitation would lead to a more useful set of practice guidelines for clinicians.

Last but not least, evidence is clearly ready to mobilize early intervention practice in the area of pain, especially in occupational musculoskeletal pain. Early intervention research in the field of mental health disorders is also emerging. Cross-diagnostic approaches to understanding both common factors empirically predictive of disability and early intervention approaches targeting modifiable predictive factors are promising (White et al. 2013, 2015), but not consistently ready for implementation.

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14 Workplace Intervention Research: Disability Prevention, Disability Management, and Work Productivity

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14.1 Introduction

In this chapter, we review the state of research and practice in workplace interventions addressing the continuum of disability prevention and management. We begin by highlighting the importance of intervention research. This is followed by a discussion of the gap that exists between research and workplace practice. There are many stakeholders who play a role in the prevention and management of workers at risk for disability, including corporate and labor leadership, supervisors and managers, human resource professionals, occupational health and safety professionals, wellness and disability management coordinators, health professionals, public and private insurers, claims managers, claims adjudicators, national or provincial health bodies, and workers. We argue that to create change and increase utilization of the best evidence in disability management practice, it is necessary to develop effective communication tools that encourage information sharing among stakeholders in a complex system. In an initial step toward closing the research-to-practice gap, we then summarize the results of two recent stakeholder-centered, best-evidence syntheses. The first synthesis identifies modifiable worker and workplace factors that increase the risk of work absence across health conditions. The second synthesis assesses the state of research on interventions that target the risk factors identified

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in the first synthesis. The quality and results of the intervention research are summarized to help employers determine which interventions are most likely to decrease absence, improve performance, or show some financial benefit. We conclude with recommendations to enhance the relevance and utilization of research evidence to inform policy, training, and practice.

14.2 Why Is Workplace Intervention Research Important?

A growing body of literature looking at the intersection between employee health and business health exists. Public and private sector employers face challenges related to an aging population, shortages of workers across many sectors, increasing disability costs associated with work absenteeism/presenteeism, and a rising prevalence of chronic disease in the population (Guzman et al. 2008; Health Council of Canada 2007; Lim et al. 2008; Prins 2013; White et al. 2007). A survey conducted by Watson Wyatt (2007) reports that managers estimate health and productivity costs for large employers which account for 20–25 % of organizational payroll. These costs include medical coverage, short-term and long-term disability, sick leave, workers' compensation, overtime, and costs related to replacing absent workers.

Business health is more than merely an engine for creating and maintaining individual and societal wealth. At the population level, business health and healthy workplaces are recognized as key social determinants of overall health. To elucidate this point, Gunderson stated:

> The link between workplace practices and productivity is important for all stakeholders—employers, employees and governments. For employers productivity is crucial for competitive survival under global competition. For employees it is important for job security and sustained real wage growth. For governments enhanced productivity is important for sustainable growth, reduced unemployment, tax revenue generation, and for providing the means for a social safety net and social programs in general…There is also growing recognition of the link between workplace issues and broader issues of health and well-being. (p. 2 2002)

At the macro-system level, there is increased understanding that issues concerning disability prevention, disability management, and return to work reflect the diversity of sociocultural, compensation systems, and other normative factors within a given society. Sickness absence rates vary considerably both within and across countries. The Organisation for Economic Co-operation and Development (OECD) has estimated that absence from work varies between 1 and 7 % of total working time worldwide (Prins 2013). Variability in estimates can be explained by individual, organizational, and societal factors of influence. For example, at the organizational and societal level, sickness absence and disability rates are highly influenced by social policies and benefit practices, including duration of benefit payment, job protection rules, and employer dismissal policies (Prins 2013). At an individual level, the highest disability rates are found among persons with lower education and those living in the poorest conditions. In most countries, higher rates are found in women (attributed to their increased household responsibilities and childbearing role), in older age groups (attributed to increases in chronic disease and illness), and those working in public administrative and manufacturing sectors. Sickness absence also increases with seniority (attributed to increased job responsibilities, greater job latitude, or higher levels of stress) (OECD 2011; Prins 2013).

In addition to individual, organizational, and societal contributors, overarching international trends in health and disease can impact disability outcomes at all levels. Specifically, Prins (2013) noted that international public health trends have shifted away from infectious diseases and toward chronic diseases. In developed countries, there has also been a shift from musculoskeletal disorders to mental health conditions. Based on current trends, it is expected that public health issues related to obesity, diabetes, mental health disorders, cancer, cardiovascular disease, and respiratory illnesses will have a profound effect on work disability (World Health Organization and World Bank 2011).

Preventing unnecessary work disability due to chronic disease is therefore an important goal for society, employers, and employees. At the organizational level, workplace intervention is one of many avenues for attempting to meet this goal. From an occupational health perspective, the purpose of well-designed workplace intervention research is to inform decision-making in the prevention and management of disability in the workplace. Over the past decade, there has been a growing body of primary research studies and systematic reviews identifying factors contributing to work disability. For workplace intervention research to be effective, there is a need to build stronger linkages between what is known from high-quality research regarding modifiable worker and workplace factors contributing to disability and interventions designed to prevent or mitigate disability.

Workplace intervention research should foster evidence-informed judgments about which interventions are more or less successful in preventing or mitigating work disability and/or contributing to work productivity. Additionally, such research should help guide decisions related to very important questions of intervention costs and related asset allocation.

14.3 The Research-to-Practice Gap: A Stakeholder Perspective

Effective worksite prevention and treatment efforts minimize injury risk, loss of income, and risk of reinjury and may also increase worker satisfaction, minimize disruptions in production, reduce worker compensation insurance premiums or litigation, and mitigate unnecessary disruption in work participation (Workplace Safety and Prevention Services 2011). By coordinating and improving the effectiveness of these interventions, stakeholders can have a direct or indirect influence on the prevention of occupational injury, mitigate the impact of chronic disease, and improve the timing of return to work (RTW).

Research and consultation have shown that many stakeholders are seeking relevant and credible knowledge, tools, and resources to prevent or reduce disability (Franche et al. 2005a; Frank and Cullen 2006; Frank et al. 1998; Guzman et al. 2008; Loisel et al. 2005a, b; White et al. 2004; 2007). Guzman et al. (2008) suggested that (1) employers would like to prevent or mitigate costs associated with absenteeism, presenteeism, and workers' compensation insurance premiums, (2) insurers would like to reduce risk and payouts for direct and indirect medical and personal liability, and (3) governments and health-care organizations seek quality assurance and greater accountability for services rendered. All stakeholders, including the worker, employer, government, and disability insurers, share the benefits of preventing injury and effectively managing the treatment of workers with injuries.

As discussed above, both external and internal influences impact the workplace setting and worker health. External factors include population and health trends, legislation, compensation and insurance policies, sociocultural factors, social norms, treatment norms, and the state of the economy. Internal or work setting influences include such areas as corporate culture, mission and goals, the workforce, work and related hazards, and resources, both human and operational (Rogers 1994). Each of these factors conspires to reduce the ease of knowledge translation regarding best practice for disability prevention and management. Although there are rigorous systematic reviews demonstrating that workplace absences, injuries, and associated disabilities are often preventable, there are many challenges to effective identification and dissemination of such information to stakeholders who participate in disability prevention and management (Arthur and Jelf 1999; Barling et al. 2003; Frank et al. 1996; Franche et al. 2005b; Frank et al. 2006; Guzman et al. 2008; Loisel et al. 2005b; White et al. 2004, 2007). To help illustrate these challenges, Fig. 14.1 shows the stakeholders involved in disability prevention and management in North American context and highlights the regulatory and sociocultural factors that increase the complexity of intervention coordination and information exchange.

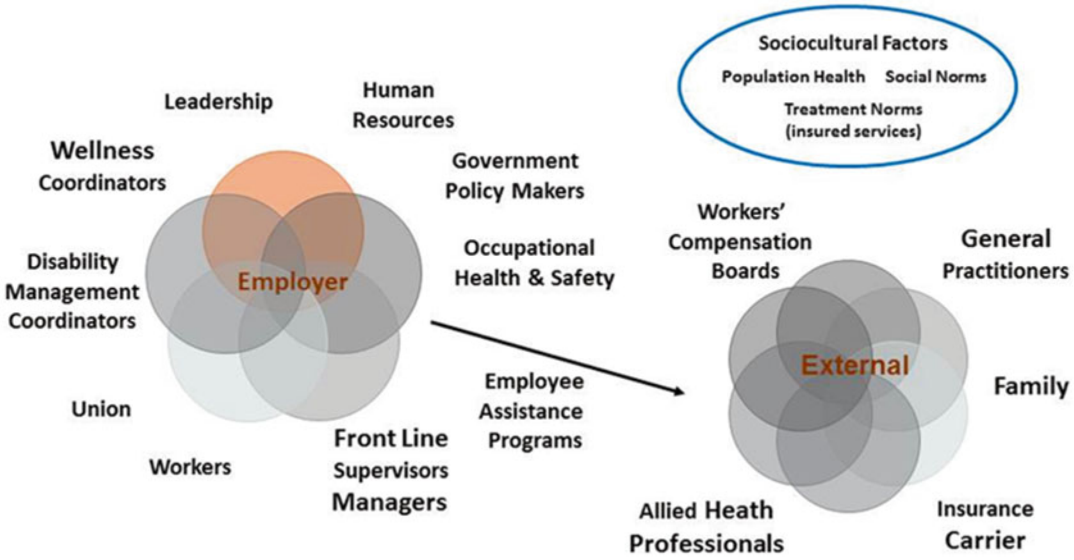

Fig. 14.1 Stakeholders involved in disability prevention and management. Continuum in Canada

Creating stakeholder change becomes difficult in light of the multiple internal and external factors that can influence success. For example, many challenges with workplace accommodation and rehabilitation programs stem from inadequate access to evidence-informed medical or health services, misalignment of compensation board initiatives, and failure to address nonwork-related stressors.

Although stakeholders are interested in using research evidence to inform policy and practice, much of the literature is not easily accessible, and stakeholders state that they require assistance in making informed judgments about its scientific merit, its relevance, as well as guidance on implementation of the acquired knowledge (White et al. 2007). Current approaches leave managers with guesswork around the areas of job suitability, appropriate accommodation timelines, how to progress a rehabilitation plan, and what to do with an employee's rehabilitation that is regressing. Stakeholders are seeking guidance about which intervention programs are most successful and will produce a return on investment with positive impacts on work absence, safety culture, and/or productivity.

In addition to the gaps in current knowledge synthesis from the perspective of stakeholders, other internal complexities are evident from within the research community itself. Specifically, workplace intervention research is conducted independently by professors, graduate students, researchers associated with academic or private research centers, contracted program evaluators, service providers, or employer in-house staff which may be linked to funding opportunities or specific interests. There is no coordinated or systematic approach to the identification of high-priority stakeholder needs or processes in place to map out a research agenda to address such needs. As a result, available primary research or synthesized research is more likely influenced by the specific interests of researchers or funders rather than of the stakeholders.

Improved communication and collaboration of researchers and stakeholders in defining the research agenda and participating in the research process may result in improvements in research relevance, its translation across different players who have a role in disability prevention and management, and its uptake and future evaluation.

This research-to-practice and practice-to-research knowledge gap also impacts environments external to the workplace including rehabilitation support groups, nonprofit societies, and the social milieu of the injured worker (family, friends, coworkers, and significant others).

14.4 Toward Closing the Gap: A Review of the Best Evidence in Workplace-Based Interventions

This section of our chapter summarizes the results of two recent stakeholder-centered best-evidence syntheses of systematic reviews undertaken. The first sought to identify risk factors for work absence across health conditions and populations and the second to evaluate workplace interventions that impact the risk factors identified. A common problem with workplace intervention research is that the literature is, for the most part, heterogeneous in nature and precludes the use of meta-analysis as a primary method of evaluation. Effect size and/or assessment of variance cannot be calculated across reviews given the different outcome factors, types of studies, and level of reporting. Best-evidence synthesis was therefore chosen to be the main method of critical appraisal (Carroll et al. 2008; Slavin 1995). Best-evidence synthesis bases analysis on three characteristics of evaluation: quality, quantity, and consistency of available evidence (Franche et al. 2005b). The terms strong, moderate, and weak are not indicative of the degree to which a given factor will influence the workplace; rather, they reflect the quality, quantity, and consistency of evidence for each respective factor across systematic reviews. Methodological screening of systematic reviews was undertaken by two independent reviewers using a modified Glasgow checklist screen to evaluate the comprehensiveness of the search performed (number of databases searched, adequacy of search terms, methods used to assess the quality of primary studies, the synthesis process, and whether the findings were segmented by strength of evidence). The complete description of methods can be found in the original publications (Franche et al. 2005b; Wagner et al. 2014; White et al. 2013).

Using data collected from systematic reviews as the lens for this chapter presents some strengths and limitations. The strength of using systematic reviews is the opportunity to look at a broad base of literature. This breadth of approach enables informed judgments regarding what is known or not known, taking into account the quality of available primary studies. Such reviews also provide an opportunity to reflect on the relevance and utilization of what is known from credible high-quality research and what is done in policy, training, and practice. The main limitation of using only systematic reviews, rather than primary studies, is the loss of contextual information about the original research. This issue limits the ability to provide a richer understanding about what was done, how it was done, and about the work environment in which the research took place.

14.4.1 Best-Evidence Synthesis: Modifiable Risk Factors

The purpose of the initial best-evidence synthesis we conducted was to identify modifiable risk factors for absence across health conditions (Wagner et al. 2014; White et al. 2013). We provide a brief summary here to provide pertinent background for the second synthesis, which assesses workplace interventions that attempt to modify the risk factors found in this first study. Table 14.1 provides the list of modifiable *workplace* factors that contribute to absenteeism. Lack of social support, job strain, physically demanding work, low job satisfaction, lack of supervisory support, high psychological demands, and lack of worker control were found to have the most consistent relationship with absenteeism across studies, regardless of the nature of the disability.[1]

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[1] It is important to note that the terms used in these tables: strong, moderate, weak, inconclusive, and conflicting reflect the consistency of results across health conditions, not the strength or effect size of a respective risk factor.

Table 14.1 Workplace risk factors contributing to work absence

Strong	Moderate	Weak	Insufficient	Inconsistent
Lack of social support Job strain Increased physical demands Low job satisfaction Lack of supervisory support Increased psychological demands Lack of worker control	Non-full-time work Poor quality leadership Lack of job control Lack of fairness Lack of managerial involvement	Increased absenteeism tolerance Reorganizational stress Increased time to treatment	Workplace physical environment Job stress Staff training Goodwill in workplace Union involvement Health systems factors Employer barriers Workplace staffing Treatment Communication	Compensation and insurance level

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Table 14.2 Worker risk factors contributing to work absence

Strong	Moderate	Weak	Insufficient
Emotional distress and increased depressive symptoms Negative enduring psychological factors (e.g., neuroticism) Negative health and disability perception/negative recovery expectations Decreased physical activity Lack of family support Poor general health Increased functional disability factors Increased pain Increased fatigue Lack of motivation to return to work	Sleep difficulties Substance use	Lack of, or poor planned, nonwork physical activity	Fiber intake Experience of violence Increased health concerns Psychosomatic health concerns Absence duration Injury at work Work unit separation Compassionate leave Lesser duration of employment Transportation access Positive role models

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Table 14.2 provides the list of worker factors (some modifiable, some less so) that contribute to absenteeism. Emotional distress, poor general health, pain, and fatigue were among the factors found to have the most consistent relationship with absenteeism.

14.4.2 Best-Evidence Synthesis: Intervention Effectiveness

The second best-evidence synthesis we conducted evaluated workplace-based interventions intended to modify the risk factors found in the first synthesis. Workplace interventions are defined as purposeful programs that (1) occur at the workplace (rather than in a medical facility or in the community) or (2) those offered to workers as part of the employers' benefit package through contracted services or (3) those primarily directed by researchers with the permission and participation of employers, for the purpose of making a change to current practice.

Workplace interventions may involve the physical environment, such as climate adjustment, equipment design, or physical plant design. They can address the design of work, including demand levels, task rotation, training, communication, workplace relationships, and the degree of control the employee has over task completion. Financial and employment contract interventions can also be implemented in an attempt to influence disability prevention and return to work through compensation and benefit policies, safety incentives, and performance rewards. Finally, interventions can include broader organizational arrangements and stakeholder relations with policies and procedures for disability case management, occupational health services, and systems of coordination, control, and accountability across multiple stakeholders.

We found 46 quantitative systematic reviews that evaluated the effectiveness of interventions addressing disability risk factors on outcomes of interest. The reviews were analyzed to evaluate the quality and quantity of evidence regarding the relationship between the interventions and their impact on work absence, work productivity, or financial outcomes. It should be noted that our synthesis assessed the impact of these interventions on work-related outcomes only and not clinical outcomes. Therefore, conclusions should not be drawn regarding the effectiveness of the interventions with regard to clinical outcomes, such as disease management or reduction of clinical signs and symptoms.

Below are the preliminary results of the synthesis, summarizing the impact of the interventions on work absence, productivity/performance, and financial outcomes. We begin with an overview, followed by additional detail for each intervention type. The majority of the studies included in the reviews were focused on education programs, followed by health risk assessment programs, and physical activity interventions. Most interventions had multiple components. Table 14.3 provides an overview of the intervention types included in the systematic reviews. Each systematic review included between two and 30 individual studies that assessed at least one of the outcomes of interest for our synthesis. Overall, information from more than 300 individual studies is summarized below.

In several cases, the same review addressed more than one of the intervention types listed; therefore, the cumulative sum is greater than the total number of reviews included. In cases where there were 12 or higher quality reviews, our synthesis considered findings only from these reviews.

Table 14.3 Number of systematic reviews by intervention type

Intervention type	No of reviews	No of high-quality reviews
Social support interventions	4	4
Supervisory interventions	3	2
Job demand interventions	10	8
Job control interventions	3	1
Mental health interventions	14	14
Exercise interventions	20	18
Workplace policy and wellness interventions	19	13

1. *Social support interventions*: The evidence suggesting that social support interventions effectively reduce absenteeism and disability duration and also improve employee work performance is strong. Social support interventions included efforts on the part of the employer to collaborate with the worker during the return to work process (Carroll et al. 2010), assistance navigating disability management systems (Pomaki et al. 2012), offers of work accommodation, early contact with the worker, and the presence of a return to work coordinator (Franche et al. 2005b). Once the employee has returned to work, the evidence indicated that higher levels of social support are associated with better business outcomes (Aas et al. 2011). Franche et al. (2005b) also found that there is moderate evidence that social support interventions reduce disability costs.
2. *Supervisory support interventions*: As noted in the first best-evidence synthesis conducted by White et al. (2013) above, the support of an employee's supervisor is an important factor affecting absenteeism across a multitude of health conditions. In the second synthesis, reviews of research assessing interventions intended to improve supervisory quality were identified. They suggest that there is a moder-

ate level of evidence that supervisory interventions can have positive effects on absenteeism (Franche et al. 2005b) and presenteeism (Cancelliere et al. 2011). An example of a supervisory intervention intended to increase support for workers with disabilities is an education program regarding mental health promotion (Cancelliere et al. 2011). No particular leadership style or attribute has yet been found that definitively impacts workplace outcomes (Pearson et al. 2007).

3. *Job demand interventions*: Interventions that reduce the physical demands of a job or job-related stress and strain are well researched. They include work modifications and accommodations, such as added rest breaks, work redesign, ergonomic adjustments, or changes to the physical environment. Overall, the evidence strongly indicates that reduced job demands for employees returning to work (rather than those already at work) with musculoskeletal pain are an effective way to improve RTW, sick leave, absence, and financial outcomes. There are fewer studies that assess the impact of reduced demands on returning employee performance or productivity. When the interventions are targeted at general workers (those already at work with or without a disability), the level of evidence is moderate with respect to absenteeism and sick leave, limited to moderate for productivity/performance, and limited to moderate for financial benefit. Complex interventions (those with three or more different components) appear to be more effective than interventions that have only one component (Lamontagne et al. 2007). An example of a complex intervention would be a program that consisted of additional rest breaks and ergonomic adjustments, in addition to an exercise or education program.
4. *Job control interventions*: There is less research assessing interventions that are designed to increase employee control over work than research assessing interventions designed to reduce job demands. Often both job demands and worker control are assessed in the same study, and all three of the reviews located for best-evidence synthesis targeted general workers rather than workers with disabilities. The evidence suggesting that increased job control results in lower levels of absenteeism or sick leave is moderate. In the highest quality review (Lamontagne et al. 2007), the authors found that 12 of 15 studies showed positive effects for a complex intervention designed to increase worker participation or decision-making. Studies that assess the impact of job control on productivity outcomes also provide a moderate level of evidence of a positive effect. However, there is insufficient evidence to assess the financial impacts.
5. *Mental health interventions*: Mental health interventions included high-intensity cognitive behavior therapies and/or lower intensity education, problem-solving and coping sessions. The majority of reviews (10 out of 14) showed a positive effect on one or more work outcomes (absenteeism, productivity, or financial outcomes), while four found no effect or insufficient research on the outcomes of interest. For instance, Pomaki et al. (2012) found that both high and low intensity therapies were beneficial for economic outcomes, with higher intensity interventions appearing to be more beneficial for productivity and performance. However, low intensity psychological interventions were shown to have no effect on productivity, and neither high nor low intensity interventions demonstrated a benefit in reducing sickness absence (Pomaki et al. 2012). Palmer et al. (2012) found that behavioral and cognitive interventions reduced absenteeism and prevented job loss. Other beneficial workplace programs included interventions such as worksite in vivo treatment for anxiety (Noordik et al. 2010), cognitive behavioral therapy (Corbiere and Shen 2006), cognitive behavioral therapy for women only (Carroll et al. 2010), and multidisciplinary rehabilitation programs (Dick et al. 2011). Three reviews found evidence of no effect of the interventions studied on organizational outcomes (van der Klink et al. 2001; Aas et al. 2011; Tveito et al. 2004). Additionally, a

number of reviews stated that the research was too limited to draw conclusions about psychological interventions on work outcomes, recommending further research with a focus on standardizing interventions and outcomes to provide an adequate evidence base (Czabala et al. 2011; Furlan et al. 2012; Richardson and Rothstein 2008).

6. *Exercise interventions*: There were 18 high-quality systematic reviews assessing the impact of physical fitness or exercise interventions. Eleven of the 18 reviews investigated programs that targeted general workers rather than workers with disabilities. Sixteen of the reviews assessed absence, four assessed productivity, and six assessed financial impacts. The quality of the evidence is generally inconclusive or of low to moderate quality. The strongest evidence supports the use of short, simple exercise or fitness programs. These types of programs may be beneficial for both general workers and those with disabilities. Short simple exercise/fitness programs seem to provide similar benefits to those using more complex interventions for general workers that include exercise/fitness. For workers off work at baseline with subacute low back pain, evidence exists that some complex physical fitness/exercise may be more effective than simple physical fitness/exercise interventions, especially interventions that involve workplace stakeholder engagement, communication, and coordination. The main concern is that few comprehensive, high-quality randomized controlled trials exist with similar definitions, methods, and measures which makes it difficult to draw strong conclusions.
7. *Workplace policy and wellness interventions*: There were 13 high-quality reviews assessing interventions that targeted workplace policies or workplace wellness. Examples of simple workplace policy interventions include early contact with disabled workers, assistance navigating disability management systems, or shift schedule changes.

Complex wellness interventions normally target general workers rather than those off work due to an illness or injury. The goal of these programs is to identify and reduce disability risk factors within the work population by promoting healthy behaviors. They are often multicomponent programs that include health risk assessment screening, education programs, and ongoing support for healthy behaviors. For example, one recent systematic review (Soler et al. 2010) compared the difference between the assessment of health risks with feedback (AHRF) versus multicomponent programs (AHRF Plus). The AHRF studies analyzed included three components: (1) the collection of information of a minimum of two or more personal health behaviors or indicators, (2) the translation of the information collected into one or more individual risk scores or categorical descriptions of risk status, and (3) the provision of feedback to the participant regarding their risk status, either overall or with respect to specific risk behaviors. AHRF Plus programs combined the screening and feedback with additional health-related interventions provided by employers at the workplace. These included health education, enhanced access to physical activity, nutritious food alternatives, medical care, or policy interventions like smoking bans or restrictions and incentive programs to encourage desired behavior. Soler et al. (2010) concluded that AHRF Plus is more effective than AHRF alone. Their review suggested that an annual gain of $1.40 to $4.60 per dollar invested into the program could be realized.

Overall, the evidence supporting these types of interventions is moderate to strong. The strongest evidence indicates that complex, multimodal worksite health promotion programs can have a positive effect on absenteeism, work performance, and financial outcomes. In contrast, the impact of simple interventions is quite variable and dependent on the nature of the intervention itself. For example, the level of evidence that assistance navigating disability management systems and early contact with workers who become disabled will decrease time off work is strong (Franche et al. 2005b; Pomaki et al. 2012). However, the evidence that a compressed workweek will reduce absenteeism among shift workers is inconsistent (Bambra et al. 2008).

14.4.3 Stakeholders' Primary Concerns

In the course of developing our program of research, our stakeholder partners had two primary concerns. First, they were interested in understanding what is known from high-quality research about what risk factors were predictive of work absence across health conditions, and second, they were interested in learning about the effectiveness of workplace interventions that prevent or mitigate these factors. They were aware that the peer-reviewed scientific literature spoke to these issues, though they needed assistance to access, evaluate, and interpret the available evidence. As a result, our research group (academic researchers and stakeholders) created two separate syntheses of systematic reviews. The first synthesis identified risk factors that more consistently predicted or was associated with workplace absence across health conditions. The second synthesis identified and evaluated workplace interventions on three outcomes of interest—work absence, productivity/performance, or financial outcomes.

14.5 Recommendations to Employers and Other Workplace Partners

According to our findings, several recommendations can be provided to employers and other workplace partners. Specifically, employers interested in planning, implementing, or evaluating workplace interventions should consider the relevance of known modifiable risk factors that are predictive or associated with work absence. From our synthesis, these factors included a lack of social support, job strain, increased physical demands, low job satisfaction, lack of supervisory support, increased psychological demands, and worker control over job tasks. Related to these risk factors, the findings of our subsequent intervention synthesis suggested that employers should consider implementing social support interventions such as early contact with the worker accompanied by supportive return to work efforts, assistance with the disability management processes, and offers of work accommodations. With respect to job control and demands, employers should consider increased worker control and, when returning an employee to work, reducing or altering job demands commensurate with the abilities of the worker. Further, other interventions that demonstrated to be of benefit included increased quality and availability of supervisory support as well as short and simple exercise or fitness programs. Although the literature did not support the use of any particular supervisory or leadership style, there was support for increased quality of supervision as a positive intervention toward improved workplace factors. Similarly, the literature did not provide evidence for superiority of any particular exercise program. However, evidence did support keeping any type of exercise program or initiative easy to manage in terms of time and level of knowledge.

These findings are congruent with and extend the Institute for Work and Health's (IWH) principles for successful return to work (IWH 2007). IWH recommended (1) the training and involvement of supervisors in work disability prevention and RTW planning, (2) the need for employers to make an early and considerate contact with injured/ill workers, (3) the employer to make an offer of meaningful work accommodation, (4) that the RTW plan supports the returning worker without disadvantaging coworkers and supervisors, (5) that someone has the responsibility to coordinate RTW, (6) the need for employers and health-care providers to communicate with each other about the workplace demands as needed and with the worker's consent, and (7) that the workplace demonstrate, by the policies and behaviors of the workplace partners, that it has a strong commitment to health and safety. Our research suggests that employers should consider increased worker control and job flexibility as potential targets when planning health promotion and RTW interventions for both workers at work with health conditions and those returning to work (Williams-Whitt et al. 2015).

Our findings indicate that it may be beneficial for employers to implement mental health interventions, particularly for employees whose disability has led to taking time off work. All systematic reviews that investigated psychological interventions for the off work population reported positive results on one or more of our outcomes of interest. It should be noted that although the level of evidence was deemed to be limited (trending on moderate), this was due in part to the fact that half of the systematic reviews did not quantify the level of evidence, which in turn affected how the overall level of evidence was assigned in our review. Cognitive behavioral interventions, and interventions comprised of behavioral components, appear to yield the most consistent results. In comparison, the effect of mental health interventions on employees at work appears to be more mixed. At this point, we are hesitant to form firm recommendations regarding mental health interventions due to the limited amount of research, the lack of standardization of outcome measures, and the tendency for primary research to focus on clinical improvements rather than work-related outcomes. However, it is our expectation that as more valid and meaningful research becomes available, clearer recommendations will become evident for mental health interventions.

A common challenge facing evaluation of health promotion programs is the lack of independence between the provider of the services and the evaluator. Creating evaluation funding partnership programs with government agencies and industry may strengthen evaluation frameworks and reporting as well as mitigate potential bias.

14.6 Research Gaps and Recommendations

We attempted to answer stakeholders' questions about the risk factors most linked to disability across health conditions as well as the interventions most helpful in addressing these factors. From our viewpoint, we provided some initial answers to these questions, but much work is yet to be done. An important finding of our synthesis is the need for more high-quality research on promising interventions and guidance on appropriate outcomes. In particular, there is a need for research that assesses the effectiveness of workplace-based mental health interventions, changes to job control, and further evaluation of exercise interventions of short duration, less than 20 min (e.g., stair walking or "buddy-type" runs during regular breaks) and their impact on those at higher risk for disability. It also appears that there are both some similarities and differences in treatment effectiveness when treatments are applied to workers who have been off work due to disability and those who are at work (disabled or not). Where applicable, interventions should be investigated across the continuum of disability prevention and management. Finally, we found some challenges that are artifacts of an underdeveloped field of research. Definitions, survey instruments, and other measures were inconsistent across studies, making it more difficult to draw clear conclusions. Researchers in collaboration with employers and other stakeholders should work toward developing common definitions, protocols, and outcome measures, relevant for both academic research and applied research.

14.7 Future Directions

Creative and effective methods of increasing knowledge mobilization around work disability prevention are required. For example, the two best-evidence syntheses projects discussed above arose from the development and pilot testing of an online academic stakeholder collaborative portal called the Health and Work Productivity (HWP) portal (www.healthandworkproductivity.org). The HWP portal is designed to assist stakeholders including human resources, occupational health and safety, public and private insurers, health professionals, policy-makers, and business/labor practitioners, and those involved in the continuum of education (undergraduate, graduate, and continuing professional education) identify and utilize credible research and related resources to inform training and practice. Academic and stakeholder partners are invited to participate in knowledge translation and utilization through the HWP portal.

However, more knowledge exchange initiatives are required. We encourage the development of similar online disability information portals that are regularly updated and accessible to all RTW stakeholders. Conferences that invite interaction between researchers and the practitioner community would stimulate knowledge translation, exchange, and collaboration. There are a number of existing models in other fields that combine these methods and could be applied to disability prevention and management. For example, stakeholders could be regularly updated on important developments by subscribing to a service that combines online summaries of important research with email alerts, webinars, podcasts, audio conferences, and cross-country symposia. Postsecondary institutions also have an important role to play. Continuing education programs targeting supervisors and managers already in the workplace would be beneficial. The core curricula of business degree-granting programs should include courses that focus on managing employee health, particularly for students majoring in human resources and labor relations.

Stakeholders are still mandated to work on primary prevention strategies such as traditional safety programs and secondary prevention strategies, including disability management programs, in segregation, despite some emerging evidence that these programs work best in unison. Integrating primary and secondary prevention operations within the workplace may offer some opportunities for employers to change workplace culture, recognizing that organizational policies, practices, and behaviors of all parties must demonstrate their collective commitment to health and safety, as a prerequisite to facilitating RTW.

The information we provided is limited to the research literature available at the time of the review. Research information on disability risk and intervention is constantly being created, and, as a result, these types of overviews for the purpose of stakeholder application will need to be updated in order to provide the most recent information upon which to base workplace decisions. Regardless of the quality or currency of the data provided, the information is limited in its usefulness and impact by the degree to which stakeholders use it.

As the fields of disability management and vocational rehabilitation mature and advance, we hope to see researchers and practitioners working together to create strong, timely, and meaningful research evidentiary research base for workplace interventions that is pertinent and understandable for the purpose of direct application in the workplace.

14.8 Conclusion: A Stakeholder's Call to Action

Going forward, it will be important to develop common criteria that address the concerns of all stakeholders and the creation and utilization of evidence-informed audit and tracking protocols to ensure appropriate data is collected and programs are evaluated against the criteria developed.

Our academic stakeholder experience resonates with the conclusions of Frank et al. (2003):

> The best way to ensure that evidence-based interventions are used is to develop a partnership between those who produce research/evaluation knowledge and those who use it. In many cases, however, researchers and decision-makers are unable to understand each other's needs or even to communicate effectively…There are two critical junctures in the relationship between research producers/evaluators and decision-makers. The first occurs before the decision to implement a program or policy; the second critical period occurs after implementation, when the time comes to measure impact (p. 10).

It thus seems clear that we must work toward building relationships between those who do research and those who use this knowledge to design better targeted disability prevention programs and more effectively evaluate their impact to enhance our collective knowledge about preventing unnecessary work disability.

In this chapter, we have argued that there are many causes of disability at work and that in order to minimize the negative impact on the worker, the employer, and society as a whole, there must be better exchange of information

Main Practice Points for Stakeholders/ Employers

- Employers should consider implementing social support interventions such as early contact with the worker accompanied by supportive return to work efforts, assistance with the disability management processes, and offers of work accommodations.
- Employers should consider increased worker control and reducing or altering job demands commensurate with the abilities of the worker when returning an employee to work.
- Although the literature did not support the use of any particular supervisory or leadership style, there was support for increased quality of supervision as a positive intervention toward improved workplace factors.
- Short simple exercise/fitness programs seem to provide similar benefits to those using more complex interventions for general workers that include exercise/fitness; but evidence did support incorporating any type of exercise program or initiative that is easy to manage in terms of time and level of knowledge.
- Our findings indicate that it may be beneficial for employers to implement mental health interventions to improve work outcomes.

between researchers and stakeholders. It is necessary to understand those interventions that decrease the negative impact of disability as well as those that do not to increase the likelihood that investments in the workplace are well spent.

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Work Accommodations: A Social Perspective

15

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15.1 Introduction

Musculoskeletal (MSK) and mental health (MH) injuries are the most prevalent causes of disability worldwide and account for a large percentage of disability costs in the workplace. These "non-visible disabilities" often present the most challenging scenarios for employers, workers' compensation boards, and rehabilitation professionals due to their recurrent and/or episodic nature and potential to become chronic and costly. The prevalence of these conditions in the workplace is expected to increase and is considered an escalating concern in disability management. In addition, physical and psychosocial workplace conditions can exacerbate the problems with these disabilities (e.g., Ahlstrom et al. 2013; Dionne et al. 2013).

Historically, accommodations for individuals with non-visible disabilities were associated with the perception of high costs by employers or compensation systems, suspicion of symptom exaggeration or malingering, and attendant emphasis on potential fraud detection. Workers compensation boards were originally the main supporters of return to work (RTW) programs. Today, employers increasingly assume an active role to support workers to RTW with the goal of reducing the impact of work disability (see chapter by White et al. in this Handbook). These proactive employers develop, implement, and evaluate RTW programs and stay at work (SAW) initiatives. Notably, companies with established work disability prevention programs recognize that healthy and productive organizations create positive and productive work environments and benefit all workers, regardless of disability. Importantly, significant shifts in societal and employers' attitudes and practices for individuals with MSK injuries have occurred, although stigma and misconceptions remain prominent in the experiences of individuals with MH injuries (Baldwin and Marcus 2011; Schultz et al. 2011a).

For decades, MSK injuries have been the leading cause for disability; however, in recent years, prevalence has been in decline. MH injuries, conversely, have grown in prevalence and in some countries outnumber MSK injuries (Cornelius et al. 2011; Waddell 2006). Waddell (2006) suggested that changes in social security and compensation systems have created an increase in claim rates for more "common" health problems such as mild to moderate MH and MSK conditions. With respect to early identification and intervention for workers at risk for disability, a significant evolution in disability management approaches is linked with an improved

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recognition of the significant work disability costs when compared to simply accommodating a worker. Greater consensus on utilizing a biopsychosocial perspective on impairment and disability and increased recognition of the "epidemic" of non-visible occupational disabilities has resulted in increased research and activity in the field of RTW and work disability prevention. An increasing number of studies emphasize integrative approaches among disciplines and consider multiple system and multi-stakeholder perspectives (Ståhl et al. 2013). Research points to the importance of social aspects of workplace interactions during RTW interventions for persons with non-visible disabilities (Costa-Black 2013; Hoefsmit et al. 2012; Huijs et al. 2012; Smith et al. 2013; Sullivan et al. 2009).

Overall, significant gaps in employer awareness continue with respect to the work accommodations required by employees with non-visible disabilities to facilitate a successful RTW. This gap is most evident in MH conditions (Schultz et al. 2011a). Growing legal pressure to promote fairness in employment due to disability acts and human rights legislation in industrialized countries has lead to an increased pressure to produce evidence-informed clinical and occupational practice in work accommodations for persons with non-visible disabilities. Unfortunately, the existing research is inadequate and can create practices that are insufficiently evidence informed (Schultz et al. 2011d). Further, effectiveness research on workplace accommodation interventions is lacking despite extensive utilization of such interventions for people with workplace injuries. A growing need exists for the integration of MSK and MH occupational disability research as the focus on non-visible disabilities in the workplace expands (Loisel and Côté 2013; Waddell and Burton 2001). The integration of MSK and MHI research is necessary to identify common themes, inform future research, and recommend best clinical and occupational practices.

The aim of this chapter is to improve understanding on the current state of research and practice in work accommodations for MSK and MH injuries. The overlap and differences in research are also considered, and previous work accommodation writings in MSK disorders (Kwan and Schultz 2014) and organizational factors in work accommodations for MH injuries (Schultz et al. 2012) are integrated and updated. In addition, a model considering social interactions in work accommodations is proposed, based on the current MSK research.

15.2 Toward An Integrative Framework of Work Accommodations

Evidence-informed practice in work accommodations is still lacking for individuals with MSK disabilities, MH injuries, and all disabilities in general (Sanford and Milchus 2006; Schultz et al. 2011b, d). Despite the extensive body of research on occupational injuries, the RTW accommodation process has not garnered any published large-scale research studies distinguishing between the nuances and variations in the type, user group, rationale, and duration of accommodations. The process of accommodating a worker is often haphazard with a process of trial and error (Sanford and Milchus 2006). Many stakeholders, though invested in a safe and timely return to work of injured workers, are still unclear about how to translate research knowledge into practice. This is currently a significant challenge facing the RTW, work disability prevention, and disability management field.

The existing accommodation research is hampered by an abundance of terms, inconsistent use of terms and definitions, and methodological differences. For instance, the terms "workplace interventions," "work adjustments," "modified work," "job modifications," and "accommodations" are often overlapping, entangled concepts in the literature. There has been a broader conceptualization of accommodations in the last decade by the researchers and stakeholders. In this vein, the current chapter defines work accommodations as efforts to modify any aspect of a job or work environment so that the individual with a disability can accomplish the job tasks (Schultz et al. 2011b). These interventions can include accommodation aspects of the hiring process, the actual performance of the job, or the individual's ability to enjoy the full benefits of the job (US Equal Opportunity Commission 2002).

Although our chapter focuses on work accommodations in RTW, the field of research and practice overlaps with other workplace issues and interventions, such as disability prevention, disability management, and theories and models of occupational disability. Simply, work disability prevention and disability management may focus on preventative measures, whereas RTW is specifically aimed at reducing time off work once the injured worker is returning to the workplace. In essence, a successful RTW is a primary mechanism for decreasing the burden of work disability (Young 2013).

15.3 Types of Work Accommodations

The existing research on work accommodations can be classified into two broad categories: (1) an inclusion strategy for employees with long-term disabilities, often from nonwork-related injuries, into a new organization and position (Gates and Akabas 2011) and (2) an early intervention to facilitate the return to work of injured workers. Formerly, accommodations were primarily associated with inclusion strategies for individuals with disabilities to increase their work participation. Research in this field is now multidisciplinary, involving disability studies, human resource and management, occupational disability, physical and occupational therapy, ergonomics, and even architecture. In the first category, inclusion strategy accommodations or work integration accommodations may be extensive, involving transportation access and assistive technology. Workplace interventions for injured workers are regularly classified within the second category in the literature, which may confound research findings. Some of the MH research distinguishes "work participation" on a continuum from stay at work through return to work to, on the opposite end, work integration. The concept of "work functioning" is along a continuum from work productivity, through presenteeism and absenteeism from work, to long-term disability (Corbière et al. 2013; Lagerveld et al. 2010). As such, in both research and practice, work accommodations can be positioned at various points along this continuum.

15.3.1 Temporary/Permanent and Work/Nonwork-Related Accommodations

Some researchers have asserted that permanent and temporary modifications need to be distinguished in order to advance accommodation research (Durand et al. 2007). The terms "reoccurring" versus "one-time requests" for accommodations have also been used (Baldridge and Veiga 2006). Likewise, the terms "provisional work accommodations" and "workplace modifications" (permanent) have been applied (Costa-Black 2013). Much of the research to date does not consistently distinguish accommodations for work or nonwork-related injuries. There are indications of possible differences in the processes for these two types of accommodation requests. For example, Schartz and associates found that current employees who become disabled are more likely to receive workplace accommodations as compared to job applicants with disabilities entering the workforce and requesting accommodations (2006; see also Burkhauser et al. 2012). Furthermore, social processes may differ in accommodations with different rationales with respect to work or nonwork-related injuries (Cleveland et al. 1997). As well, in practice, some organizations may reserve modified duties or certain accommodations for individuals with workers' compensation claims as opposed to others on different types of sick leave.

Butterfield and Ramseur (2004) who reviewed accommodation types used in the workplace for work-related or nonwork-related disabilities found that short-term accommodations were commonly implemented, such as adjusting work schedules, adopting flexible leave policies, and restructuring jobs. The most common type of modified work or work accommodation was light duty, followed by flexible schedule, and reduced hours (Brooker et al. 2001; Krause et al. 1998). Specific to MH conditions, Schultz and her team found that employers were generally more familiar with communication- and interaction-oriented, management-based, job accommodations, such as open communication, positive reinforcement, and additional staff training (Schultz et al. 2011c). Employers were less familiar with structural, environmental, and organizational aspects of job accommodations that required multilevel support with the workplace and were more complicated to implement for individuals with MH disorders (Schultz et al. 2011a) and with relationship accommodations (Gates et al. 1998).

15.3.2 Conceptual Models of the Accommodation Process

Cleveland and colleagues and Baldridge and Veiga have each proposed an accommodation process model. Though well cited and commonly accepted, these models have yet to be empirically validated. Cleveland et al. (1997) considered the workplace's reaction to accommodation to be related to four major factors: (1) the rationale for the accommodation; (2) the nature of the accommodation; (3) whether the accommodation is organization, employee, or jointly initiated; and (4) the characteristics of the person being accommodated. The rationale for accommodation may include a legal mandate, social/moral obligation, or business consideration. Cleveland and colleagues (1997) described business considerations, changing workforce demographic characteristics, enhancing productivity and reward for performance as reasons and incentives for employers to implement accommodations. They asserted that accommodations are not limited to responses to individuals with disabilities and that organizations routinely use accommodations to compete for qualified individuals by adjusting work activities or the work environment. These accommodations are often labeled as extra benefits of the job. Notably, coworker responses may be a factor supervisors consider when deciding whether to grant an accommodation (Cleveland et al. 1997).

Baldridge and Veiga (2001) considered the workers' decision process to request accommodations and proposed that past responses to accommodation of group members influence the likelihood of future requests. An employee would request an accommodation based on its perceived usefulness, the appropriateness of seeking help, and the workplace accommodation culture (Baldridge and Veiga 2001). Organizational justice models have also been utilized to explain that the conditions of "fairness" or justice may be relevant to understanding employers and employees reactions to accommodations (Cleveland et al. 1997; Collela 2001). Two components of organizational justice are distributive justice and procedural justice. Distributive fairness refers to the perceived fairness of the outcome of a decision, e.g., how fair coworkers believe the accommodation is in terms of its effect on the distribution of rewards and resources (Cleveland et al. 1997). Procedural fairness is defined as the perceived fairness of the processes or procedures through which outcome decisions were made (Colella et al. 2004), e.g., the degree to which the process of granting an accommodation was fair (Cleveland et al. 1997). Collela (2001) proposed a model focused on coworker's perceptions of distributive fairness. They suggested that if the coworkers considered the accommodation salient and relevant, an evaluation of the distributive fairness of the accommodation based on rules of fairness and need would follow. Colella and associates (2004) further proposed that individual and organizational factors are likely to influence coworkers' procedural justice inferences.

15.3.3 Importance of Social Interactions

Work accommodations, especially those for workers with non-visible disabilities, are typically understood in research and practice as complex social interactional processes between multiple RTW stakeholders (including the active involvement of the worker). This perspective also involves the optimization of the match between the needs of the worker who has functional limitations and the demands and supports offered by the system that offers and facilitates work accommodations. The range of accommodations in MSK is diverse and not limited, as often conceived, to ergonomic solutions only. The research in the emerging field of accommodations has slowly developed and is methodologically lagging; areas of impact include other workplace and clinical interventions, especially effectiveness and outcomes of various accommodations, social context, and multiparty interactions involved in implementation and maintenance of accommodations. Generally, environmental and disability contexts that promote communication among all stakeholders are effective if the individuals involved exercise trust and establish credibility by following through with formalized programs (Franche et al. 2005a; Friesen et al. 2001; MacEachen et al. 2006).

15.3.4 Grounded Theory of Social Interactions in the Accommodation Process

Due to its multi-interactional and dynamic nature, the RTW process is laden with potential for miscommunication and misunderstanding regarding important social aspects of work accommodations. Few interventions, however, have been designed to target specific risk factors in social interactions, particularly with the increased practice of early RTW where the individual reenters the workplace before a full medical recovery. A study providing additional insight into these issues was conducted; it aimed to develop a grounded theory of the multisystem social interactions in the accommodation process for work-related MSK injuries. Here, Kwan (2013) identified that developing trust and balancing control are core, interdependent processes within interactions involving the key stakeholders of injured workers, employer representatives, and workers' compensation representatives. The middle-range theory developed from the qualitative data offered a conceptual framework to target risk factors in social interactions and provided six propositions for further testing. In this theory, the process of developing trust is further delineated into subcategories of communicating with stakeholders, examining trustworthiness, building relationships, and managing expectations. The process of balancing control is characterized by the subcategories of establishing guiding principles of interactions, managing risks, managing needs, and creating options. The key stakeholders described successful work accommodations along four criteria: returning the worker to productivity, satisfaction with work accommodations, reducing losses, and claim closure.

The findings identified trust and control as critical in the RTW accommodation process. Recommendations included considering these processes in designing and evaluating potentially effective accommodation interventions and developing a measure of trust for RTW. Various trust measures are currently available within the organizational sciences literature; however, development of instruments to measure trust and control for RTW professionals would allow for closer monitoring. This may include a short survey or questionnaire. The measurement of perceived trust in the RTW and accommodation process needs further investigation. Balancing control can support the development of sufficient levels of trust for collaboration and cooperation (Davis et al. 1997). Building positive working relationships was also possible with stakeholders, despite the perceived adversarial nature of the systems or even after negative initial contact. Kwan's study findings (2013) implied that trust and control can be restored, repaired, and increased; this is consistent with the literature in the field (Schoorman et al. 2007; Lewicki and Bunker 1996). Further, workplace accommodation policies that consider the interdependent processes of developing trust and balancing control are likely to achieve more successful outcomes compared to viewing these processes as separate or not considering them.

Furthermore, RTW accommodation policies should seek to integrate opportunities to develop trust and balance control among the stakeholders. Kwan's study findings suggest that ambiguity regarding the level of trust with other RTW stakeholders and questions regarding how to utilize control strategies to achieve successful outcomes exist. Notably, this study highlights the importance of capturing and measuring social interactional factors related to the RTW; these factors have not received sufficient attention in the field, likely due to methodological complexities (Kwan and Schultz 2014). Furthermore, Pransky (2013) advised that interventions planned to improve health-related work limitations may not impact work disability caused by broader social problems. Moreover, the unique relevance of these social processes for individuals with MH conditions requires further investigation.

15.4 Best Evidence-Informed Accommodation Practices for Non-visible Disabilities

The increased use of work accommodations has highlighted the growing need for best practice guidelines. Currently, stakeholders are presented with a potentially confusing selection of interventions, RTW decisions, and questions about effectiveness. The role of research evidence in decision-making has become increasingly important. Too often, research findings do not reach health professionals and decision-makers or are not applied to current practice (Loisel et al. 2005b). Furthermore, the research literature can be difficult to understand and transfer to practice for rehabilitation and disability management practitioners given the complex and multifactorial nature of work disability. The complexity of this field requires different disciplinary perspectives and methodological approaches (Hogg-Johnson and MacEachen 2013) and hence often calls for expert assistance in critical appraisal of the evidence (White et al. 2013).

The existing work accommodation research has focused on the following areas:

1. Legislation, policy, and litigation that address the implementation of accommodation policy, availability, and barriers to accommodation requests (Baldridge and Veiga 2006; Florey and Harrison 2000; Head et al. 2006; Hernandez et al. 2009) and issues related to fairness and organizational justice in accommodations (Collela 2001; Colella et al. 2004)
2. Factors that impact RTW outcomes, such as user evaluation of workplace accommodation process (Balser and Harris 2008; Soeker et al. 2008; Williams et al. 2006), and factors associated with workplace response to disability (Franche et al. 2009; Florey and Harrison 2000; Gates 2000)
3. Evaluation of accommodations used (Butterfield and Ramseur 2004; Williams et al. 2006; Yeager et al. 2006), the outcomes in terms of cost-effectiveness or cost-benefit measures (Schartz et al. 2006; Tompa et al. 2008), and the effects of accommodations on duration of disability (Durand et al. 2007)
4. Broader context of the effectiveness of workplace interventions (Anema et al. 2007; Loisel et al. 1997; Martin et al. 2013; Shaw et al. 2006) and modified work programs (Krause et al. 1998; Yassi et al. 1995)
5. Factors that facilitate and hinder workplace accommodation efforts, such as limitations in assessing functional capacities relative to job demands (Shaw and Feuerstein 2004), perceptions of accommodations (Hernandez et al. 2009), and problems with implementation in the accommodation process (Gates 2000; Lincoln et al. 2002; Shaw and Feuerstein 2004)

15.4.1 Challenges in the Accommodation Process

Overall, the quantitative and qualitative RTW literature suggests strongly that work accommodation offers reduce work disability; however, insufficient evidence exists to support the sustainability of these workplace interventions (Franche et al. 2005b; van Oostrom et al. 2009). Employees with temporarily modified work were estimated to be twice as likely to RTW and have an average of 50 % reduction in work absence compared to employees without access to modified work (Krause et al. 1998). However, the term "modified work" tends to be broadly defined to include all forms of modified work and combined with other RTW interventions (Krause et al. 1998). Work accommodations within the RTW process are often integrated within disability management programs (Durand et al. 2007; Staal et al. 2002). RTW stakeholders want to create informed policies and principles relevant to a variety of common health conditions and thus are cross diagnostic (White et al. 2013). However, more than half of the intervention research studies have specific target populations (Hoefsmit et al. 2012). Hence, the transfer of knowledge from research to practice is hampered by divergence in priorities and objectives of researchers and other stakeholders.

As with other RTW interventions, accommodations should be early but also appropriate (Pransky et al. 2001). The appropriate timing of RTW and properly structured work accommodations or job modifications to decrease ergonomic risks constitutes potential key determinants of a safe and sustained RTW (Pransky et al. 2002; Franche et al. 2005c). The implementation of early RTW through the use of work accommodations is still challenged by long-standing beliefs that individuals should rest when injured. In addition, the fear of further injury can be quite prominent among workers, medical professionals, and employers (Kwan 2013).

15.4.2 Workplace Factors

The provision of appropriate work accommodations, with the goal of enhancing employment retention for individuals with non-visible disabilities and preventing work disability, is challenging. When planning workplace interventions for non-visible disabilities, workplace factors such as task-related and interpersonal stressors need clear identification (Schultz et al. 2011d). Protecting privacy and confidentiality are also important, as workers are not obligated to disclose their diagnosis; instead, employers require an understanding of the functional capacities and limitations as a result of the injury (or illness) and the effects on work performance (Schultz et al. 2011d). Individuals with non-visible disabilities may not disclose their problems if they do not perceive the workplace to be responsive to accommodation requests. This can result in adverse consequences for the workplace or even worker reinjury (Schultz et al. 2011d).

The need for societal macro-level interventions to change public attitudes toward persons with non-visible disabilities, as well as changes in legislative health and employment policies, has been proposed (Loisel and Côté 2013; Schultz et al. 2011d). Substantial adverse workplace consequences with unidentified and unaddressed non-visible injuries in the workplace include absenteeism, presenteeism, staff attitude and behavior problems, and difficulties with relationships at work (Harnois and Gabriel 2000).

15.4.3 Job Demands: Physical Versus Psychosocial or Psychological

Workplace characteristics relevant to success of RTW interventions include not only physical job demands but also the impact of psychosocial job demands, workplace beliefs, and attitudes (Shaw et al. 2013). Work accommodations for workers with physical disorders are often considered relatively straightforward (Smith et al. 2013), as opposed to mental health-related absences. In particular, numerous stressors inherent in daily life and work environments can exacerbate the complex and episodic nature of MH disorders (Smith et al. 2013). Smith et al. (2013) found industry differences in the amount of days with full wage replacement for MSK versus MH claims. These findings indicate that industries where the nature of work may lead to MH injuries, as opposed to MSK injuries, may also be the industries where accommodations for MH problems are more difficult to put in place or are less effective. Also, more organizational and clinical challenges exist in workplace accommodations following a MH compared to a MSK claim (Smith et al. 2013).

15.5 Evidence-Base in the Accommodation Process and Best Practices

This section summarizes the evidence-based components in the accommodation process and best practices as applied to non-visible disabilities. The MSK research has not explored this topic extensively, but the recent emphasis on MH conditions increases understanding regarding informed practice with work accommodations (Pomaki et al. 2010; Schultz et al. 2012; Gatchel and Schultz 2012). A range of useful best practices has emerged for MH conditions (Schultz et al. 2011a, c, d).

The following work accommodations, supported by research on individuals with MH, are likely to be also applicable to MSK conditions:

- Modified work duties
- Flexible scheduling
- Modified work environment
- Assistive technologies

The provided list of evidence-supported work accommodations is undeniably short, especially considering the larger volume of accommodations that exist in practice and are proposed on popular specialized websites such as the Job Accommodation Network (JAN). Despite a proliferation of studies on RTW interventions and economic pressures that employers, insurers, and persons with disabilities experience with respect to inadequate RTW outcomes, the challenge of building a more comprehensive evidentiary bias for the efficacy and effectiveness of work accommodations still lies ahead.

15.5.1 Factors Contributing to Successful Work Accommodations

Recent RTW research evidence supports enhanced focus on workplace and system factors (Dionne et al. 2013; White et al. 2013). In this vein, the following components in the work accommodation process are recommended as interventions targeting both MSK disorders and MH injuries.

1. *Assessment of the accommodation needs and the workplace environment's readiness.* The mutual impact of work accommodation on the individual and work group needs to be identified (Carroll et al. 2010; Tjulin et al. 2011). In particular, commit to effective communication and flexibility to accommodate the individual (Gates and Akabas 2011). Prior to reentry into the workplace, utilize qualified professionals to conduct workplace-based functional ("ecological") assessments in collaboration with workers, management, and unions. Identification of work accommodation needs using an individualized, worker-centered approach; emphasize the employee's capacities, strengths, and compensatory skills that promote job performance and retention.

   The role of coworkers has been emphasized in some research on social support in the work accommodation process (Ahlstrom et al. 2013; Dunstan and MacEachen 2013, 2014; Kosny et al. 2013; Lysaght et al. 2012; Shaw et al. 2003; Tjulin et al. 2011). Supervisors have been shown to play a significant role in successful RTW (Loisel et al. 1997; Franche et al. 2005a; Krause et al. 1998; MacEachen et al. 2006; van Oostrom et al. 2009; Yassi et al. 1995). Supervisors, typically involved in determining a suitable work accommodation offers, can also lend legitimacy to a reentering worker's condition and work restrictions and contribute to smoothing work-related social interactions (Franche et al. 2005a; Gates 1993). It is important to ensure that supervisors are confident in identifying and developing work accommodations for employees with disabilities and have the authority to secure accommodations (Unger and Kregel 2003). Coworker and supervisor responses (Lysaght and Larmour-Trode 2008; Wrapson and Mewse 2011) are part of the workplace readiness for the work accommodation process and need to be accounted for in planning best practices. Moreover, in practice, the worker's prior attendance, disciplinary history, and peer interactions are also important considerations in implementing work accommodations (Williams-Whit and Taras 2010). The social capital available to the worker can impact on social interactions with RTW and work accommodations (Kwan 2013; Williams-Whit and Taras 2010).

2. *Monitor effectiveness of accommodations and relationships that support them at work* (Gates and Akabas 2011; Hepburn et al. 2010; MacEachen et al. 2006). Auditing the effectiveness and compliance in work accommodation implementation is crucial for RTW success. This includes establishing organizational mechanisms to report to senior management and receiving feedback from workers and the workplace. Accommodation needs to be a dynamic process due to changing clinical symptoms, job, or relationships at work (Reme et al. 2012).

   Specific to MH conditions, but also likely transferable to MSK conditions, the following approaches are recommended to monitor and maintain effectiveness of work accommodations and relationships:

   - Recognize functional problems arising from the employee's MH difficulties and differentiate them from true underperformance that may require a disciplinary approach
   - Identify environmental, management, and social factors in the workplace that may help the employee enhance performance and implement desired changes. Recognize the role of stress in reduced function among persons with MH problems and the types of stressors that are problematic
   - Provide regular supportive feedback to the employee and use both supervisors and peers as coaches
   - Ensure access to special skill training, for example, organizational skills, assertiveness, or conflict resolution skills that the employee may require to augment the utility of job accommodations and their overall job performance

3. *Balance control and promote flexibility.* Shared control between the employer and worker over work accommodations involving modification of work task requirements; changes to the work environment and location; scheduling and hours of work; use, frequency, and duration of breaks; time to complete work; work organization, and the application of assistive technology likely increase the development of trust between stakeholders (Kwan 2013). The use of hierarchy of RTW choices increases job satisfaction (Friesen et al. 2001), job security (Tarasuk and Eakin 1995), and satisfaction with the work accommodation process.

   An optimal environment for work accommodations and retention is where workplace cultures embrace opportunities for control and decision-making; offer a full utilization of worker capacities and skills; provide the opportunity for a variety of workplace activities; involve the employee; provide reasonable and well-integrated job demands; provide clear and predictable work expectations and conditions; support interpersonal contacts; value social positions in the workplace; and support productivity connected to gains and rewards. All these factors are associated with greater psychosocial benefits for employees (Kirsh and Gewurtz 2011; Krupa 2007; Uppal 2005; Vézina et al. 2004; Warr 1987).

4. *Standards and evidence-based systems for service providers.* Integrating RTW and accommodation interventions with disability management policies is important in the workplace. This process incorporates involvement of all key disability stakeholders in the design and development of policies, procedures, and practices, which would implicitly and explicitly address fairness and trust issues. At the employer level, both primary and disability prevention strategies are needed (Schultz et al. 2011a).

5. *Staff training and psychoeducational components.* Additional training, education, and increased awareness of workplace accommodations may be needed (Schultz et al. 2011c). Training direct line supervisors and coworkers how to promote safe and sustainable rehabilitation efforts through social relations in the

workplace and orientation to work accommodations are important. This may involve informing managers or decision-makers on appropriate, legal responses to a request for a reasonable accommodation and encouraging coworkers and managers to increase awareness of personal biases and perceptions of individuals with disabilities (Schultz et al. 2011c).

Training and supervision for new employees with MH disorders may include topics providing appropriate feedback, problem-solving, and realistic goal setting. Working effectively with supervisors and coworkers likely involves using positive praise and reinforcement, developing written work agreements, educating employees, and providing mentoring for interpersonal skills (Schultz et al. 2011b).

6. *Importance of social factors.* Enhancing social support in the workplace and utilizing natural supports at work (coworkers) by engaging coworkers as trainers and mentors can be especially important with MH conditions. The acceptance of individuals with disabilities is considered a social factor in RTW (Clay et al. 2012; Vornholt et al. 2013); negative social attitudes and stigma (Copeland et al. 2010; Kirsh et al. 2012) and issues related to perceived fairness of organizational processes (Hepburn et al. 2010) are social factors that need to be considered in implementation of work accommodations. Thus, attending to social factors can include recognizing negative workplace attitudes and improving awareness and educational opportunities about MH and other non-visible disabilities for coworkers and management. When appropriate, provide employees sensitivity training on MH and other clinical issues and methods on how to work with individuals who may be exhibiting overt symptoms or have cognitive difficulties, such as distractibility, short-term memory problems, and impairments in organization.
7. *Use of an employment specialist and/or RTW coordinator.* In complex or unfamiliar work conditions, or challenging labor relations situations, engaging an internal or external employment, return to work, vocational rehabilitation, case management specialist familiar with accommodations, and job retention issues among persons with MH conditions is recommended (James et al. 2011). The experience and training of rehabilitation and disability management workers impact workplace accommodation implementation (Dong et al. 2013; Lincoln et al. 2002). Recently, Dong et al. (2013) found perceptual differences in the factors in job accommodation among employees, employers, and service providers. Service providers often overestimated the importance of perceptions of fairness and cost of accommodations relative to employers, whereas employers focused on job performance in evaluating accommodation requests (Dong et al. 2013); this focus may be partly due to a substantial body of research that has emphasized the importance of these factors (e.g., Florey and Harrison 1997; Gunderson and Hyatt 1996). The difference between stakeholders may be a positive reflection of a shift in the perceptions of employers over the years.
8. *Use of multidisciplinary resources.* In complex cases, particularly in serious mental illness, it is important to ensure that the employee has access to multidisciplinary resources to help manage work performance and changes at work and is actively engaged in illness and symptom management process. Further, assessing the effectiveness of work accommodations and identifying other treatment and occupational needs, including expanded Employee Assistance Program (EAP) interventions, require considerable workplace attention. It is also important to ensure that workers collaborate with their employers in the process of maintaining physical and psychological wellness and developing self-management strategies. As well, work accommodations should be integrated with clinical and multidisciplinary interventions at the individual level to enhance a person's work readiness and work retention (Hoefsmit et al. 2012).
9. *Engage all key stakeholders.* Enhancement of multisystem interactions among employer,

health care, rehabilitation systems, and the insurance and compensation system is needed to bridge the chasm between medical model-based mental health services and employer-based vocational services (Schultz et al. 2011a). Some stakeholders have little incentive to provide work accommodations because they are able to shift costs to others (Frank et al. 1998; Young 2013). The argument exists that piecemeal approaches are unlikely to be effective; optimal success requires a coordinated approach (Frank et al. 1998; Young 2013).

> In particular, a multi-system collaboration with healthcare is much needed.
>
> Health care is usually regarded as (part of) the solution, but health care (however well intentioned) can sometimes become an obstacle, e.g. when unhelpful medical advice, inappropriate sick certification or waiting list delays block more appropriate management and early return to work. (Waddell 2006 p. 63)

Importantly, Waddell (2006) suggested that a fundamental shift in health-care culture is required to focus on a restoration of function and occupational outcomes. This includes better communication and cooperation between primary care and occupational health professionals (Waddell 2006). To not impede process, different priorities and perspectives of systemic stakeholders should be considered in the accommodation process (Dong et al. 2013; Gold et al. 2012). Research on multisystem perspectives is useful to better understand how to engage all stakeholders (Moon and Baker 2012; Seing et al. 2012); however, it is likely that some stakeholders will continue to be more invested than others in work accommodations.

15.5.2 Identified Research Gaps

Sanford and Milchus (2006) expressed concern that:

> The absence of empirical evidence base in workplace accommodations has often resulted in unnecessary reinventing of wheels and perhaps overreliance on unproven or ineffective ones in the practice of workplace accommodations. (p. 329)

The identified research gaps in the area of work accommodations are multifold.

1. *Need for assessment tools.* Descriptive prevalence studies regarding accommodations and outcome studies on the efficacy and effectiveness of accommodations for specific populations are generally lacking (Sanford and Milchus 2006). Though the importance of work accommodation in RTW is recognized, little is known about the impact of specific ergonomic, work organization, and schedule components on outcomes (Franche et al. 2005b). Research in modified work has identified the need for tools to (1) provide a link between measures of physical function and specific work tasks, (2) improve concordance between ergonomic exposure categories and usual methods of accommodation, and (3) provide a structured process for including employee and employer preferences (Franche et al. 2005a; Lincoln et al. 2002). Also, in contrast to physical work capacity evaluation, the area of psychological capacity evaluation is underdeveloped and needs a standardized toolbox. Importantly, valid and reliable assessment methods and studies that identify information needs for making decisions, including evidence of functional limitations, about appropriate accommodations are also lacking (Sanford and Milchus 2006).

   In addition, assessment tools, which address the social interactions of the accommodation process, are needed. Though the findings are preliminary (i.e., Kwan 2013), identifying the importance of developing trust and balancing control in the accommodation process is a significant step toward measuring and evaluating the social aspects of work accommodations. Recently published assessment research has looked at self-description assessment instruments to measure work performance with MSK (Mueller et al. 2013) and has proposed a core set of measurements (Reneman et al. 2013).
2. *Implementation research.* Gaps exist between known accommodation interventions and implementation. The design, implementation, and evaluation of job accommodations and

interventions for persons with MH problems are more complex and multidimensional than the development of analogous interventions and job accommodations for persons with physical limitations (Smith et al. 2013). Such interventions are evolving from legislative, policy, attitudinal, employer, and disability stakeholder perspectives, as well as from a research perspective. Despite an extensive body of research on RTW, much of the literature has focused on strategies most successful in reducing the duration of work disability and returning injured workers to the workplace rather than on how these strategies are implemented (Loisel et al. 2005a; Hepburn et al. 2010).

Notably, the MH research literature has made more strides in this area. Costa-Black (2013) stated that implementation is a relatively new challenge for the field of work disability and an area in need of further investment in research. Furthermore, MacEachen (2013) suggested that the commonly held understanding of how to deal with the challenges of multidisciplinary stakeholder involvement in work disability prevention has resulted in some advances in the field of implementation. However, intervention recommendations are still often imprecise, not practical for immediate use with many existing and multiple stakeholders with differing priorities (Loisel et al. 2005b; MacEachen 2013). In addition, MacEachen (2013) suggested that without an understanding of the nature of the relationship between the problem and its context, an intervention could be misguided and valuable resources misused. She further opined that investigations of system mechanisms can lead to a more fully developed design for interventions (MacEachen 2013), so that they are not being implemented in a relatively unknown environment. Such scenarios can leave researchers with challenges related to the fit between the interventions and the conditions of the setting.

3. *Optimal accommodations.* In addition, research is still lacking in a number of other areas: (1) the characteristics of those individuals who are most likely to benefit from the accommodations; (2) what organizational circumstances are needed to optimize the outcomes of work accommodations; (3) at what point in time, by whom, and how specific work accommodations are to be introduced in the workplace; and (4) the effectiveness of work accommodations involving social interactions and processes rather than technology and changes in organizations.

15.5.3 Future Research Recommendations

As noted earlier, a major challenge in the field of work accommodation is the differences among the interests and needs of researchers and stakeholders. The literature review on work accommodations in MSK disorders and MH identified significant research gaps in the following areas:

1. *Cross-disciplinary integration of occupational health, industrial, and organizational behavior research.* Loisel et al. (2005a) postulated that the multidimensional nature of work disability requires researchers to have specific knowledge of the field and skills to gather transdisciplinary expertise and cultivate interactions with various stakeholders. The authors further described a paucity of resources to address the complexity of work disability prevention research that would advance the field and improve management of work disability (Loisel et al. 2005a).

   To date, no single model exists that represents the complexity of the disablement process that addresses the multisystem influences (Loisel and Côté 2013); this poses a significant research challenge requiring extensive investment, likely by multiple stakeholders. A lack of research is apparent on which primary and secondary workplace prevention programs are associated with improved job retention and accommodations and under what conditions (who, where, when, and what) they are effective. Moreover, there is no consensus on how to best measure clinical, occupational, and employment outcomes (Loisel and Côté 2013).

2. *Integrating voices of other stakeholders*. A need to develop more understanding of the lived experience of working with a MH disability is required. Attention needs to be directed to how peer supports and social interaction-related approaches and strategies can be effectively used in the workplace context. However, with MSK disorders, MacEachen (2013) suggested that much of the qualitative research already focused on the experience of injured workers (e.g., Beardwood et al. 2005; Roberts-Yates 2003) and, instead, a need to increase focus on other systems is recommended. Importantly, MacEachen (2013) noted that, "research on how systems function in practice may contribute to three-dimensional conceptualization of causes, processes, and outcomes in work disability prevention" (p. 227).

   Future research would especially benefit from incorporating the perspective of primary health-care providers. The knowledge and participation in work accommodation of primary health-care providers has generally been recognized as another area in need of further research and identification of best practice guidelines. Despite the central role that they have provided in the accommodation process, they often lack the necessary training or access to information about client's workplaces to make functional ability assessments (Young, 2013).

3. *Functional assessment*. A paucity of validated assessment instruments that measure functional work capacity is noted; existing psychological and neuropsychological tests are diagnostic rather than functionally oriented. Yet, standardized and validated functional "ecological" assessments are critical for the development of job accommodations and to facilitate future research (Rogers and MacDonald-Wilson 2010). Assessment of the social processes of trust and control within the work accommodation process may also prove beneficial to address the importance of social interactions in work accommodations (Kwan, 2013).

4. *Effectiveness of work accommodations*. Research on the effectiveness of work accommodations is emerging; methodological difficulties include small sample sizes, the use of samples of convenience, a lack of tools for pooling data from several studies, control groups and randomized designs, difficulties in standardizing protocols for job accommodations in workplace environments, and the multitude of extraneous ("environmental noise") factors affecting outcomes, together with difficult-to-capture organizational and clinical treatment factors. Moreover, multivariate and multilevel statistical analysis models are underutilized.

   In addition, the effectiveness of accommodations is likely dependent on the type and stability of functional work limitations, timing of interventions, consistency of applications, a variety of employer-related and coworker-related support factors, as well as task demands and worker control over the work tasks. Such conditions and factors demand difficult, labor-intensive, and costly-to-execute research designs. A combination of qualitative and quantitative research studies, using a mixed design approach, conducted by teams of researchers in different geographic locations yet using the same methodology, is likely to be the most promising approach (Schultz et al. 2011b, d).

15.6 Concluding Remarks

Despite major societal, clinical, employer, and research advances in the area of health in the workplace, a major gap continues to exist between health-care services, rehabilitation, and the occupational needs of workers with non-visible disabilities on one hand and research evidence on what works with whom, where, and when in the workplace on the other. A new research paradigm for non-visible disabilities in the workplace, integrating multisystem research with combined clinical and occupational approaches, is emerging and much needed. Only by integrating the efforts of researchers, policy-makers, health-care practitioners, employers, educators, disability compensation systems, and persons with non-visible disabilities, especially those with MH disorders, can the challenge of effective disability accommodations in the workplace be addressed.

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Participatory Ergonomics for Return to Work

16

Dwayne Van Eerd, Donald C. Cole,
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16.1 Introduction: The Burden of Musculoskeletal Disorders (MSDs)

Work-related musculoskeletal disorders (MSDs) are a constellation of painful soft-tissue disorders of muscles, tendons, joints and nerves which can affect all parts of the body, although the neck, upper limb and back are the most common areas (Schneider and Irastorza 2010; Silverstein and Evanoff 2011). Symptoms reported for MSDs include pain, burning, or numbness/tingling which can be mild or become quite severe, especially if not appropriately treated (Silverstein and Evanoff 2011).

MSDs continue to be problematic worldwide. In the USA, the Bureau of Labor Statistics (BLS) reported 333,760 MSDs in 2007, an annual incidence rate of 35 per 10,000 workers (Silverstein and Evanoff 2011). It is estimated that work MSDs account for 29 % of all injuries and illnesses. This is a drastic increase from the 5.1 per 10,000 workers reported in 1984 (Hales and Bernard 1996). Direct compensation costs for MSDs are estimated to be between $13 and $20 billion dollars annually in the USA where, on average, they result in a median of 9 days off work (Silverstein and Evanoff 2011).

In Europe, MSDs are considered to be an increasing and significant health problem, which make up approximately 39 % of the total occupational disease burden in Europe (Schneider and Irastorza 2010). The cost of work-related upper limb MSDs has been estimated at between 0.5 and 2 % of the Gross National Product (GNP) (Schneider and Irastorza 2010). MSDs are considered to result in a sizeable proportion of total absenteeism in Europe.

The MSD picture is similar in Canada, with upper extremity MSDs and low back pain the leading diagnoses of disabling work-related injuries. In Ontario, the Workplace Safety and Insurance Board (WSIB) reports soft tissue injuries as a consistent and sizeable problem, representing 40–50 % of lost-time claims since the year 2000 (WSIB 2009). In Nova Scotia, MSDs (sprains and strains) represented 53 % of all 2009 compensable time-loss claims (Workers' Compensation Board of Nova Scotia 2009), while in British Columbia (BC), 41 % of the total claims for 2009 were for MSDs (overexertion/bodily motion) (WorkSafeBC 2009). These data suggest MSDs are a leading cause of time-loss injury claims and lost productivity in Canadian workplaces.

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In all jurisdictions, difficulties exist in the classification (Van Eerd et al. 2003) and assignment of work-relatedness (Sluiter et al. 2001) of musculoskeletal disorders and, therefore, it is quite likely that the reported rates of MSDs are underestimates. Additionally, workers with MSD conditions such as pain are likely to underreport their condition (Sullivan and Cole 2002). Thus, the magnitude of the impact of MSDs on workers, employers, health care systems, and society is likely much larger than estimated by examining routinely collected administrative data.

Epidemiological investigations have identified a broad range of physical, psychological, psychosocial, and organizational risk factors for MSDs (Hagberg et al. 1995; National Research Council 2001; Silverstein and Evanoff 2011; Sluiter et al. 2001). There is relatively little debate among the scientific community regarding the work-relatedness of MSDs. The research focus has moved from establishing cause to studying effectiveness of prevention and treatment (Silverstein and Evanoff 2011).

16.2 Ergonomics as an Intervention for MSDs

Broadly speaking ergonomics concerns the science and practice of improving work environments (see Box 16.1). When considering MSDs, ergonomists should have a solid understanding of the broad range of elements related to ergonomics. Research on the risk factors of MSDs has shown links to physical, psychosocial, and organizational factors (Evanoff et al. 1999; Laitinen et al. 1997a, b; Moore and Garg 1997). Depending on the circumstances and desired outcomes, workplaces may limit the scope of an ergonomic intervention, requiring a focus on certain factors. The literature describing ergonomics interventions for MSDs is dominated by a focus on the physical factors. The interventions often address force, repetition, and duration aspects of physical tasks and body postures in the working environment. However, there are examples from the literature where psychosocial (Evanoff et al. 1999) and organizational (Laitinen et al. 1997a, b) factors are considered within intervention programs to reduce risk factors for MSDs.

Box 16.1 Definition of Ergonomics
Ergonomics, as defined by the International Ergonomics Association (IEA), is the "scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance.

Practitioners of ergonomics, ergonomists, contribute to the planning, design and evaluation of tasks, jobs, products, organizations, environments and systems in order to make them compatible with the needs, abilities and limitations of people." (www.iea.cc).

Ergonomists are trained to evaluate the working environment and human interaction, to identify risk factors, and to design and implement accommodations to reduce the risks for injury while maintaining productivity. Ergonomists will typically interact with the individuals involved in completing the tasks observed. This is a method of gaining useful, much needed information about the tasks, forces, and time pressures an individual worker faces in their job. However, in a consultant or practitioner model, the individual worker may not be involved in developing the solution or designing the changes to be implemented. Participatory ergonomics is a method of engaging the individuals who are involved in and/or responsible for completing the work tasks that may require change.

16.3 Participatory Ergonomics

16.3.1 The Origin and Nature of Participatory Ergonomics

Motamedzade et al. (2003) reported that the term "participatory ergonomics" (PE) was coined in 1983 by Kazutaka Kogi after discussions with

Kageyu Noro. The concept of a participatory approach was developed further by Noro in a workshop setting the following year (Noro and Imada 1991; Noro 2003). Participatory Ergonomic (PE) approaches grew out of quality circle experiences in Japan (Liker et al. 1989; Motamedzade et al. 2003) and participatory workplace design processes in Northern Europe (Elden 1986) and North America (Liker et al. 1989) during the 1980s.

PE interventions grew in popularity through the 1990s (Motamedzade et al. 2003), with increasing reports in the literature describing the interventions in different types of workplaces. Newspapers (Rosecrance and Cook 2000), meat packing plants (Moore and Garg 1997), automotive production (Liker et al. 1989), and hospitals (Evanoff et al. 1999; Bohr et al 1997), as well as unions (Simon and Leik 1999) and health and safety sector agencies (Wilson and Haines 1997) all actively promoted PE approaches.

A characteristic feature of most PE interventions has been the formation of some type of "team" or committee, typically made up of employees or their representatives, managers, ergonomists, health and safety personnel, and possibly research experts. Once formed, teams usually receive training from an expert, most often an ergonomist, to become familiar with ergonomic principles (Wells et al. 2000). Once this foundation is in place, the group uses its newly developed knowledge to make improvements in the workplace (Halpern and Dawson 1997; Haims and Carayon 1998; Reynolds et al. 1994). The process of making improvements typically involves the following steps: identifying areas of opportunity (where are the hazards), conducting hazard assessments, developing and proposing solutions, implementing solutions, and evaluating solutions. These steps are often iterative as new areas and hazards are identified.

Because team members work together in PE interventions to improve workplace conditions through participation, communication, and group problem-solving, they can have a positive impact on workers' exposures and health (de Jong and Vink 2000; Haims and Carayon 1998; Haines et al. 2002; Laitinen et al. 1997a, b; Nagamachi 1995; Simon and Leik 1999). Ideally, the PE approach encourages workers to be involved in controlling their own work activities, which consequently decreases work organization or psychosocial risk factors for MSDs (Wilson and Haines 1997; Westgaard 1999; Bongers et al. 2002).

In 1998, Haines and Wilson prepared a report for the Health and Safety Executive (HSE) of the UK describing the development of a framework for participatory ergonomics (Haines and Wilson 1998). The report was ambitious in its scope, including a review of literature on PE with a narrative synthesis of the practices regarding the implementation of PE. The report covered definitions of PE, showing that the concepts represented varied with the underlying approaches and the focus of the researchers-practitioners involved. Shaping the various definitions were concepts related to participative management, worker-centric views, and macro-ergonomics. Distinctions were also made about how participation is defined within PE.

The existing definitional idiosyncrasies were described by Haines and Wilson (1998) as the "fuzziness" associated with the concept of PE. As the authors recognized that there is no general agreement about the exact definition of PE, they went on to provide their own definition. They suggested that their new definition covers a broad range of PE interventions or programs in the full variety of settings that could implement PE. We use the Haines and Wilson definition in this chapter (see Box 16.2), agreeing that it is general enough to cover the variety of ways PE could be conceived in practice. We also include a shorter definition provided by Kuorinka (1997).

Box 16.2 Definitions of Participatory Ergonomics

1. "the involvement of people in planning and controlling a significant amount of their own work activities, with sufficient knowledge and power to influence both processes and outcomes in order to achieve desirable goals" (Wilson and Haines 1997 p. 12).
2. "practical ergonomics with participation of the necessary actors in problem-solving" (Kuorinka 1997).

The main objective of Wilson and Haines' report was to describe a new framework for PE that could be used both for applied research and for the implementation of PE programs in workplaces. The framework built upon previous research and the work of others in the field to describe eight dimensions along which PE interventions or programs may vary. The authors provided an in-depth description of the PE process including key prerequisites necessary to initiate PE. The report's authors teamed up with other colleagues in an article describing their attempt at validating the framework (Haines et al. 2002). The updated participatory ergonomics framework (PEF) with nine dimensions (see Table 16.1) has been found useful by other researchers, demonstrating content validity and utility.

16.3.2 Evidence About the Effectiveness of Participatory Ergonomic Interventions

The effectiveness of PE interventions in improving health outcomes was examined in a systematic review (Rivilis et al. 2008). The review employed a comprehensive literature search and a rigorous and transparent review process to examine intervention effectiveness. Study relevance was determined by consensus in a screen of articles by two reviewers. The methodological quality of relevant articles was also determined by consensus achieved by two reviewers. Using a "best evidence" synthesis approach, 12 studies were identified and rated as medium or higher methodological quality. These studies provided some evidence that PE interventions could have a positive impact on musculoskeletal symptoms, on reducing injuries and workers' compensation claims, and on lost days from work or sickness absence. Despite the evidence, the authors recommended further high quality research was needed to gain a deeper understanding of PE interventions and their effectiveness in improving worker health.

More recent literature reviews of workplace interventions to prevent disability and/or improve return to work (RTW) have included studies about PE interventions (Aas et al. 2011; Caroll et al. 2010; Williams et al. 2007; van Oostrom et al. 2009). Findings from these reviews generally suggest positive impacts from PE interventions but heterogeneity of the interventions and the limited number of high quality studies posed challenges for determining the level of evidence regarding PE interventions.

Recent publications have been less positive than these reviews when examining the effectiveness of PE interventions. In a Finnish cluster-randomized trial (RCT), participatory ergonomic groups were formed across sets of three to five municipal kitchens, with support from an ergonomist (Pehkonen et al. 2009). Groups participated in workshops and workers' knowledge and awareness of ergonomics increased. Together, they implemented 402 ergonomic changes, which they perceived to decrease physical load and improve musculoskeletal health. However, among the 504 workers of 119 kitchens (intervention $n=59$; control $n=60$), no differences were observed in outcomes. These included the occurrence of and trouble caused by musculoskeletal pain in seven anatomical sites, local fatigue after work, and sick leave due to musculoskeletal disorders either during the 9–12 month intervention or over a 1-year follow-up period (Haukka et al. 2008). The authors across the two papers noted that hindering factors for implementation included lack of time and motivation, insufficient financial resources and limited support from the management and technical staff. They surmise, "that a more comprehensive redesign of work organization and processes is needed, taking more account of workers' physical and mental resources" (Haukka et al. 2008 p. 849).

Similar conclusions were reached in a multiple case study of four worksites in different companies using a quasi-experimental approach (Cole et al. 2009). It was concluded that, "Ergonomic change teams (ECTs) faced chal-

Table 16.1 Dimensions, categories, and criteria of PE according to the participatory ergonomics framework by Haines and Wilson (Van Eerd et al. 2010). Reprinted here with permission from Taylor & Francis Ltd, www.tandfonline.com

Dimensions	Categories	Criteria (based on Haines et al. 2002)
Permanence	Ongoing	Ongoing participatory mechanisms … more integrated into the structure of the organization
	Temporary	Participatory ergonomics mechanisms functioning on a temporary basis
Involvement	Full direct	Each employee participates directly in decisions about their work
	Direct representative	Employee representatives are selected to represent viewpoints of a large number of workers
	Delegated	Representatives not actively representing the views of others but represent a typical subset of a larger group
Level of influence	Group of organizations	The PE process takes place across a number of organizations working or belonging to a group (such as a professional association)
	Entire organization	The PE process takes place at a single organization or workplace
	Department/work group	The PE process takes place in a department or workgroup within a single organization
Decision making	Group delegation	Management gives employees increased discretion and responsibility to organize … their jobs without reference back
	Group consultation	The PE team is encouraged to make their views known on work-related matters but management retains the right to take action or not
	Individual consultation	An individual worker is encouraged to make their views known on work-related matters but management retains the right to take action or not
Mix of participants	Operators	Workers involved in teams
	Line management	First level managers/supervisors involved in teams
	Senior management	Senior managers involved in teams
	Technical staff	Internal specialist or technical staff (such as engineers, or health a safety specialists) involved in team
	Union	Union members or representatives involved in team
	External advisor	External advisor (such as ergonomic consultant from outside of company) involved in team
	Supplier/purchaser	Supplier or purchaser of equipment involved in team
	Cross-industry organization	Cross industry or organization personnel (such as industry association representative) involved in team

(continued)

Table 16.1 (continued)

Dimensions	Categories	Criteria (based on Haines et al. 2002)
Requirement (for participation)	Compulsory	Participation required as part of job specifications
	Voluntary	Voluntary participation in PE process
Focus	Tools and equipment	Changes to “tools and equipment” involve physical changes to the workstation or tools/equipment used by workers.
	Work processes	“Work processes” may include, for example, changing the order or way of doing things, and may include job rotation and scheduling changes.
	Workplace organization	Examples of “workplace organization” include changes in management reporting, structure of departments or workgroups, or upper management changes (macro ergonomics).
Remit	Problems identification	Involved in identification of problems
	Solution development	Involved in generating solutions to problems identified
	Implementation	Involved in implementing change
	Set-up/structure	Involved in setting up or structuring the process
	Monitor/oversee	Involved in monitoring or overseeing the process of the initiative
Role of ergonomic specialist	Initiates and guides process	Ergonomist is key in initiating and guiding process as integral part of duties
	Acts as expert	Ergonomist is part of the team to provide expertise in ergonomic matters
	Trains members	Ergonomist primarily focuses on training
	Available for consultation	Ergonomist is available for consultation as needed (therefore may not be member of team)
	Not involved	Ergonomist is not involved in the PE process

lenges securing employees’ time, varying management commitment and significant production pressures. Nevertheless, they actively introduced between 10 and 21 changes over 10–20 months of activity” (Cole et al. 2009 p. 161). However, these changes brought limited outcomes in the intensity of exposure reduction. Based on pre-post assessment, using questionnaire-based measures, no discernible effects in physical effort or pain were experienced by the employees. In parallel, the authors explored the intensities of changes in the same participatory ergonomics research program (Wells et al. 2009). Those changes affecting production system redesign and reconfiguration were judged to have medium to high intensity, while most other changes were judged to be of small intensity. This may be a particular concern for return to work related changes to a particular job or set of jobs for which a returning worker may be seeking accommodation, i.e., substantial efforts may need to be made in order to achieve sufficient intensity of changes to effectively reduce workloads.

In the Netherlands, a cluster RCT was conducted among 19 intervention departments and 18 control departments of “four Dutch companies: a railway transportation company, an airline company, a university including its university medical hospital, and a steel company" (Driessen et al. 2011 p. 675). As part of a Stay@Work participatory ergonomics (PE) program, working groups in each intervention department followed a series of steps. They designed ergonomic changes for jobs causing low back and neck pain, prioritized them, and then implemented them. After 12 months, among the 3047 workers, no difference was observed between groups in the prevalence of low back and neck pain. PE interventions did, however, increase the probability of recovering from low back pain (OR 1.41, 95 % CI 1.01–1.96), something most relevant for RTW or stay at work situations.

In a secondary prevention trial, workers at three large Finnish companies with medically verified upper-extremity disorders not severe enough to require sick leave, were randomized to receive a new intervention (Martimo et al. 2010). The physician contacted the worker's supervisor to discuss accommodations. An occupational physiotherapist visited the workplace, assessed "the physical work environment, available tools or instruments, working postures, force requirements, work pace and breaks during work, as well as the employee's possibilities to continue working" (Martimo et al. 2010 p. 27). In a limited form of participation, she made some changes on site, and discussed her suggestions with the employee and the supervisor, the latter of whom then made the final decision on further technical and administrative changes. Among the 177 employees who were randomized, over 50 % self-reported productivity loss at baseline. At 12 weeks, statistically significant differences were observed in the proportion of workers self-reporting persistent productivity loss (25 % intervention, versus 51 % control). Further, intervention workers experienced a reduction in the magnitude of productivity loss (7 % versus 18 %, $P=0.001$).

Hence, there remains a promise with respect to ergonomic changes in consultation with employees and their supervisors. However, PE interventions are heterogeneous and context dependent, with varying outcomes. Instituted changes must be substantial or intense enough, and focused on the particular needs of workers to which they are directed.

16.3.3 The Implementation of Participatory Ergonomics as an Intervention

Literature reviews provide details about the implementation and evaluation of PE interventions (Haims and Carayon 1998; Haslam 2002; Hignett et al. 2005; Nagamachi 1995), including elements of the process (Haines and Wilson 1998). Hignett's narrative review provides an excellent summary of the strengths of PE with examples from a range of industries (Hignett et al. 2005). The benefits of implementing successful PE programs are also described (Wilson and Haines 1997).

A recent systematic review of the literature on the implementation of PE interventions found some common elements across various studies from different jurisdictions and industries (Van Eerd et al. 2010). The review employed a comprehensive literature search of the peer-reviewed and grey literature. The grey literature (reports and documents that are not peer-reviewed and typically not controlled by commercial publishing) was considered an important source by the many stakeholders contacted as part of the review process. The review followed a rigorous and transparent process to reduce bias. However since the topic was not intervention effectiveness, the emphasis was not on methodological quality but on the description of the process and implementation of PE, adapting the Haines and Wilson framework to describe the nature of PE.

The review findings suggested that developing teams and involving the right people in the process were key aspects of the intervention. In addition, some of the most important facilitators to PE implementation were the following factors: support of management and coworkers, communication, training and resources (Van Eerd et al. 2010). The review findings were used to create an evidence-based guide to aid in the initiation of PE interventions in workplaces (see Fig. 16.1 below).

Reducing
MSD hazards
in the workplace

A guide to successful
participatory ergonomics programs

Institute
for Work &
Health

Research Excellence
Advancing Employee
Health

Fig. 16.1 Cover of the PE Guide, an evidence-based approach to initiating participatory ergonomics in workplaces (Institute for Work & Health 2009)

Recent studies have focused on the process evaluation of PE interventions (Cole et al. 2009; Driessen et al. 2010). Cole et al. (2009) presented a description of participatory interventions using a multiple case study approach. They examined four PE interventions across four workplaces and described the effects of the interventions using a path analysis. In addition, they conducted fieldwork and interviews to explore common themes about the process of the interventions across workplaces.

The findings from the process evaluation revealed issues and concerns with production pressures, securing employees' time, management commitment, and frustrations over delays. These issues were found across all workplaces to some degree. Prior to the PE intervention research, these workplaces did not exhibit participatory cultures and had little ergonomics knowledge. However, the early stages of the PE process showed advances in setting up the PE process by means of regular meetings and training in ergonomics. Cole et al. (2009) suggested that the process evaluation was most useful and that future research should report on the process to better understand how PE interventions can be effectively implemented. They suggested that process information, even without changes in health measures could be useful to future applications of PE.

Driessen et al. (2010) completed a process evaluation of a PE intervention which was part of a cluster randomized controlled trial. The focus of the PE intervention was to reduce low back pain and neck pain among workers. Driessen and colleagues (2010) selected and defined five key components from Linnan and Steckler (2002): recruitment, reach, fidelity, dose delivered, and dose received (the last two were combined and called implementation components). To these components, they added one called "satisfaction." The authors defined these components according to variables available in the PE intervention trial or self-report survey measures created to address the concept.

The results of the process evaluation suggested that the PE intervention was feasible and successful in prioritizing risk factors and in developing solutions to address these risk factors. The authors did not feel that the process evaluation was as useful in evaluating implementation of solutions, though study results suggested relatively limited implementation of the solutions developed by the workplace teams. Despite these findings, the authors point out that the process evaluation was useful in defining the successful and not so successful aspects of the PE intervention in a large intervention trial.

The focus on process evaluation can be important for successful intervention studies to better understand the mechanisms of beneficial effects and the transferability of the intervention to other contexts. This may be particularly important for complex interventions such as PE in which a better understanding of the contextual factors can assist in the implementation of PE interventions in other workplaces. It may take time for effective ergonomic interventions to result in a reduction of injuries and lost time claims (Rivilis et al. 2008). Therefore, process and implementation evaluation, together with consideration of additional indicators, are likely important in the evaluation of PE interventions.

16.4 Participatory Ergonomics as a Return to Work Intervention

16.4.1 The "Sherbrooke Model"

A number of intervention studies have aimed to examine the effectiveness of participatory ergonomics on return to work. One of the earliest attempts was published by Loisel et al. (1997). In this study, conducted in Quebec, Canada, participatory ergonomics was a part of the Sherbrooke model and a component of the first intervention step. It was followed by interventions based on back school principles and work hardening for workers on sick leave due to low back pain. In the first step, an injured worker was examined by an occupational physician and the jobsite was visited by an ergonomist to give appropriate recommendations for RTW to the worker's general practitioner. Each of the participating companies had a PE team in place that was trained in the weeks after an injured worker came into the study. Both employees and management representatives were trained in the approach during a 2-day session and served as the back pain advisory group of that company. Although the study was ended prematurely because of changes in legislation that would have confounded the results, a statistically significant and relevant effect of PE on RTW was found, where those that received the intervention returned to work 1.9 times faster compared to those that did not (Hazard rate ratio and 95 % confidence interval, Hazard rate ratio = 1.91, [1.18–3.10]).

The first Dutch replication of the Sherbrooke model study also aimed to improve RTW in workers on sick leave due to low back pain (LBP). The PE intervention, however, was organized rather differently; PE teams were formed on an ad hoc basis. The injured worker, his/her direct supervisor, possible other stakeholders at the worksite (such as a coworker or facilities manager) met with a representative of the occupational health service for a half-day session where they were trained in the fundamentals of the PE approach. Despite a different approach, the Dutch trial yielded similar results as the Quebec trial (Hazard rate ratio = 1.7; 95 % confidence interval [1.2–2.3], for the PE intervention) (Anema et al. 2007).

In a commentary on the paper reporting the effectiveness of the model (Anema et al. 2007), Hadler (2007) stated that “only 50 %” of the solutions were implemented and therefore it must have been the process of worker involvement itself and not as much the ergonomic solutions that contributed to the outcomes. Although this is a plausible explanation, there is another side to this finding. When presenting the process of intervention (Anema et al. 2003) to ergonomists, the received feedback was more optimistic. A Dutch pilot study (Anema et al. 2003) found that 7.9 solutions per case (SD 3.9) were proposed and on average 50 % of these solutions were implemented. Loisel et al. (1994) had a similar result in their study. Experienced ergonomists explained that, in their practice, attempting to implement more than three solutions was considered non-feasible. They expressed their surprise over the large number of solutions that were implemented in the study. It should be noted that those implementing the intervention were advised to stay within a limit of three feasible solutions to be implemented by the stakeholders in the workplace.

Following the earlier Dutch trial (Anema et al. 2007), PE was also evaluated as part of an “integrated care approach” for chronic low back pain sufferers that were off work for a longer period of time (Lambeek et al. 2010). The overall approach was found to be highly effective, again, with workers receiving the intervention returning to work 1.9 times faster compared to those that did not (95 % confidence interval 1.2–2.8). The effects of the different intervention components (PE and graded activity) could not be disentangled due to the design of the study. However, unlike in the Anema et al. (2007) trial, the interventions were communicated to the patients as an integrated approach and all those in the intervention group received both intervention components. This intervention approach likely prevented miscommunication, increased treatment compliance, and decreased follow-up attrition in this study.

Further analysis of the earlier Dutch trial showed that the PE intervention was particularly effective in older (≥44 years) workers and those that reported sick leave in the year prior to inclusion in the study (Steenstra et al. 2009). This finding could be explained by the fact that these workers were more experienced in their job and likely more capable of providing appropriate solutions to remove barriers for sustainable RTW.

A participatory RTW intervention was also effective with respect to time reported for sustainable first RTW among temporary agency workers and unemployed workers sick-listed due to musculoskeletal disorders (Vermeulen et al. 2011). It should be noted that the reported Hazard rate ratio (HRR) was time dependent, which means that a positive effect occurred after 90 days post randomization. However, this finding seems inconsistent with an intention to treat analysis, whereby the intervention effect should be determined for all those included, starting right after randomization. In a process evaluation, it was noted that offering of suitable temporary employment was delayed by 44.5 days (van Beurden et al. 2012). However, considering that these workers were finding a job in a time of economic recession, labeling this as a delay of the intervention might not be entirely justified.

Notably, PE did not seem to be effective in RTW for common mental disorders (HRR = 0.99 (95 % confidence interval 0.70–1.39) (van Oostrom et al. 2009). The development of the intervention was largely identical to the other versions of the PE approach of the studies that found a statistically significant effect. The authors state that stigma is more important in RTW scenarios involving common mental disorders. They also found that the intervention might be effective for those who reported at baseline that they had the intention to RTW compared to those who reported that they did not anticipate a possibility to RTW. However, this is an exploratory finding which was not hypothesized prior to data collection, and it should be confirmed in a future study (Sun et al. 2009). Overall, most PE interventions with solutions by all relevant stakeholders have been of relatively short duration.

16.4.2 Recent Studies: Going Beyond the "Sherbrooke Model"

Recent intervention studies have proposed participatory components to address RTW (Ammendolia et al. 2009; Bultmann et al. 2009). These studies included aspects of PE within the workplace interventions drawing upon the methods of the Sherbrooke studies and replications.

The intervention proposed by Ammendolia and colleagues (2009) was focused on the prevention of low back pain. It was developed through an intervention mapping process and synthesis of knowledge from a review of the literature. The evidence-informed approach led to a five-step RTW intervention that incorporated a participatory ergonomics approach built upon that of Loisel et al. (1997), Anema et al. (2007) and Steenstra et al. (2003). Unfortunately, the intervention developed by Ammendolia et al. (2009) was neither implemented nor evaluated for effectiveness because of changes in the case management approach at the workers compensation board (WSIB) in Ontario. These changes were deemed sufficient to compromise the internal validity of a possible randomized controlled trial.

Bultmann and colleagues (2009) conducted a study to compare the effectiveness of a coordinated, tailored work rehabilitation (CTWR) intervention with conventional case management (CCM) involving RTW of workers on sick leave due to MSDs. The intervention was a team-based approach, which drew upon PE, as described by Loisel et al. (1997), to identify the barriers to RTW. An interdisciplinary team, including an occupational physician, physiotherapist, psychologist and social worker, formulated and implemented a tailored work rehabilitation plan. The study found that the sickness absence hours were significantly lower in the CTWR group as compared to the CCM group for time intervals 0–6 months (average difference of 120 h, $p < 0.034$); 6–12 months (average difference of 221 h, $p < 0.009$); and the 0–12 months (average difference of 341 h, $p < 0.006$). The study also reported cost savings that were associated with the CTWR intervention.

These two studies are examples of how the PE approach could be applied in RTW interventions for workers with MSDs. These interventions appear to be more comprehensive in nature, with detailed consideration of workplace and system contexts.

16.5 Implementation of Participatory Ergonomics as a Return to Work Intervention

The research from the Netherlands, found that participatory ergonomics does not necessarily require major changes to get a worker back to work (Steenstra et al. 2003). The process leaders (ergonomists, occupational therapist, occupational physiotherapists and occupational nurses) involved in the Dutch study were trained to favor solutions that are carried out by the stakeholders. Importantly, the worker is often the expert prepared to come up with solutions, which could also benefit coworkers. The worker-led solutions were employed even if they were not completely in line with the process leaders' professional beliefs about the most appropriate solution. Completely eliminating certain exposures, like lifting of loads over 25 kg, is highly unlikely in, for instance, the nursing profession. Nevertheless, the process of RTW provides a good opportunity to consider possible solutions to reduce the exposures, to retrain certain skills, and to reconsider the proper use of lifting aids. In the process of implementation, the research team found that it was important to have the intervention and the associated costs approved quickly by the workplace. Pre-authorization is preferred, which means that an employer agrees to implement the intervention as soon as an injured worker is off work for a certain amount of weeks.

The literature review by Shaw et al. (2008) showed that RTW coordination involves workplace assessment, planning for transitional duty, and facilitating communication and agreement among stakeholders. Successful RTW coordination may depend more on competencies in ergonomic job accommodation, communication and conflict resolution than on clinical training. Another consideration is that a process leader needs to be available when an injured worker is off work for a certain amount of time. Intervention might be needed at any time and process leaders cannot be scheduled in months in advance, unlike primary preventive interventions planning.

An important aspect of a RTW intervention is that responsibilities of the players need to be clearly defined and deadlines for implementation of solutions set and monitored. This is especially true in the early stages, when workers are potentially away from the worksite. Responsibility for implementing solutions might lie with the injured worker and/or direct supervisor, but a third party should be available to ensure that responsibilities are met in a timely manner.

A RTW intervention can only be successful when it takes place in the real-life workplace. Therefore, access to the workplace for the injured worker and a third party process leader is essential. In addition, within a given workplace, there should be a consistent approach to implementing modified duties or else resistance may occur when advising temporary modified duties. In some cases, modified duties do not seem to be temporary. Rather than modified, the assigned duties may be unrelated to the original job in question. Modified duties, if consistently implemented, can be a tool in the process of successful RTW.

16.6 Tools to Aid Participatory Ergonomics Implementation

A combination of factors tends to facilitate the implementation of PE in workplaces (Driessen et al. 2010; Van Eerd et al. 2010). Key among them are support for the PE program from the organization (management, coworkers and union), resource commitment (includes time and money), and open communication about the PE program. Therefore, PE implementation requires a clear outline of the main elements of a PE program along with an explanation of the barriers to overcome.

An evidence-based tool, the *PE Guide*, was designed by the Institute for Work & Health in Toronto, Canada (IWH) to address the challenges of initiating a PE program. The *PE Guide* was developed from the findings of the earlier cited systematic review of the literature about PE process and implementation (Van Eerd et al. 2010). Feedback from health and safety stakeholders from across Canada was received and helped to give the guide a practical focus. The PE guide provides evidence-based information to those who can initiate PE programs. The audience includes workplace managers, supervisors and workers who may have health and safety responsibilities. An additional audience is occupational health and safety practitioners, such as ergonomists or consultants who work with workplaces to implement programs to reduce risk and injuries. The guide, a 12 page brochure, was designed to be easy to understand and applicable to practice (see Fig. 16.1). It defines PE, describes how to initiate PE in a workplace and addresses the key facilitators for implementing a PE intervention.

The guide was designed to complement more process-oriented tools, such as the PE Blueprint (Wells et al. 2000) and the MSD Guidelines (from Ontario) (OSCHO 2007). Workplace parties can turn to such process tools to guide detailed PE processes.

16.7 Discussion and Summary

Participatory ergonomics has been used in a wide variety of workplaces to return injured workers to work. Most often, the workers' injuries are musculoskeletal disorders (Anema et al. 2007; Loisel et al. 1997), perhaps not surprising given the burden associated with these injuries. Nevertheless, a PE approach can be used for other types of disorders as well (van Oostrom et al. 2009).

Studies of effectiveness of PE interventions for prevention of injuries have yielded mixed findings. Some studies have shown that PE interventions can have a positive effect on MSD outcomes, such as musculoskeletal symptoms, injuries and workers' compensation claims, and on lost days from work or sickness absence (Rivilis et al. 2008). However, more recent studies with rigorous study designs have not found PE interventions to be effective in the prevention of MSDs (Haukka et al. 2008; Pehkonen et al. 2009). There appears to be a great deal of variability in the "intensity" of the PE interventions across studies. More research is necessary with attention to the process and implementation of the PE interventions. The recent focus on process evaluation (Anema et al. 2003; Cole et al. 2009; Driessen et al. 2010) seems to be a useful approach to better understand how PE interventions may achieve impacts.

Moreover, PE interventions have been employed in interventions to return injured workers to work. PE RTW interventions tend to be more tailored to the individual, involve more interdisciplinary teams, and incorporate interventions additional to PE interventions. Studies have fairly consistently shown PE RTW interventions to be effective. The increased focus on the individual, team diversity and specific rehabilitation intervention components may explain why PE RTW interventions are more commonly effective as compared to PE prevention interventions.

Participatory components within RTW interventions appear to show great promise, especially when combined with rehabilitation interventions. Participation involving an interdisciplinary team may go well beyond the redesign of job tasks and equipment in encouraging communication that is considered a key element of effective RTW (Franche et al. 2005). When the communication is related to PE, the focus is on solving concrete issues for RTW. Focusing on solutions may help reduce the potential negative effect of attention on barriers to RTW.

When implementing a PE RTW intervention, some key facilitators should be considered, including the following: reasonable access to the workplace; clearly defined responsibilities; prior (or early) approval for solutions; a process leader available when a worker and their supervisor are available; and adherence to timelines. Note that major changes are often not required to accommodate workers. However, modified duties may be required and can be productive if they are developed and applied consistently in the RTW process.

While participatory approaches are promising for RTW interventions, there is more research required to better design and understand RTW interventions. Durand and colleagues (2007) completed a review of the literature to identify various objectives of RTW interventions and describe the intervention activities. They found 21 published RTW intervention articles using a focused search, including two on interventions with a PE component (Anema et al. 2007; Loisel et al. 1997). The review revealed a great deal of variability among the objectives, content and activities of RTW interventions described. A key recommendation from the authors was that RTW interventions should be better and more completely described. This is increasingly important as interventions link clinical and workplace interventions and move towards including participatory and more tailored approaches. Two additional recommendations, which Durand and her colleagues made, include a concern about the inconsistent use of some RTW terminology and a need for increased attention to process evaluations and outcomes.

The challenge of developing tailored RTW interventions was also raised by Marois and Durand (2009). They examined predictive factors and barriers to RTW in the context of participating in an interdisciplinary RTW program. The findings from this correlational study showed that there were clinical factors (e.g., diagnosis), psychosocial factors (e.g., perception of disability), and work-related factors (e.g., presence of awkward postures) that were related to RTW for both men and women. There were different additional factors for men (e.g., duration of work absence) and women (e.g., failed RTW due to pain levels), indicating the role of gender and other individual factors (Cole and Rivilis 2004). These results point to the importance of determining key factors to create an appropriate tailored intervention. Participatory approaches, with clinicians, workplace stakeholders, and workers involved, may be helpful in this type of tailored approach.

In addition to the need for better description of the intervention components, more quality research should be done to better understand the impacts of RTW interventions. Rigorous methodological designs of studies are needed, despite the challenges of conducting studies in workplaces (Kristensen 2005). Amick and colleagues (2008) describe the challenges of conducting workplace research despite both workplace stakeholders and researchers gaining from conducting research. The authors point out that developing and maintaining teams with workplace stakeholders and researchers is a key element to successful intervention research. With respect to study design challenges, Amick et al. (2008) point out that "one-size" does not fit all, suggesting that researchers use the most rigorous design possible but should keep in mind the context. They go on to point out the importance of meaningful outcomes for both workplace stakeholders and researchers and the need to continue a dialogue throughout to ensure maintenance of the appropriate level of commitment to see a project through to completion. To ensure that interventions achieve their intended impact, ongoing communication is also paramount to promote sustainability of outcomes (Durand et al. 2007).

In summary, participatory approaches can result in more tailored approaches and increased communication among interdisciplinary teams, with ongoing adaptation to interventions, and potentially targeted outcomes. These customized aspects of interventions are generally considered important by all stakeholders involved in the RTW process. Continued attention to and innovation in participatory processes can lead to better RTW interventions and ultimately diminish burden on workers, workplaces and systems.

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Ergonomic Accommodation in Return to Work

17

Sonia Paquette

17.1 Ergonomic Accommodation Definition

There is no standardized definition about what an "ergonomic accommodation" is. Consequently, this attempt to define it uses the two terms it encompasses separately and then combines them: "ergonomic" and "accommodations."

Before defining ergonomics, however, a brief history of the traditional design of work is provided for the reader to understand ergonomics as an added value to job design and redesign. Traditionally, work is designed to meet outcome requirements. For example, tasks and work station designs will differ according to whether the goal of the industry is to manufacture tires, assemble electrical circuits, provide customer service following the sale of a product, or attend to sick individuals. The need for beds, private rooms, or sterilized equipment does not come to mind to even the untrained person when discussing a tire manufacturing company layout, whereas it immediately appears whenever acute medical services are provided. The work of assembling small electrical circuits would lead one to imagine workstations where fine motor work is optimized, and customer service work likely assumes the use of a desk, chair, telephone, and computer. Once the tools and environmental characteristics are identified, the actual layout of the workstations will most likely follow the functions to be performed, along with their task attribution, under the constraints of available workspace and budget limitations. Then, the worker is added to the system and more or less expected to adapt to the work. Obviously, salient human characteristics such as the presence of two arms and the ability to walk and stand on two legs are tacitly taken into consideration. More subtle characteristics, such as reaching distance for location of levers and knobs or the ease of understanding presented information are not so readily optimized.

Furthermore, although disability has been defined earlier in this book, a few salient concepts are reiterated here. One is not "disabled" or "non-disabled." Everyone has some degree of disability when compared to a more capable individual or to someone who works with better-fitting tools (e.g., a chair that makes one comfortable enough to write an entire book chapter). In some cases, the impairment is adequately mitigated by the use of an adaptive device (e.g., reading glasses), or by some kind of routine change in life (e.g., adjusting work hours to accommodate children's schedule, working from home to decrease the interruptions). In this chapter, disability pertains to an individual whose illness or

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injury reduces access to those capacities that could previously be expressed in their work performance. The reader is encouraged to think that "disability," however, is a concept that extends to anybody and depends on the activities and roles in which one participates, not necessarily a mere product of a medical or mental health predicament. Indeed, this chapter is written under the overarching International Classification of Functioning (ICF) framework (WHO 2001), described in an earlier chapter. This framework is based on systems theory, in which all the different determinants of disability are interrelated, such that a change in one component potentially affects many other components. It also implies that a body structure or function does not have to be impaired for a disability to occur: environmental factors including inadequate functional layouts, social stigma, lack of support or personal factors affecting activity participation can, in themselves, be the primary cause of disability.

17.1.1 Ergonomics

Employee selection based on specific human characteristics is often the first line of work/worker optimization. For example, in the mid 1800s, men who were shorter and stronger than average were chosen to become the crew of the submersible Hunley (Meister 1999). Although noble, these attempts to *match the worker to the job* are not examples of the current view of ergonomics, where the goal is to *fit the work to the worker*.

The Encarta dictionary defines ergonomics as the study of workplace design; how a workplace and equipment can best be designed for comfort, efficiency, safety and productivity. In rehabilitation, ergonomics refers primarily to interventions aiming at decreasing the physical and cognitive load of *existing* work tasks in order to better match human limitations, generally reduced following a medical predicament.

The "functional space" where the human interacts with the machine, where the task is executed, is what situates the "functional requirement" of a job. As Anderberg and colleagues state: "Functions are situated in a context, as are obstacles to functions. Functions are located in the space between the individual and his/her surrounding" (2009). Therefore, functional efficiency will be found in that "space," which is influenced by environmental factors. Figure 17.1 visually describes how the person, the task and the environment interaction define the worker's performance and how this performance affects the worker's productivity, safety and comfort. Although this diagram is largely founded in the occupational therapy literature of conceptual models of practice (Law et al. 2005; Turpin and Iwama 2011; Law et al. 2005) from the mid 1970s (Cole and Tufano 2008), its concepts are found in many other conceptual models of disability, assistive device evaluation and delivery services such as the Cook and Hussey's Human-

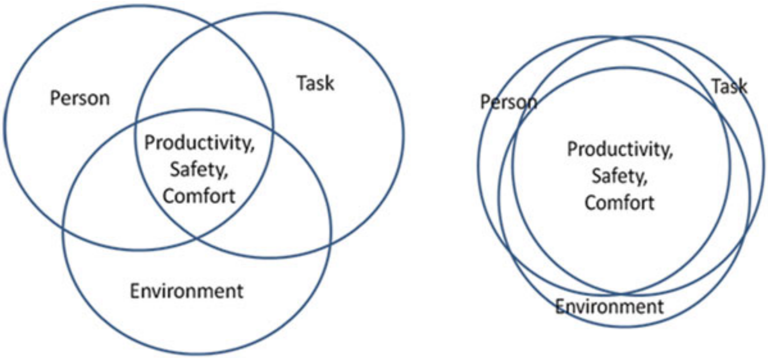

Fig. 17.1 Person-task-environment: Determinants of performance including productivity, safety and comfort can only be identified through careful analysis and fit of the person's, the tasks' and the environment's characteristics. As the fit is optimized, so is the performance

Activity-Assistive Technology model (HAAT), Scherer's Matching Person and Technology Model (MPT) (Lenker and Paquet 2003), and, perhaps most importantly, due to the extensive nature of its universal reach, the International Classification of Functioning (WHO 2001).

Assuming return to work (RTW) occurs within an existing work space and tasks, the term "rehabilitation ergonomics" will be favored in this chapter to indicate both the redesign of a workstation and the retrofit of an existing one while considering physical, physiological and cognitive strengths and weaknesses of a less than optimally healthy human worker in interaction with the work.

The concept of open system is central to ergonomics and, influenced by the ICF and Person–Task–Environment functioning models, permeates the RTW process described in this chapter. Due to the synergistic and heterarchical influence of one system component of the person–work–environment onto any other, changing one element of the system should automatically trigger an analysis of this change's possible influence on another part of the system. For example, wearing a wrist splint to reduce its range of motion can facilitate healing an inflamed carpal ligament. It looks safe enough to overlook the potential effect it might have on the work output or the overall worker's health. However, if the work requirements, layout and tools remain the same and involve wrist movement, such as using a mouse, or assembling and handling objects, this sudden loss of wrist movement will have to be redistributed to other parts of the body. This issue can result in discomfort or even injury to these newly engaged body parts. Inability to regulate the production requirements (e.g., reduce the workload) or modes of operation (e.g., use a different mouse, use the unaffected hand more, use a different tool) may jeopardize the worker's overall health.

Several authors have found employer characteristics to be crucial in the RTW process (Baril and Berthelette 2000; Franche et al. 2005; MacEachen et al. 2006; Stock et al. 1999). Medically followed RTW processes need to consider the following behavioral facilitators which were deemed efficient by employers (IWH 2007b):

1. Having a commitment to safety and health;
2. Offering modified RTW;
3. RTW process involves consideration of preventing overburden for coworkers and supervisors;
4. Supervisors are involved in RTW planning and trained in work disability prevention;
5. Early contact with injured/ill worker;
6. One person devoted to the RTW coordination;
7. Communication occurs among employers, health care providers, and the employee with the worker's consent.

17.1.2 Accommodation

The term accommodation basically means: "something supplied for convenience or to satisfy a need" (Merriam-Webster Dictionary 2012). The same dictionary provides two synonyms: adjustment and adaptation.

17.1.3 Ergonomic Accommodation

Using the above definitions of ergonomics and accommodations, an ergonomic accommodation in this chapter is defined as any adjustment in the way the work is performed in order to fit the characteristics of the individual following an injury or illness. This adjustment may take different shapes: change the sequence of job activities, duration of exposure to a particular task, withdrawal or addition of a task or tool or substitution or redesign of tools, equipment or layouts from those normally provided to employees.

17.2 Purpose of Ergonomic Accommodations

As stated above, the overall goal of ergonomic accommodations is to improve worker performance by increasing safety, comfort and productivity in work execution and output. Workplace modifications target different time lines in the job design and implementation process: before the work task is designed or after. As a preventive measure, ergonomics are involved in design of original tasks, choice of furniture or tool purchase; however, the rehabilitation ergonomist rarely has access to this phase of the timeline. Rehabilitation ergonomics generally take place once there is an identified overexertion occurrence in an existing task, usually aimed at one particular worker.

17.2.1 Safety

Three categories of hazard control have been studied for their abilities to prevent injuries at work: elimination or substitution of hazard through engineering controls, administrative controls, and personal protection equipment (CDC 2011). These hazard controls are useful to consider in the initial phase of assisting a worker to RTW. Further assessment may be required when one or more of these hazards remain. However, even under the best design, an injured or ill worker may very likely need additional assessments. Work design targets a "normal" population, that is, those who are not ill or injured. A less than optimally healthy worker no longer qualifies as "normal" until they fully recover medically and/or functionally.

17.2.1.1 Engineering Controls

Elimination of risk factors is easier at the initial stage of job design. Although the rehabilitation ergonomist is rarely involved at this stage, an illustration of the design and retrofit principles will be provided using the case example of a person with an upper extremity injury working in an industry involving portable sanders, exposing the worker to vibration and hand efforts. When hired in a job where vibration is already minimized at the source through mechanization or full automation of the sanding operations, for example, a worker with an upper extremity injury is more likely to reintegrate the workplace rapidly without harm to his body. This is an example of ergonomic design.

Once a workstation has been designed and is operating, it is possible to modify its engineering specifications, albeit usually at a steeper cost. This is called retrofitting. A person who returns to work following an injury or illness usually returns to an existing workstation, whether the preinjury workstation or another one. Elimination of risk factors at the source during design is no longer possible. However, engineering retrofitting may be an option, and should be considered. This solution requires strong communication and interaction with the engineering or facilities management of the company. However, the end result may not be as effective as integrating engineering controls in the design phase, since substitution is more likely to occur for compromising existing structures.

Retrofitting commonly occurs within industries once problems are encountered in "real life," regardless of whether injuries occurred or not. However, it can concern one particular person who has functional restrictions. In the previous case example of a person with an upper extremity injury, a possible solution might be retrofitting one or two of the portable sanding tools. Replacing a few portable sanders with stationary sanding stations with mechanical help to hold the objects should reduce strength required and vibration exposure. However, this may not completely eliminate vibration exposure and can result in reduced access since many objects may not be transportable to the station. Depending on the irritability of the person's upper extremity condition, it may be possible for him/her to return to this job with limited risk.

Careful weighing of the balance between different risk factors, in this case, substituting vibration for more handling, may be the only implementable option to facilitate a worker's RTW. Compromise, in this case, is the key.

Allowing one worker to work exclusively at the stationary station may be considered unfair to other workers and can trigger problems outside of the scope of strictly ergonomic accommodations. However, these possibilities are real and affect the overall acceptance of an ergonomic accommodation. As good as any recommendation may theoretically be, it will not fulfill its purpose if it is not adopted by the work place. Again, integrating a change in the system, even for safety reasons, usually triggers change in other parts of the system that may not be acceptable to the workforce.

17.2.1.2 Administrative Controls

Administrative controls entail modifying the job sequence or the job responsibilities of the worker. They can take the form of reorganizing duties among workers, reducing or enriching the worker's job duties, reassigning him or her to a vacant position or integrating rotation of tasks to use different physical, physiological or cognitive requirements during the day. Applied to a RTW process, they may also mimic the engineering solution of substitution of one injury risk factor (e.g., vibration) for another (e.g., handling materials) when the tasks already exist. In the case of the worker with a hand injury, should the retrofitting actually cause handling requirements beyond an acceptable risk, administrative controls could involve allowing the injured worker to work at this station on a part time basis to increase tolerance, enriching the task with non-lifting, or having another worker handle the objects. Administrative controls are better accepted by workers when all workers can benefit from their addition. Allowing all workers to rotate in this position once the rehabilitation program is over (or even during) to reduce vibration exposure equally among them may be considered an advantage by everyone.

Administrative controls could also include a temporary assignment of the worker to a less demanding job, a gradual RTW which would affect duration of exposure to risk factors, implementation of additional rest periods or modification of current ones, or a temporary elimination of demanding tasks with gradual reexposure. Using administrative controls such as these in the RTW process has shown to be one of the most effective practices to reduce disability duration (Baril and Berthelette 2000; Franche et al. 2005; IWH 2007b; Stock et al. 1999).

17.2.1.3 Personal Protective Equipment

Personal protective equipment (PPE) offers a barrier between the worker and the risk factor. PPE should be considered the last line of intervention because of its limited effectiveness and burden on the worker.

PPE is relatively easy to implement and inexpensive at first but has been costly to maintain long term (CDC 2011). It may be an ergonomic accommodation aimed at increasing safety during a RTW process due to low cost and general acceptance by the employer. However, in many cases, workers will reluctantly accept the PPE: workers generally have some sense of how much effort is required to implement a different tool, especially if it does not specifically address comfort or facilitate work.

PPE should not be confused with adaptive or assistive devices, with a main goal if enabling function rather than reducing a risk hazard. Therefore, both PPE and assistive devices may be used during work.

However, sometimes, the separation line is thin between an assistive device, PPE and a more ergonomically designed tool. In fact, an assistive device or an ergonomically designed tool, by enabling or facilitating function, may also reduce health hazard by reducing exposure to risk factors, while PPE is meant to protect the worker rather than improve performance.

In our case example, a vibration absorbing gel grip may be recommended to decrease vibration exposure and increase grip on the tool. The gel enhances function by improving grip but also reduces risk through vibration reduction. Table 17.1 differentiates between assistive devices, ergonomically designed tools and PPE characteristics.

17.2.2 Comfort

Although comfort may not be the primary RTW target for the injured/ill worker's insurer or employer, it should be in the mind of the rehabilitation ergonomist. If a new piece of equipment,

Table 17.1 Type, purpose, and example of applications of the different types of accommodations

Type	Purpose	Activity restriction (AR) or health hazard (HH)	Device example
Assistive device	Enables function. Added to the normally used tools.	AR: Unable to read the monitor due to visual impairment	Magnifier software
		AR: Unable to type due to chronic elbow musculoskeletal disorders (MSD)	Dictation software
		AR: Unable to drive with the right leg due to a stroke or amputation	Left side gas pedal in car
Ergonomically designed tool	Facilitates function. Replaces normally used tool.	AR: Difficulty seeing the keyboard while typing	Keyboard with large, high contrast keys
		AR: Pain and fatigue in shoulders when lifting and holding paint container for large items painting	Larger painting container on wheels, staying on the ground, with longer hose hooked on ceiling
		AR: Inability to remember tasks and appointments	Activation of the reminder tool in the calendar application
		AR: Difficulty seeing the monitor display	Use the computer operating system font management feature
Personal protective equipment	Protects from an external health hazard.	HH: Falling objects	Hard hat, steel toe shoes
		HH: working in heights	Harness
		HH: body fluid contact	Gloves, mask, safety glasses

task or tool is not relatively easy to learn, wear or operate, its value will be challenged and it may not be used (Day et al. 2001) The financial, mental, and time costs of learning how to incorporate an additional step, tool or device needs to be less than the advantages of using it. Examples would include the following:

- A task chair maladjusted for a worker who does not know how to operate the adjustment levers and what posture to ultimately attain.
- A powerful software program, which functions are unknown to the user.
- A transfer lifting device too bulky to control in narrow hallways.

17.2.2.1 Assistive Technology

Any ergonomic accommodation in the form of assistive technology or equipment requires training in its use and accessibility. Inadequate training can result in poor device use and, in some cases, abandonment. Factors shown to increase technology abandonment are the lack of consideration of user's opinion in selection, easy device procurement, poor device performance and change in users' needs or priorities (Phillips and Zhao 1993). "Prescribing" a device is not likely to result in comfortable and prolonged use. A client-centered approach is crucial to enhance device usage and satisfaction (Martin et al. 2011; Scherer 2005; Krantz 2012).

Contrary to popular belief, those workers with reduced capacities rarely initiate requests for accommodations (de Jonge and Gibson 2009). Fear of being labeled as a "reduced worker," a "whiner" or a person unable to pull their workload often prevents them from requesting services and devices that may be valuable. Lack of knowledge of services available to evaluate their particular condition and ignorance, or confusion, in the face of such a large variety of equipment or tools aimed at helping them at work can lead to "helplessness." Ultimately, some workers may resolve that the work is more difficult for them and will remain that way, and consequently, remain at greater risk than they should.

Recommending technology or a change in how a person operates their normally executed tasks can initiate problems in other parts of the person–task–environment system and requires follow-up. For example, in the previous case study, recommending a PPE/assistive device such as the gel handle grip may in fact ultimately increase the grip strength required to hold the tool. A proper follow-up helps to determine if the advantages of using the modification outweigh the costs.

Even if the worker's initial response is favorable to the use of the tool, longer term implementation may create unexpected problems which may lead to its abandonment (Lenker et al. 2011; Scherer 2005).

On the other hand, an initial reluctance to implement the accommodation does not necessarily mean that advantages will not eventually outweigh the benefits. Ongoing use through a trial period may reveal unexpected benefits. For example, a worker may be reluctant to include new equipment in his or her regular work tasks and layout, such as a special type of mouse. But once a wrist injury occurs in the mouse-using hand, the hopes of compensating for sudden lack of function or newfound pain may outweigh the original reluctance. Using a new mouse for an extended amount of time to give the wrist time to heal may prove to be more comfortable and provide unexpected advantages, such as an increase in the pointer's precision or a smaller footprint on the working area, which can result in continued use of the mouse, even when the wrist is no longer irritable.

17.2.2.2 Psychological Comfort

Comfort, in this chapter, refers not only to physical comfort in using the tool, but being psychologically comfortable with stigma that could be associated with it, or by "standing out" in a crowd (Lenker et al. 2011). For example, a worker, legally deaf from birth, did not want her coworkers to know about her condition. She had recently been promoted as the coordinator of a global team, with many members outside of her country. Telephonic conferences were common and difficult as coworkers from other countries had accents which made their conversation almost completely out of reach for her. She had mastered the task of lip reading, but was not able to use this skill in telephonic conversation. Neither could she when people turned their faces away from her when speaking, or when many people spoke at once in a room. The event that led her to ask for consultation was a recent performance review, in which coworkers complained that she was not attentive to them, was rude by leaving in the middle of a conversation or not even responding to their friendly hello in the morning. This was devastating to her. Reaching out for a consultation was extremely difficult, but she initiated it: the pain of this poor performance review was stronger than her reluctance to ask for help.

After initial interview and data collection, it was clear that she was misperceiving her request for accommodation as asking for an "advantage" over her coworkers, and did not see it as fair. She misunderstood the use of a mitigating device as a privilege, not as a mode to bring her up to par with normally hearing individuals. A special hearing aid was identified and purchased. She agreed to make a humorous sign on her office door asking people to knock progressively harder if she did not answer and make themselves visible by entering her office and waving, if the harder knocking still did not work. She also obtained a "rear view" mirror for her computer monitor, which allowed her to avoid relying on her hearing to notice someone coming behind her so she could greet them accordingly.

17.2.2.3 Pain

Workers with musculoskeletal disorders (MSD) and those with residual functional limitations are more likely to need more recovery time between tasks than healthy workers (Hagberg et al. 1997). Inflammation in tissues is known to affect physiological tolerance, especially in MSD (Barr 2004). A wide range of illnesses and injuries are associated with mild to extreme fatigue, resulting from a variety of factors such as physiological, psychological and cognitive changes (Evans and Lambert 2007). Muscle recruitment patterns change in the presence of pain (Hodges et al. 2008; Madeleine 2010; Shadmehr et al. 2012) or even in its mere anticipation (Tucker et al. 2009). This knowledge should encourage the rehabilitation practitioner to plan and implement extra scheduled breaks to facilitate recovery and pain reduction during the RTW, guided by the worker's tolerance, motor and overall performance during prolonged, repetitive or intense tasks.

Although health professionals typically find it difficult to work with a client with heightened pain behaviors (Martel et al. 2012), a rehabilitation ergonomist is encouraged to use disclosure and validation techniques with the worker to reduce the anxiety associated with the unknown pain impact of engaging in work activities (Sullivan 2012). Realizing that his or her pain concern is taken seriously, the worker can hopefully better focus on functional restoration.

17.2.3 Productivity

The goal of ergonomic rehabilitation is not only to increase safety and comfort, but also productivity of the returning worker. After injury or illness and absence from the workforce, workers often present with fears and concerns about their safety comfort and productivity. A temporary decrease in productivity is expected when a worker returns to work. When planned and, especially, acknowledged by the employer, this reduced productivity requirement allows for a larger margin of maneuver and improvement in RTW outcomes (Durand et al. 2009). The extent of this reduced productivity depends on the severity of functional limitations as compared to the requirements of the tasks and their intrinsic propensity to be modified. It also depends on the expectations and adaptability of the workplace. Again, characteristics of the person, task and environment are intimately related in optimizing performance.

As seen in Fig. 17.1, tenets of ergonomics and functioning include safety, comfort and productivity as the determinants of performance. Therefore, as safety and comfort increase, so should performance, likely yielding an augmentation in productivity. Using the example of a mouse substitution, pain and risk factors are reduced, positively impacting comfort and safety. Allowing for longer duration of task exposure then increases productivity. The added pointer's precision also helps reduce the number of movements to navigate the screen, freeing time and decreasing achy soft tissue solicitation. The same can be said for a comfortable chair or car seat, which allows the user to sit for longer periods without discomfort. Rest-break schedules, in particular, are known to have an effect on worker's overall productivity for physically demanding jobs (Fisher et al. 1993; Janaro and Bechtold 1985). For example, working until it hurts and then taking a break does not have the same risk prevention power as taking regular and timely breaks during a demanding task. Having workers work "until it hurts," especially when there are fears and concerns about pain, is equivalent to asking a dog-fearing individual to play with one until it bites!

Despite the existence of a number of complex equations for work/break periods in repetitive work tasks (Fisher et al. 1993; Janaro and Bechtold 1985; Potvin 2012; Wood et al. 1997), they can only be used as a guideline for injured or ill workers. No equation currently exists to calculate additional breaks and recovery time required for less than optimally healthy individuals. However, using healthy guidelines and multiplying them by a safety factor determined by the worker's tolerance and the requirements of the job in terms of frequency, intensity, duration of physical demands, and type of loading (static versus dynamic) should help to design work/rest schedules facilitating a safe and comfortable RTW process that enhances rehabilitation outcomes (Duquette et al. 1997).

17.3 When Should Ergonomic Accommodations Be Considered?

17.3.1 Type of Prevention: Primary, Secondary, Tertiary

Ergonomics can be used as primary, secondary and tertiary prevention of injuries or illnesses, work-related or not. Although ergonomics have been largely involved initially in primary prevention, this chapter focuses on secondary and tertiary prevention due to its RTW focus after an injury or a disease. Table 17.2 defines types of prevention and gives examples.

Table 17.2 Types of prevention, purpose and examples (adapted with permission from the Institute for Work & Health 2006; www.iwh.on.ca)

Type of prevention	Purpose	Examples in public health	Examples in ergonomics
Primary prevention	Prevent an injury or illness to occur in the first place. Primary prevention usually targets risk factors associated with injuries or disease.	Immunization campaigns	Ergonomic design of a workstation, considering the characteristics of the human worker, the task functions and the environment, in order to minimize its health hazard
Secondary prevention	Halt or slow the progress of disease (if possible) in its earliest stages; limiting long term disability and preventing aggravation of illness or reinjury. Secondary prevention usually involves acute rehabilitation to maintain capacities or prevent their deterioration.	Recommendation of low dose aspirin to reduce risk of cardiovascular disease after an episode of angina	Assessing needs and providing resources to help workers stay at work or RTW after an injury or a disease
Tertiary prevention	Help manage long term consequences of chronic health and conditions. In rehabilitation, tertiary prevention may involve intervention in the community, where the person lives and work.	Implementation and maintenance of support groups for chronic pain	Ongoing surveillance of discomfort and risk factor identification aimed at people with chronic or severe conditions. Recurrent evaluation of the pertinence of modifications.

Traditionally, in rehabilitation, ergonomic accommodations are used in secondary and tertiary prevention, typically in form of assistive devices or tool modification (Scherer 2005; van Eerd et al. 2010). When appropriate, rehabilitation ergonomists should consider factors beyond the immediate person–task interaction including environmental, organizational and administrative factors. Obviously, changing a rest-break pattern, a working schedule or even allocation of a temporary job to facilitate RTW will impact employer schedule and organization more than integrating a device in the space between worker and task. However, these kinds of administrative accommodations are usually more readily accepted by the worker, perhaps because worker participation in RTW is strongly influenced by the worker's belief that the employer cares about the worker, the worker's safety and addressing his/her needs (Stock et al. 1999). That an employer agrees to implement recommendations requiring flexibility on their part is perceived by the workers as a tacit acknowledgement of his or her needs. Therefore, a thorough analysis of worker needs as well as the employer's ability to accommodate is required before suggesting changes. Including all the stakeholders in the RTW process traditionally makes the outcome more favorable (Baril and Berthelette 2000; Driessen et al. 2010a; Stock et al. 1999, 2005).

17.3.2 Participatory Ergonomics

Consulting with industry requires awareness of its complexity. Looking through the lens of specific ergonomic risk factors and recommending engineering changes without understanding this system system will likely result in an inability to implement the recommendations, or in a recipient's disbelief as to their efficacy. Task design and redesign requires a thorough understanding of the system in which the task belongs and of the design process, including ergonomic design with a Universal Design perspective (covered in another chapter).

The ergonomic process goes beyond assessment of functional space between worker and task, and should precede making large scale recommendations, such as changing a machine, a tool, or a mode of operation. Rehabilitation professionals without ergonomic training in work design are typically not adequately prepared to suggest such changes. However, they are in a good position to identify the need for such an assessment.

Because of the systemic nature of work and its constituents, the terms and processes of participatory ergonomics made their way in primary prevention and, to a lesser extent, rehabilitation (secondary prevention) literature. The Institute for Work and Health (2007a) (IWH) defines participatory ergonomics as follow: “In participatory ergonomics (PE), a team works together to identify risks, and change tools, equipment, and work processes to improve workplace conditions.”

Higher level evidence research papers produce mixed results with regard to the impact of PE on health related outcomes for primary prevention of musculoskeletal symptoms, with more positive results noted for rehabilitation efforts (Driessen et al. 2010b, 2011b; Goodman et al. 2005; Martimo et al. 2010; Pillastrini et al. 2010; Rivilis et al. 2008).

A systematic review focusing on the financial merits of ergonomic interventions for the employer (not particularly via a participatory focus) indicates a strong evidence for a positive impact in manufacturing and warehousing, as well as moderate evidence in administrative and health care sectors (Tompa et al. 2010). In many research papers, psychosocial variables and productivity outcomes have been shown to be positively impacted by ergonomic interventions (Driessen et al. 2011a; Martimo et al. 2010; Robertson et al. 2008). Some case studies anecdotally support that enhanced safety and comfort through ergonomics increased productivity (Larson 2012).

17.4 Types of Ergonomic Accommodations in the Return to Work Process

17.4.1 Accommodation Prioritization

Table 17.3 offers a list of work accommodation offers that have been found to better promote rehabilitation success during the RTW process (Stock et al. 2005):

Table 17.3 Prioritization of work accommodation assignment. Adapted from Stock et al. (2005)

Keep the worker at his or her regular job and modify the tasks.
Transfer the worker to another job in the same department.
Transfer the worker to another job, in another department.
Add the worker as a supernumerary worker (sometimes called “shadow” worker).
Provide training.

In all these cases, the worker’s regular task is changed either peripherally, as when maintaining the same job with some modifications, or at its core, when assigned to another job. Interestingly, it has been found more efficient for work disability duration reduction to assign the worker to a job physically close to his or her original job, rather than having a similar job to the worker’s previous one but in another department (Stock et al. 2005). This observation lends support to the importance of social and organizational factors in RTW outcomes.

For workers with cognitive problems following a disease or an injury, the energy and capacity cost of learning a new job, performing new tasks or working in a less familiar environment may override the potential advantage of reintegrating to the workplace. Using the previous work as the reintegration goal is strongly recommended to increase the chances of success.

Stock and colleagues (2005) prioritize the first alternative in Table 17.3 before choosing subsequent RTW assignments for people with MSD. The regular job of the worker not only becomes the target of the RTW outcome, but also the means. The use of the goal task as a rehabilitation modality is a core value in occupational therapy (Fisher 1998; Pierce 2001). For most cases, modification of job tasks is necessary, where application of ergonomic principles is central to success. The following section will describe how to apply these principles to job modification.

17.4.2 Ergonomic Principles in Accommodation

17.4.2.1 Frequency, Intensity, and Duration

In establishing a work accommodation opportunity, physical and cognitive demands are important to identify. Three job demands properties have been identified as central: frequency, intensity, and duration. The demands properties have long been used by exercise physiologists to improve athletes' levels of fitness. By gradually increasing the frequency, intensity, or duration of a specific exercise, "overload" occurs, which means that capacities are challenged: this is the basis of athletic training and rehabilitation (Plowman and Smith 2010). On the contrary, by reducing physical or cognitive demands of work task properties of frequency, intensity, and duration when worker capacities have reached a plateau and the rehabilitation goal shifts to the need for environmental accommodations, performance improvement should occur, because worker capacities will then be sufficient to fulfill demands.

These three properties are intimately related but need to be targeted individually. Many times, the effect of modifying one of them is sufficient to maintain a worker at work, even if the task is not completely removed or the risk factor eliminated. Functional restrictions are based on affecting these properties. For example, a manual handling restriction to 10 lb directly targets the intensity of the task.

For the rehabilitation professional attempting to facilitate a worker's RTW, identifying the presence of high task demands is not sufficient. The rehabilitation process requires that the task be further analyzed. Each effort, posture and cognitive demand needs to be qualified by its properties of frequency, intensity, and duration. For example, in driving a car, the cognitive demands required for turning left on a crowded street are higher than turning right on the same street (Hancock 1990). By further analyzing different left turns around the route, a modified route may be designed with easier left turns, or additional right turns, so that a cognitively impaired driver can continue participating in related activities.

Table 17.4 provides examples of questions aimed at analyzing task overexertion in the two above examples, assuming physical factors are the culprit of overexertion in gripping, and cognitive factors in driving.

Table 17.4 Question examples for analyzing overexertion in gripping and driving task

	Gripping (physical overexertion)	Driving (cognitive overexertion)
Intensity	How much effort is exerted? What is the size of the handle? How does the hand fit on the object? Is the object slippery? How familiar is the worker with the task?	Is the street/highway crowded? Is the driver familiar with the area? Is the driving occurring during the day or night? How tired is the driver? Is there distraction in the car?
Frequency	How often?	How many left turns? How many school/low speed zones? How many familiar/unfamiliar zones? How often is driving required during the day/week?
Duration	How long each time? How quickly? How long over a period of time (e.g., over an hour, a day, a week)? How long are the recovery periods between each gripping period? How long are the gripping periods themselves?	How long each time? How long in each zone? How long at night? How long in the day?

In the first row labeled "intensity," note that one of the questions pertains to the familiarity of the worker with the task. Research has repeatedly shown that novices exert more effort and make more mistakes than experts, both in the cognitive and physical realm, and in all walks of life (Ahmed and Babski-Reeves 2012; Burger et al. 2010; de Kaveagam et al. 2011). It is common knowledge that performance improves with familiarity with the task: "practice makes perfect"! This is a common principle in music and athletic performance, as well as the basis for rehabilitation. Cognitive psychologists and ergonomists believe that, as the worker is repeatedly engaged in the same task, "pattern recognition" replaces the trial and error performance approach (Weber and Aretz 2012), which ultimately reduces the task's overall demands.

17.4.2.2 Intensity

Intensity pertains to the amount of strength deployed, the amplitude away from the neutral posture of limb joints, the effort required to reach or grab, and the number of simultaneous tasks or the complexity of the motor or cognitive process to perform. In a material handling task, for example, only influencing the amount of weight may not be sufficient because it is not the only determinant of intensity. In particular, the quality of the grip of the object, the vertical and horizontal distance of the hands from the body's center of mass, the distance to travel with the object, the ability to see above the object, the stability of the object and the friction between the floor and the worker's feet, are all determinants of the intensity of the manual materials handling requirement. Furthermore, in order to handle an object, one has to access it: in workplaces, handling a box or a bag may not be as hard as getting to it in the first place.

Therefore, for RTW task modifications, reducing intensity of physical demands may involve reducing the weight of the object or distance traveled in a manual handling task, reducing the clutter to get to an object, or improving the grip of an object or a tool. For cognitive demands, it may involve presenting one instruction at a time, eliminating visual and auditory distractions, removing unfamiliar or more confusing tasks, physically structuring the task a different way and including it into a routine, or exploring a different modus operandi for a task. Because of their relationship with each other, reducing either of the other two properties (frequency and duration) will also have a reduction effect on overall strain.

By eliminating unnecessary movements or static postures, the intensity of physical demands could be reduced. However, a word of caution applies: withdrawing certain "idle" or "unnecessary" movements may eliminate their associated rest benefits. For example, waiting for a webpage or for a software program to open may be associated with a rest period between repetitive bouts of typing and mousing, allowing the worker to stand up or stretch from a prolonged standing position. If this "unnecessary" waiting period is removed by reducing the software or website loading time, this rest period is no longer available to the worker.

17.4.2.3 Frequency

Frequency is defined as the rate at which a function reoccurs, or the number of occurrences within a given period of time. The common way to describe a reduction in frequency is to "slow down." To maintain the same performance in a task, reducing frequency will automatically require longer duration, or higher intensity. For example, rather than lifting one box per 30 s, one may be asked to lift two boxes every 60 s, yielding the same productivity. However, this request may create a substitution of risk factors: where frequency was the culprit, intensity may now be of concern. Therefore, during rehabilitation, productivity reduction is expected since overall work demands initially require reduction. Repetitious work, when performed at a slower pace, reduces physical demands. But reducing frequency while maintaining requirements for productivity may actually increase work demands: to effectively reduce frequency to meet rehabilitation objectives, the other properties (intensity and duration) need to remain the same or be also reduced. During rehabilitation, productivity loss is to be expected temporarily.

17.4.2.4 Duration

Duration is the amount of time an activity is performed. Often, the first line of accommodation proposals consists of a modification of the duration of exposure to work. Gradual RTW programs, starting at a few hours per day a few days per week, count on adding hours to the work day to facilitate endurance improvement. Sometimes, gradual RTW programs only rely on gradation through duration exposure. And, often, it is sufficient.

It is important to differentiate between continuous duration and cumulative duration. For work tasks, reducing the duration at one time and repeating the same task at another time during the day may be sufficient to decrease the challenge of task demands on capacities while maintaining overall duration and, possibly, productivity associated with the task. For example, a shipping clerk may be required to receive and shelf boxes during 1 h in the morning, but considers it too much of a strain. In this case, if possible, dividing the task into two periods of 30 min, or 3 of 20 ± 5 min (to allow for the time cost of switching activity) may make it more manageable for the worker.

Addressed earlier in this chapter is the importance of scheduled breaks, which is intimately related to continuous duration of work. Adding scheduled breaks as the work is becoming more intense, frequent or prolonged is necessary to avoid fatigue, which may lead to injury (Evans and Lambert 2007). Modifying the work/rest schedule has been found to be effective in RTW rehabilitation success in some sectors (Goodman et al. 2012).

17.4.2.5 Other Considerations: Stress and Strain

Consider the following question: Which is heavier: 20 lb of lead or 20 lb of feathers? The most rational thinkers will claim that they are the same weight, which is true. Those who immediately imagined themselves having to transport that weight will quickly conclude that the lead is "lighter." In a way, it "is," because it is easier to carry than a bulky 20 lb of feathers.

This example illustrates the difference between "objective" and "subjective" work task demands, or *strain* and *stress* as called by the German ergonomist Rohmert (1986). *Stress* describes the "objective" characteristics associated with the task itself, regardless of the worker, such as layout, tasks, weight, repetition and tools' features. *Strain* is the result of the comparison of task characteristics on worker performance feasibility, considering the worker's physiological, physical, biochemical, and psychophysical characteristics. Rohmert makes the distinction between the external description of physical characteristics of a task (stress) and the impact its execution has on a worker (strain), a distinction that impregnates the French language literature in ergonomics but not highlighted as prominently in the English literature.

In rehabilitation, the stress/strain concept is particularly important, since the goal of a RTW process is to successfully return a worker to sustained employment. Considering the reduced tolerance of the worker resulting in a reduction of the work requirements at first, *strain* need to be considered and compared against the *stress* of the work. Otherwise, sustained RTW will likely fail. The more comfortable the margin of maneuver, the more access the worker has to self-regulating strategies, and the more successful should be the RTW outcome.

Notice that strain should not be absent. This would defeat the rehabilitation purpose of a RTW process, in which "overload," in the exercise physiology sense, needs to occur for capacities development. The right balance between work stress and worker capacities will determine the appropriate amount of strain necessary for relevant rehabilitation results.

17.5 Applying an Ergonomically Based Algorithm to Return to Work for People with Physical Problems

During the RTW process, returning to the previously held position is usually the ultimate goal, and also the most efficient means to the goal.

The process described in this section focuses on people with MSD. With some adjustments, it can be applied to other types of medical conditions as well.

For workers with cognitive difficulties, the risk factors are obviously different, but the basic application of reducing the intensity, duration, and frequency of the work demands, and the algorithm presented in this section can be used successfully. Cognitive demands analysis is not covered in this chapter.

Enhancing the positive RTW outcome for a less than optimally healthy individual requires more than matching the worker's reduced functions to some kind of accommodation. It requires careful planning and involves many stakeholders. In particular, supervisors whose primary responsibility is to reach daily production requirements may resent company regulations to integrate less than optimally functioning workers since it directly competes with their primary function. Upper management should officially acknowledge this dichotomous outcome responsibility as part of the supervisor's performance evaluation, and allow for some flexibility in the production requirement (IWH 2007b).

Assessing whether a position has health risk factors for an individual with MSD starts with estimating the physical demands of the work. This process should be made in consultation with the worker, ideally through a job trial. Results are then used to compare the worker's strengths and weaknesses in light of the job requirements, as executed by the worker.

To facilitate navigating all the physical requirements of work, the Institut de Recherche Robert-Sauvé en Santé et Sécurité du Travail (IRSST) in conjunction with the Montreal Public Health department published the "Tools for Modified Work" (TMW) aimed at assisting employers to help workers stay or RTW in a timely fashion within 90 days of a MSD onset (Stock et al. 2005).

In this work, risk factors known to cause or increase an existing injury were identified and classified according to injured body parts for the neck and shoulder, the elbow, the wrist and hand, and the back. Table 17.5 lists the 11 worksheets designed by the authors to address some of the primary barriers to RTW. Inhibitors to successfully implementing RTW programs, expressed by the employers themselves (Stock et al. 1999), were targeted by the three categories of tools. In summary, the employers' main complaints were:

Table 17.5 Description of worksheets and categories in the TMW guide. Adapted from Stock et al. (2005)

	Back	Neck and/or shoulders	Elbow(s)	Hand and/or wrist
Estimate of physical work demands	X	X	X	X
Temporary work restrictions	X	X	X	
Modified work proposal	X	X	X	X

- They do not know how to implement RTW programs.
- They do not know how to choose and assess appropriate tasks.
- Communication with medical providers is sketchy at best, and when it occurs, is hard to understand or apply.

Therefore, the worksheets designed and included as part of the guide aim at helping employers with the following tasks:

- Assessing the physical demands of any work tasks according to the risk factors associated with a body part.
- Communicating with the medical provider.

The guide also includes a RTW program creation and implementation process.

Whether initiated and followed up by the employer or provided through an outside rehabilitation provider, the RTW process implies four major steps, as follows.

17.5.1 Identify the Body Part

Using the list in the column headings of Table 17.5, the proper injured body part is identified, which will help select the proper worksheets.

17.5.2 Choose Work Tasks to Assign

Aware of the risk factors associated with an aggravation of injury for this body part, a specific set of work tasks is chosen for the RTW assignment. Again, it is strongly recommended that the selection process starts with the worker's previous position. If this is not possible, the elimination process should follow the list provided in Table 17.3, constructed under the principle that keeping a worker physically closer to the previous position should yield a more timely RTW.

17.5.3 Estimate the Physical Work Demands

Once the work tasks are identified, estimating their physical demands in relation to the injured body part is required. Using the forms and the guide for support, and with input from the worker, a workplace player knowledgeable about the work tasks (for example, a supervisor or a coworker on the safety committee) can evaluate the tasks with regard to known risk factors for this body part.

For example, in the case of an injury to the hands and/or fingers, the estimator would use the form entitled "Estimate of physical demands for workers with hand or wrist problems." This way, risk factors associated with hand or wrist injury aggravation will be targeted and the assessment will be more focused.

17.5.3.1 Work Task Analysis

A work task analysis aims to understand the work, and divide it into manageable components to identify its physical and cognitive processes. If an external consultant is involved, or someone unfamiliar with the tasks, a thorough task analysis needs to be performed. Table 17.6 provides a list of five simple but too often overlooked questions that build on traditional ergonomic methodology in activity analysis (adapted from S. Simoneau personal communication July 18, 2012).

The same methodology for task analysis and for RTW service provision applies for persons with cognitive difficulties. Comparing the overexertion instances with the functional limitations of the worker (*strain*), and integrating this knowledge in the global system of the workplace, will allow identification of possible solutions, regardless of the impairment source (cognitive or physical) of the misfit.

Once the demands are identified, the analyst, the worker and an employer's representative look for areas where the demand is considered strenuous for the worker. In RTW, notoriously difficult tasks for all workers should not be considered. Once a cluster of tasks is identified, estimating demands follows. Then, ways to decrease higher demands need to be identified and implemented, and, if impossible, the task discarded. Should too many tasks be discarded in one cluster, another cluster of tasks should be chosen and analyzed the same way.

Once the proper cluster of tasks is chosen, it should be assigned to the worker. In the case of an employer-initiated process, it is recommended to follow up within the first few hours, days, and then, every 1 or 2 weeks. The assignment should be monitored in conjunction with the worker's health professional. If an external rehabilitation consultant is involved, it is strongly recommended that the RTW program include a timeline for completion from the start, stating objectives for each week, as well as tasks assigned with their expected frequency, intensity, and duration.

17.5.4 Follow-Up and Evaluate Modified Work Assignment

Once assigned to work tasks, the worker should be allowed to work a few hours and then immediately benefit from a follow-up. The worker should be assigned a person to call in case of major difficulty in the first few hours of RTW. Task modification implementation, assistive device recommendations and ergonomically designed

Table 17.6 Ergonomic task analysis methodology applied to health and safety concerns

Question	Rationale
What is the work to do?	A worker's job duties include job tasks, which, through their execution, involve motor and cognitive processes. Motor and cognitive processes are the expression of the inherent capacities within a specific set of work physical and cognitive demands. These motor and cognitive processes, including their frequency, duration, and intensity properties, can only be identified in the functional space between the person and the task.
How is the work done?	In this case, the analyst needs to observe the task while it is being performed, not "modify" it by asking the worker to adopt certain postures, sequences of operation or by changing the physical layout of the work. The way work is done is very individualized: observing two individuals doing the exact same job will almost invariably result in significant variations in modes of operation. It is recommended to increase the sample size by observing and interviewing more than one worker performing the job. This will ensure exposure to a wider repertoire of methods to approach the task and, therefore, increase the accuracy of the analysis. The goal is to find how the workers operate: this is called "modus operandus" or "operandi" (plural) in Latin, a term often used in ergonomics.
Why are the workers working this way?	In this step, the intent is to find what *determines* the workers' modus operandi. Before rehabilitation professionals offer suggestions to improve the way the work is done, they should ask an *open* question of the worker: why do you take this object this way? Why is the sequence of operation following this particular one? Why is the layout the way it is? Sometimes, the answer reveals insight into the process beyond the immediate task.
Where and what are the difficulties encountered in the execution of the work?	The goal is to find where the requirements may become overwhelming when compared to the capacities of the worker. Even to the trained eye, it can be almost impossible to prioritize the difficulties encountered at work absent the input of the workers. Despite a good reliability between the relative prioritization of a list of risk factors between workers and trained analysts, the final ranking may be different when compared to the workers'.
How can the overexertion be eliminated or reduced?	Once data is collected on what the tasks are, how they are done, why the workers operate this way and where they find difficulties in the tasks, *then, and only then*, can solutions be proposed. Workers are typically not very good at analyzing *why* they have difficulty with a task. However, they know *when* and *under what circumstances* those difficulties arise. The analysis process can start by identifying these moments of difficulties through the worker's report and/or observation. The next step is identifying the determinants of these difficulties. For physical problems, it will result in a combination of effort and/or posture along with their frequency, intensity and duration properties. Solutions should be brainstormed with the worker(s) to modify the components in order to make the work more manageable. When involving engineering or administrative control changes, a representative of the employer should be involved. Often, recommendations appear perfect in their ability to directly reach the target risk factors, but cannot be implemented. A less efficient, but implementable, solution may need to be considered.

tools should be evaluated for fit, performance impact and appropriateness. For an external consultant, weekly visits are recommended. More frequent visits are appropriate if the situation presents with additional complexity, such as when the worker has been disabled from work for many months or the employer's climate is not the most favorable to rehabilitation. The consultant should be available by phone during working hours in case the worker has a pressing question. Follow-ups also ensure the RTW process is neither too hard nor too easy and that progress is being made for the ultimate purpose or returning to preinjury duties.

17.6 Best Practices

This section represents a summary of best practices when proposing ergonomic accommodations, as explained in detail in this chapter.

- Use a client-centered approach.
- Evaluate the person–task interface, as well as the environment.
- Consider both stress and strain.
- Consider assistive technology, administrative controls and, if necessary, further analysis for engineering control modifications.
- Follow up on recommendations implementation: if not implemented, reevaluate recommendations and modify according to feedback provided.
- Once recommendations are revised and implemented, follow up on worker's health response to program, work output and reaction from coworkers and supervisors to the RTW process.
- Involve appropriate stakeholders, including supervisor, case manager, treating physician, counselor, physical or occupational therapist or chiropractor, coworkers, and health and safety committee in program development.
- Maintain ongoing communication with stakeholders during the RTW process.
- When appropriate, recommend a complete engineering/ergonomic assessment when risk factors affect the overall workforce.

17.7 Conclusion

The ergonomics specialty aims to better match the work with the worker. Whenever the risk of overexertion is present at work, an ergonomist can and should be consulted. Whenever this overexertion affects a worker with a disease or an illness, an ergonomist with a background in rehabilitation, or a rehabilitation professional with a solid foundation in ergonomics should be involved. Knowledge of medical, functional, rehabilitation, and ergonomic concepts is crucial to prevent aggravation or new injuries/illness during a RTW process, and to avoid the unfortunate consequence of an extended work disability.

Rehabilitation ergonomics includes influencing a favorable RTW outcome through the assessment and analysis of:

1. *The person*: a worker's capacity reduction, as well as his or her strengths. Overlooking strength assessment is closing the door to a large repertoire of readily available compensatory strategies belonging to the worker and necessary to mitigate the lost capacities.
2. *The task*: the nature, purpose and components of the work tasks. Although ergonomics has often been associated with biomechanics, it goes beyond this important foundation. Understanding the purpose of the task and how the worker perceives it and operates it, allows the rehabilitation ergonomist to better identify areas that can be modified and those that are not. A rehabilitation ergonomist should be skilled in the following tasks:
    (a) Breaking down the job into tasks, the tasks into elements;
    (b) Analyzing task elements to extract the cognitive and motor processes involved in execution of work;

   (c) Weighing those processes according to their frequency, intensity, and duration, and
   (d) Identifying determinants to target factors responsible for the misfit with implementable solutions, using a participatory approach.
3. *The work environment*: its culture; its standard operating procedures with respect to work reintegration in particular, as well as health and safety in general; the treatment of employees; the relationship between management and workers; and the presence or absence of stigma associated with disability.

The interaction between person and task is of primary importance to identify those instances of extra strain. When finding solutions, consideration of the work environment yields a higher probability of implementation and success.

In this chapter, a RTW algorithm was proposed with a focus on identifying the strain experienced by the worker to diminish its magnitude and facilitate the worker's safe, comfortable, and productive RTW. Best practice recommendations, based on this chapter's content, were also proposed.

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18

Working with Stakeholders in Return to Work Processes: Multisystem Interactions

Lynn Shaw

18.1 Stakeholders in Return to Work

In the occupational health and safety literature on return to work, return to work (RTW) stakeholders are commonly classified into five groups: workers, employers, payers, health care providers, and government/society (Young et al. 2005). Typically, they are known to enable workers to resume or return to work after a work disruption due to illness or injury; they are likely also involved in a critical aspect in the return to work trajectory across the health, social and work sectors/systems (multisystem) (Brunarski et al. 2008). They may include (1) health care professionals such as doctors, chiropractors, occupational therapists, physical therapists, kinesiologists, psychologists, nurses, (2) social services sector workers, including social workers, social services personnel, and unemployment service workers, (3) workplace sector players such as vocational rehabilitation providers, return to work coordinators, human resources managers, benefits coordinators, health and safety coordinators, union or worker representatives, managers, coworkers, and of course, (4) the worker, and (5) his or her family.

A number of articles in the last decade, predominantly from Western world countries such as the USA, Canada, Sweden, and the Netherlands, have outlined stakeholders' roles and perceptions in RTW. Research describes the roles of physicians (Reynolds et al. 2006; Soklaridis et al. 2011), employers (Larsson and Gard 2003), workers (Ouellette et al. 2007), supervisors (Holmgren and Ivanoff 2007), and vocational rehabilitation professionals (Dekkers-Sanchez et al. 2011). Such roles and responsibilities are not necessarily universal or applicable to all countries and thus a RTW community of practice (that involves multiple stakeholders) with differing priorities necessitates the need for a contextual understanding of how interactions transpire to support cooperation.

This chapter will focus on the RTW stakeholders, specifically the individuals or representatives of the organizations or agencies that ensure that the worker's right to RTW and that the approaches are tailored to the individual and workplace needs. Some workplaces have adopted the framework of Disability Management or workplace disability management as introduced by Tate (1986); this is more formally introduced in occupational health literature to prevent primary and secondary work disability (Shrey and Lacerte 1995).

In disability management, RTW is one program within work disability prevention, which aims to reduce costs with workers (i.e., loss of work) incurred through work transitions or

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ongoing, recurrent or new disability experienced by employers and society (Dyck 2002). Loisel et al. (2001) emphasized the collaboration and interactions of workplace, health and insurance stakeholders in participatory ergonomics approaches; these strategies are used in the treatment and interventions to support RTW for persons with low back pain. Others, such as Brunarski and colleagues (2008), suggested that RTW in rural or smaller communities without access to formal work based approaches could be virtually organized and enacted by stakeholders. Thus, multisystem interactions have been the cornerstone of workplace return to work programs for over 20 years; however, enacting these programs is a complex undertaking (Brunarski et al. 2008).

Given the multiple stakeholders involved in RTW, it is understandable that their interests may be different depending on their agency or organizational goals/priorities. Moreover, the active participation of stakeholders in the processes of RTW will also vary, as noted by numerous authors and studies on the topics of interaction, cooperation, and collaboration (Dyck 2002; Harder et al. 2006; Shaw Wong et al. 2008; Hees et al. 2012; Leyshon and Shaw 2012; Reynolds et al. 2006). Participation of stakeholders also varies overtime. For instance, in some settings, physicians were expected to have a passive role and in other settings, they were expected to become more actively involved in communication and collaboration with workers and workplaces in RTW (Reynolds et al. 2006). Similarly, participation of workers was traditionally limited to be passive recipents of information and they were excluded in discussions about transitional work planning between health care providers and employers (Korzycki et al. 2008). In other settings, worker involvement occurred through a third party, such as a union or worker representative (Shaw et al. 2009a).

Active roles of stakeholders in RTW include those involved in a formal disability management program aimed at secondary work disability prevention, a participatory ergonomics program, or a workplace based return to work coordination program. They may be directly involved with the worker in the preparatory stages of planning, decision making, and monitoring of a timely return to work (e.g., workers, employers, and health care providers), the actual implementation and monitoring during the transition, the evaluation of outcomes, and, finally, the ongoing success (e.g., supervisors, return to work coordinators, coworkers, workers representatives, and rehabilitation providers). Other stakeholders may have more of contributory or consultative role of providing information or knowledge to inform RTW processes/interventions (e.g., insurance payers, unemployment agents, or social services funders regarding accessibility needs and equipment) or other outcomes such as the prevention of secondary work disability (i.e., prevention of reinjury to workers through enhanced safety and ergonomic practices). Others, such as human resource benefits administrators, still may be less active in the actual return to work interventions but concerned with cost containment issues and focused on the timing and duration of return to work transitions.

Literature suggested that differing paradigms or priorities of stakeholders may contribute to the lack of a shared view as an active player or contributor in the return to work processes, and/or the beliefs about the rights of stakeholders to participate in the process or receive information (Franche et al. 2005; Shaw et al. 2008; Young et al. 2005). Thus, it is critical to understand (1) who the stakeholders are, (2) their expectations for outcomes, (3) the policies that impact return to work management, and (4) which stakeholders are needed in an active versus contributory role. In addition, Dyck (2002), Jodoin and Harder (2004) and Pransky et al. (2004) asserted that determining processes that address the complexity of multisystem and stakeholder participation are necessary to avoid conflict related to competing interests and differing expectations regarding support, trust, and communication.

18.2 Return to Work and Multisystem Interactions as Contextually Situated

One way to enhance group interactions is to acknowledge that RTW processes are socially constructed and contextually situated. For instance, historically, stakeholders that have interacted within a workplace, municipality, or region have contributed to the ongoing nature of relationships and subsequent expectations each person or organization has in the RTW process. In addition, stakeholder efforts to improve or realize RTW outcomes are impacted by: power-based relations, the emergent culture, a region or sector (e.g., public vs. private, financial sector vs. manufacturing, or construction or service) (Brunarski et al. 2008), working with mental health versus occupational injuries, and workplace types (e.g., small business, national, multinational) (Shaw and Feuerstein 2004). The hierarchal nature of relationships may lead to one stakeholder to dominate the process, control information, and constrain the interactions of others. Further consideration must be given to policies that construct and shape expectations for interactions; nationally or regionally, policies should have more prescribed requirements for interactions involving different agencies that provide resources when work loss or disruption occurs. One requirement, in situations where a worker needs to claim for income benefit support for a work-related leave, clarifying forms needed and identifying stakeholders who complete and submit them (normally physicians or health care workers).

Coordination of stakeholders representing differing priorities and their roles in RTW is also complex. Thus, within a given context, such as a community of practice of multiple stakeholders (for example, a work sector, workplace or region), Brunarski et al. (2008) argued the utility of a matrix template identifying team roles and responsibilities. In his chapter, the roles and responsibilities in the RTW process are situated with a regional context in Ontario, Canada, and were developed through a collaborative and consensus process. A template for employer roles and responsibilities was prepared; see Table 18.1. Here, a round-table of participants determined employer defined roles and responsibilities in RTW processes in line with duty to accommodate legislation and employers' responsibilities as outlined by the Workplace Safety and Insurance Board of Ontario. Following the employer, the roles of other stakeholders were defined to support the enactment of workplace based RTW practice. This approach constitutes a starting point for developing a plan and an algorithm for integrating multiple RTW stakeholders in a community of practice that may operate virtually or in an area with no clinic or workplace based team.

Table 18.1 Template for employer roles and responsibilities

Starting point	Defining Employer's responsibility: Duty to accommodate Safe Working conditions: productivity, profitability, and diversity	Stakeholder #2 inserts information on how they work to support RTW and the six steps
Step 1	Employer ensures workplace culture is supportive and ensures flexibility of work organization to accommodate the different needs of workers	
Step 2	Employer gives employee RTW policy/program; employee takes to physician	
Step 3	Employer receives workplace medical precautions from employee	
Step 4	Employer offers employee modified work options for RTW. Institutes safety and ergonomic programs for preventing new injury/reinjury. May offer in-house medical services	
Step 5	Employer initiates timely return to work plan which incorporates input from physician (and other health professionals)	
Step 6	Workplace parties address further relationship issues via dispute resolution process	

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Within the workplace management and labor strategies, helping workers transition back to work post occupational injury involves addressing workplace-specific issues where collective agreements, worker's compensation polices, and human rights acts all enter into decisions and processes. Jodoin and Harder (2004) outlined specific strategies available for unions and management to move beyond conflict and distrust to enact cooperation in support of return to work. Some of the key strategies were formalizing committees in disability prevention and involving workers and management to gain buy-in through transparent processes and communications.

Similarly, Pransky et al. (2004) underscored the importance of the social interaction, namely, more communication-based interventions focused on developing relationships and consistency of information among parties needed to optimize RTW outcomes. Despite stakeholders positively interacting across multisystems to achieve successful RTW outcomes, the process remains challenging. The contextual and socially situated nature of RTW processes, practices, and stakeholder priorities makes prescribing a set of specific actions, interactions, and transactions for each community of practice difficult. Literature calls for shared goals and seamless cooperation using collaboration and participatory approaches (Brunarski et al. 2008; Jodoin and Harder 2004; Leyshon and Shaw 2012; Reynolds et al. 2006; Schultz et al. 2007; Shaw et al. 2012).

This chapter aims to facilitate exploration of interactions and processes when working with a group of stakeholders to achieve positive and successful outcomes. Five *Actions for Reflection* are posited to enact a collaborative, occupationally *just* process of RTW among stakeholders:

1. Reflect on the situated nature of RTW.
2. Reflect on your organizational priorities in the context of RTW collaborative practice.
3. Critically reflect on current best practices in stakeholder involvement in RTW processes and the need for targeted stakeholder participation.
4. Identify ways to enact shared and occupationally just goals for RTW with other stakeholders. Begin to work towards change in processes and practices.
5. Evaluate and reflect on effective processes and strategies to achieve RTW success. Enhance practice.

18.2.1 Action 1. Reflect on the Situated Nature of Return to Work

As work occurs in a transformative and increasingly global world, reflecting on the situational nature of RTW is critical. Workers, employers, and insurers involved in return to work practices where workers experience work disruptions can no longer be assumed to be from within one country or context. Employers and insurers may be located in one country whereas work may be conducted transnationally. Even within more local or regional contexts, health, social and insurance services are also in a constant state of change or evolution; revisiting and reinterpreting the knowledge that informs RTW practices is essential in light of societal policies and laws. Thus, stakeholders must first understand the question: "*What is the situated nature of RTW in the context in which you engage in the RTW process*?"

Stakeholders involved in RTW belong or are aligned with a system or organization. Within these organizations, there are policies or procedures or regulations that govern, create or establish a set of rules that stakeholders must either abide by or seek to enact. Important documents are:

1. Union contracts.
2. Standards of health regulatory boards.
3. Health association position statements, such as the Canadian Association of Occupational Therapists position statement on return to work (http://www.caot.ca/default.asp?pageid=3883), the Ontario Medical Association Position paper on the Role of the Primary Care Physician in Timely Return to Work (https://www.oma.org/Resources/Documents/2009PCPandTimelyReturn.pdf), and the Canadian Medical Association position statements (http://www.worksafebc.com/health_care_providers/Assets/PDF/PhysiciansRoleHelpingPatientsRTW.pdf).
4. Workplace procedure documents or health insurance policies.
5. Workplace compensation policies and procedures for work accommodation and return to

work, and/or human rights documents on workplace accommodation.
6. Guidelines for worker responsibilities in social service policies or labor market services for persons with disabilities.

Such texts often represent the standpoint of the stakeholder and/or the prescribed roles and responsibilities of the players throughout the RTW trajectory from work disruption to work resumption. Some of the documents specify the types of information sharing, or engagement or boundaries in the treatment, rehabilitation or workplace based RTW processes and subsequent interventions.

Underscoring RTW interventions and processes, a hierarchy of rules and policies at the macro level within society exist; these must be understood in consideration with stakeholder priorities. For instance, some of the policies within countries govern how access to services and income supports are resourced, which is relevant to work disruptions. These policies are not consistent among countries; some are accessed through social services and others through specific labor-market services. In addition, some health or disability policies may be national, directing universal unemployment income supports whereas other countries have specific mandates for regional workplace-specific insurance or private insurance.

The expectations and actions of each stakeholder and/or the respective organization are further socially constructed through charters of human rights and accommodations and may also be based on national health, safety and disability policies and legislation. Moreover, understanding overarching texts (e.g., charters on human rights) and the ruling relations (e.g., laws, policies) that underscore RTW resources for workers, such as accesses to services, rehabilitation, and benefits is important. Notably, the rights to work, health care, and accommodation are all potential human rights that may be imperatives for stakeholders to understand and if the stakeholder policies or practices relevant return to work issues are in contrast (or consistent) with these fundamental rights.

To reflect on the situated nature of RTW, a stakeholder in RTW is best advised to ask the following questions:

- *What are the rights of workers experiencing a work disruption due to work injury or illness in the context in which the work was conducted and for the country of origin of the employer?*
- *What are the rights of workplaces? Are they the same or different?*
- *What are the acts and current laws governing access to services and resources such as equipment accommodations or accessibility?*
- *What are the current acts or laws governing health services, work rehabilitation, and income replacement while on work absence?*
- *What is the hierarchy of rules governing return to work processes inside and outside the workplace?*
- *Who has decision-making authority based in a given RTW context and how are decisions made?*

The next step is to understand how a stakeholder's organizational priorities fit within the current context practice of return to work.

18.2.2 Action 2. Reflect on Your Organizational Priorities in the Context of Return to Work Collaborative Practice

Each stakeholder has priorities for their role in RTW; these must be considered in light of best practices, especially collaboration. Identifying stakeholder priorities and the potential for engaging in a collaborative process is key to success in multisystem interactions. The research literature on RTW processes has consistently advocated for cooperation (Jodoin and Harder 2004) and collaboration as primary means to achieve successful return to work outcomes (Brunarski et al. 2008; Franche et al. 2005). In reality, the lens of RTW processes and outcomes expected by stakeholders is most often viewed from the priorities of their organization; thus, reflecting on organizational priorities that use a collaborative approach when working with multiple stakeholders is important. Self-examining interactions with others is a need that arises from problems experienced due to a lack of teamwork, trust, or cooperation among stakeholders (Dyck 2002; Jodoin and Harder 2004).

Literature reveals that a lack of collaboration in RTW practices can lead to tensions among stakeholders when they have differing priorities (Korzycki et al. 2008; Reynolds et al. 2006). Often, the differences in stakeholder priorities, in particular on information received and tasks, may be at odds with worker or worker representative priorities; this discrepancy can lead to tensions in RTW processes (Shaw et al. 2009a, b). Differences in stakeholder priorities become apparent to workers with communication discrepancies or unfamiliarity with the roles of other stakeholders. Workers often feel removed from the process—in particular not receiving coordinated or pertinent information from employers, health care providers, and insurers to make informed decisions and, when information is received, having disagreeing or conflicting information (Korzycki et al. 2008). This lack of coordination and consideration of the worker's need for transparent communication leads to skepticism creep and the discrediting of knowledge that is shared and exchanged (Shaw et al. 2009b). Manifestation of further occupational injustice in processes that are meant to support and engage workers can occur.

Stakeholders are beginning to clarify their interactions with others in RTW by including statements about group effort, partnerships or teamwork in position statements and to acknowledging them as part of best practice in RTW planning or implementation of interventions. Some health care regulatory associations are also making statements about the need for interprofessional interactions in client care, which further mandates teamwork within and across institutional environments (Shaw, L. et al. 2008). Clarifying documents, such as position statements, is one way of reshaping multistakeholder interactions to achieve shared goals for enabling work resumption for workers.

As a stakeholder in RTW, these reflective questions are offered to prompt conscious awareness of stakeholder interactions and change toward more coordinated processes in working with others. RTW stakeholders, such as clinicians or persons in positions of power in the RTW process, are advised to ask:

- *What are the organization's priorities for RTW outcomes?*
- *How can these be enacted within a non-hierarchical and consensus based approach with other stakeholders?*
- *What is the organizational viewpoint or statement on cooperation and collaboration or teamwork in RTW?*
- *How can current role(s) in RTW processes be aligned with collaborative or cross sector practices to ensure excellent and effective communications across all stakeholders?*
- *How can collaborative processes be communicated with other stakeholders? How to become more fluid and transparent in communications?*
- *How does the organization ensure that workers receive timely and coordinated information to support them in making informed decisions in recovery and in returning to work?*
- *How does the organization include or support worker participation in and across the RTW steps and processes?*

18.2.3 Action 3. Critically Reflect on Current Best Practices in Stakeholder Involvement in Return to Work Processes and the Need for Targeted Stakeholder Participation

Current research supports the need for collaboration among stakeholders involved in RTW processes (Franche et al. 2005; Ouellette et al. 2007). A variety of approaches exist to guide interactions of stakeholders in RTW processes; however, little research on what approaches are effective has been conducted (Franche et al. 2005). The preferred nature of interactions among stakeholders suggests that trust, respect, and communication are key dimensions (Baril et al. 2003; Dyck 2002). Research shows that when workers are actively involved as a partner or considered a team member in rehabilitation and return to work planning, they are more satisfied with work outcomes (Shaw et al. 2004, 2007). Their views help to advance current thought on the types of RTW outcomes that ought to be measured.

For instance, Leyshon and Shaw (2012) found that worker-centered outcomes (worker performance, worker job satisfaction and worker well-being) and process outcomes (human rights, seamless RTW processes through collaborative communications and satisfaction of stakeholders) were relevant and important to all stakeholders in return to work practice. Similarly, Hees et al. (2012) found some of the same issues in determining RTW outcomes for persons with mental health conditions (sustainability at work, work functioning, work–home balance, mental functioning at work, and job satisfaction). However, stakeholders frequently have different viewpoints on the relative importance of such outcomes. These findings suggest the RTW process and ensuing relationships needs to include a more value oriented person-centered and participatory approach. Suggestions and examples of how stakeholders and multisystems interact and what actual teamwork processes might be used are found in the literature. Importantly, knowledge arising from business models might be explored (Franche et al. 2005).

Brunarski et al. (2008) suggested that different team approaches can be used in return to work processes: multidisciplinary, interdisciplinary, or transdisciplinary. Each of these approaches to teamwork or group efforts is different with respect to how teams manage decisions. Decisions can be achieved through hierarchal processes and are independent of each other (multidisciplinary), consensus and are non-hierarchical (interdisciplinary), or fluid, interdependent and also non-hierarchical (transdisciplinary). Consider having stakeholder groups define what their shared understanding of RTW outcomes is and which teamwork approaches for decision making are appropriate.

Tailoring involvement of stakeholders to make it more seamless (less confusing and more simplistic) is recommended. To achieve this goal, stakeholders or communities should consider (1) the complexity of the work loss for the worker (duration and extent of impairment(s), disability, impact on future employability of worker, and the impact on family) and (2) the heterogeneity of stakeholders' paradigms and priorities. Notably, for RTW situations for workers with anticipated specific recovery times and well-established accommodation processes, the stakeholder engagement in RTW can be tailored and simplified to those with an involved planning role in RTW such as the worker, employer, and/or health provider. All other stakeholders remain in communication but within a more consultative role.

However, for more complex health and social problems (the more complex a work loss is for a worker and the family, the more recovery duration is undefined), cross-discipline knowledge may be required to find innovative ways to address or resolve problems when traditional best practices in accommodations are not applicable. In complex situations, the need for more active involvement rather than a consultative approach may be warranted from other stakeholders and should be targeted and also enacted earlier in the process. When stakeholders establish and commit to a common approach of worker-centered goals and transcend organizational boundaries that create tensions in RTW planning or processes, this supports resolving complex health and social problems.

Importantly, sharing goals and fluidity within a community of practice of stakeholders is consistent with transdisciplinary strategies in teamwork (Brunarski et al. 2008; Shaw et al. 2008). The need for interdisciplinary knowledge in complex situations is also a cornerstone of transdisciplinarity (Nicolescu 2002). For instance, shared goals for RTW for a worker may be work particiption in a new job and worker well-being. The stakeholders within the RTW community of practice would then identify and agree on the mechanisms to support the goals, openly communicate with all parties, involve the worker in decision making, and commit to sharing best practices toward the resolution of potential work disparities or prevention disability at work and at home. In addition, with high heterogeneity and potential for tensions or differences in priorities among different stakeholders, appreciative inquiry approaches are suggested to move beyond challenges and avoid needless conflicts (Bushe 2007).

Notably, stakeholders may all contribute their knowledge by drawing on *what has worked very well* in the past in complex situations and examining opportunities with respect to *what might be used to* enable planning and innovations in the context of work resumption or work transitions for the worker whose situation is complex. Appreciative inquiry focuses on what can be done based on collective knowledge, experience, and evidence rather than focusing on the problems or blaming them on lack of resources.

In situations where stakeholder priorities are more homogenous, other approaches may be more suited, such as the use of interdisciplinary decision making strategies where the focus is on consensus to guide interactions. What is *key* to all of these approaches is the active participation of the right people in the actual RTW planning and implementation, including the worker and employer, while preserving respect and dignity of the person experiencing work disruption.

Critical reflection on current practices is essential to question and assess assumptions about the state of interactions among stakeholders involved in RTW. This type of reflection increases insights into the use of new approaches that may be needed to change or revise current ways of working with others to achieve those RTW outcomes, which are believed to be important to stakeholders. Based on the need to understand these assumptions and change practices, clinicians and stakeholders are best advised not only to ask how the group interacts but also how they contribute to the interactions:

- *What is the current nature of stakeholder interaction*?
- *How do stakeholders demonstrate respect or understand or appreciate the different viewpoints of other stakeholders*?
- *How do team members ensure that the worker is included as a valued stakeholder*?
- *What do team members need to do to be more collaborative and engage in a team approach in RTW interactions*?
- *What types of teamwork approaches might be appropriate for current unsolved complex RTW issues*?
- *How can team members contribute to making the RTW processes more seamless, information transparent, and processes more simplified*?
- *In what ways do team members support worker rights to return to work, worker well-being, and optimal worker performance*?
- *How does the team stay mindful of innovations in RTW and the mechanisms of positive and effective stakeholder interactions*?

18.2.4 Action 4. Identify Ways to Enact Shared and Occupationally Just Goals for Return to Work with Other Stakeholders. Begin to Work Towards Change in Processes and Practices and Action 5. Evaluate and Reflect on Effective Processes and Strategies to Achieve Return to Work Success

Strategies that align with Actions 4 and 5 will emerge through self-reflection on individual and group interactions based on Actions 1–3. There is no set prescription for how each group of stakeholders might identify steps they might take to enact best practices that are occupationally just in restoring worker performance and well-being but that are also underpinned by collaboration, values of respect, trust, dignity, and participation. In the past, the literature has suggested that roundtables or workshops could be used to help stakeholders understand the potential of roles and establish responsibilities in RTW (Franche et al. 2005).

Presently, we are moving beyond the stage of defining roles and getting to know one another in the RTW process. At this time, we need to be identifying the *how*, the *strategies*, and the knowledge about *when* these strategies work to support more efficient and effective collaborative teamwork in solving RTW issues. Developing shared outcomes for RTW by stakeholders is one approach that is needed (Leyshon and Shaw 2012). Identifying collaborative processes that can be used to achieve shared RTW outcomes is likely to lead to improved practices. Another way forward is in keeping with Franche et al. (2005) and Shaw and colleagues (2012) who called for targeted stakeholder involvement in research. Engagement of stakeholders in knowledge dissemination practices as well as participation in research to document and evaluate how collaboration is enacted among stakeholders in different contexts is warranted. Knowledge of what works and in what context can help advance occupationally just policies and procedures for return to work. Each stakeholder can use these actions to reflect and evaluate practices to contribute to a more stakeholder informed set of best practices in RTW.

18.3 Conclusion

Moving forward across health practice, insurance and work sectors toward improved collaboration in RTW requires concerted effort and attention by all stakeholders. The literature offers many strategies that can be used within different contexts to improve return to work outcomes. Working together and focusing on shared goals for RTW can transpire through adopting “learning by doing” and using appreciative inquiry approaches to improve or revisit best practices in collaboration among stakeholders. Implications for groups of stakeholders include enhancement of communities of practice in RTW based on inter-sectoral and inter-professional participation to support RTW outcomes that are meaningful to stakeholders and facilitate disability prevention for persons who experience work loss. Use of collaboration, dialogue, and engagement of stakeholders is imperative in identifying and committing to shared goals and targeted solutions. Collaboration and participation will help communities of practice transcend differences and navigate more successfully the complexity of multisystem interactions in situated RTW.

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Work Organization and Return to Work

19

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19.1 Introduction

The negative impacts that time off work for injury or illness can have on the individual worker, his or her family, the workplace, and society can be dire and costly. The toll inflicted on the worker's self-esteem, family well-being, workplace productivity, and public health costs can be quite substantial. In response to this, the concept of return to work (RTW) has been developed as a way to improve the reintegration of injured workers into the workforce. Many studies have been published on the subject, elucidating factors that impact RTW (e.g., Baril et al. 2000; Baril et al. 2003a, b) as well as evaluating implemented RTW programs (e.g., Maiwald et al. 2011; Yassi et al. 1995). These studies confirm that successful RTW is a complex phenomenon involving many players in the worker's social and caregiving environment and particularly in the workplace itself. The factors determining successful RTW – and, more importantly, how these factors can be addressed – are continuing to be clarified. This chapter will present the current state of knowledge concerning the organizational determinants of successful RTW, using the framework of the macro-, meso-, and micro-organizational factors as a way to comprehend the factors that need to be considered in promoting successful RTW.

Modern RTW policies are the products of the historical, economic, and political context within which they were formed – the macrosystem. Accordingly, the chapter will start with a description of macrosystem themes, providing a depiction of the historical key events and the political contexts that are relevant to RTW. The second part of this chapter will reflect the mesosystems – consisting of the workplace, insurance, and healthcare system relationships – to explain how the interactions between stakeholders within and external to the workplace impact RTW. The third part will focus on the role of the microsystem – the coworker and supervisor support for the individual worker. This chapter will conclude by discussing the interplay between societal, workplace, and work unit factors – organizational structures that are crucial to understand and to facilitate a successful RTW (Table 19.1).

19.2 Macro systems

The macrosystems include the wider economic and political societal context within which return to work (RTW) policies take place. The

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Table 19.1 Macro, meso, and micro factors

	Factor	Author/article	Potential mitigating measures
Macro	Contextual factors such as legislation or jurisdiction	Hick (2007)	Promote political policies and legislation that are sensitive to the rights and needs of workers
Meso	Financial health of workplace/sector	Baril et al. (2000); MacEachen et al. (2006)	Invest in employees as much a possible; focus on creating a culture of safety which will aid in keeping workers safe at work; involving sectoral associations; seeking external resources
	Size of workplace	Baril et al. (2000)	Focus more on prevention efforts (i.e., help keep workers safe, not injured); involving sectoral associations; seeking external resources
	Workplace policies	Friesen et al. (2001), MacEachen et al. (2006)	Giving workers access to case managers (or similar) to answer questions or concerns they may have about the RTW process; allowing workers to be involved in deciding facets of their RTW (e.g., days/hours to work)
	Workplace culture	Baril et al. (2000), Friesen et al. (2001)	A positive workplace culture should already be in place before the injury, but if not, steps can be taken to build team, camaraderie, meaningful work for employees, to ensure workers feel valued
	Unions	Baril et al. (2000), Friesen et al. (2001), MacEachen et al. (2006, 2012)	Studies emphasize the crucial importance of union cooperation, support, and involvement in the RTW process
	Interaction with healthcare providers	Franche et al. (2005), Young et al. (2005)	Work disability duration is significantly reduced by work accommodation offers and contact between healthcare provider(s) and workplace
	Workplace support	Friesen et al. (2001), MacEachen et al. (2006), Maiwald et al. (2011)	Having appropriate tasks and duties available for workers returning after an injury/illness; RTW coordinators to help navigate the system

(continued)

Table 19.1 (continued)

	Factor	Author/article	Potential mitigating measures
Micro	Supervisor support	Labriola et al. (2006), Krause et al. (2001a)	Early communication with the employee to facilitate RTW (if/when appropriate); RTW coordinator to act as a buffer between supervisor and employee where appropriate
	Goodwill/respect between workers and managers	MacEachen et al. (2006)	Team work instead of hierarchy; ensuring worker knows he/she is a valued member of the workplace
	Coworker support	Baril et al. (2000)	Educating coworkers about RTW, and support from coworkers are crucial in ensuring successful RTW

evolution of social policies are briefly discussed below, followed by a brief discussion of the current economic and political situation relevant to implementing effective RTW policies and programs, with emphasis in the latter period on the political context of Canada and the USA.

19.2.1 The Evolution of "Return to Work" Policies

19.2.1.1 Preindustrial Period (Pre-1867)

Individuals in need of income came to cities to work in expanding factories, under terms and conditions of employment defined by the employer; factory employees worked unregulated hours often on dangerous machinery with no safety standards. Consequently, injuries were common, yet injured workers did not benefit from protective legislations. Indeed, pre- and early-industrialization workers were constrained under the "Unholy Trinity," a system of legal defenses benefiting the employer and minimizing any legal and financial protection should an injury occur. The Unholy Trinity defenses developed gradually early in the nineteenth century from English common law (Hick 2007) and were firmly held across Europe and North America. By agreeing to work for a particular employer, the worker automatically assumed any risks the position carried, a defense known as the "voluntary assumption of risk." The "Fellow-Servant Rule" relieved the employer of any responsibility if an injury sustained by an employee was caused by another employee's action, pitting worker against worker (Hick 2007). If the injury was caused by the worker him-/herself, the employer was not held liable under the "doctrine of contributory negligence." The severity of the "Unholy Trinity," coupled with the low wages workers earned, made a successful lawsuit against an employer unlikely to succeed; injured and disabled workers could be left with no employment and no income, resulting in detrimental impacts on them and their families.

19.2.1.2 Industrialization (1868–1940)

As a democratic society was taking hold in the Western world and non-propertied citizens gained suffrage, political parties reached for votes from the working class and so governments enacted legislations to improve the likelihood of success when workers sued their employers in court (Hick 2007). Workers' compensation policies were established in Europe during the mid-to late nineteenth century. Such policies came about more slowly both in Canada and the United States of America (USA) (Guyton 1999), and it was in 1908 that the Federal Employers Liability Act finally came into effect in the USA to protect and compensate injured railroad workers (Business Insider 2011; Schatman 2012). The Federal Compensation Act was established in 1916 to provide benefits to injured workers (DOL 2013), and state workers' compensations laws were implemented first in Wisconsin in 1911 (Guyton 1999) and lastly in the Yukon in 1958 (Hick 2007).

In Canada, the 1943 Royal Commission report, sparked by a post-World War II longing for security and headed by William Meredith, eradicated the Unholy Trinity defenses to replace them with what became known as the Meredith principle. Under the Meredith principle, a worker surrendered his/her right to sue an employer in exchange for guaranteed compensation if injury occurs, regardless of fault. The Meredith principle laid the foundation for the first Canadian Workman's Compensation Act in Ontario in 1915. All provinces subsequently implemented workmen's compensation legislations, with Newfoundland being the last province to do so in 1950; the Meredith principle still underlies workers' compensation programs in English Canada (Lippel and Lötters 2013).

Unions greatly influenced the development of workers' compensation programs. Accordingly, these programs grew in close parallel with the trade union movement (Baril et al. 2003b). Workers, eager to improve their working conditions, began to organize themselves into groups determined to defend workers' rights to fare wages and safe working conditions (Hick 2007). One of the first US unions, the National Labor Movement, founded in 1866, worked to unify local unions under a national umbrella (Business Insider 2011) and to standardize workers' rights across the country. The National Labor Movement was defunct 7 years later. The Knights of Labor Union took over in the mid-1880s and was subsequently replaced with the American Federation of Labor in 1886 through 1924 (Business Insider 2011).

In Canada, the 1886 Trade and Labour Congress was formed to give way to the Canadian Federation of Labour in 1902. These early unions' efforts pressured the political parties active in the end of the nineteen century to pass the legislation dismantling the Unholy Trinity defenses, hence enhancing the chance of success an injured worker had of successfully suing his/her employer (Hick 2007). The Trade Union movement supported the first workers' compensation laws (Baril et al. 2003b). Unions can greatly influence successful RTW (Baril et al. 2000; Friesen et al. 2001; MacEachen et al. 2006) as discussed later.

19.2.1.3 Great Depression (1929–mid-1930s)

After the 1929 stock market crash, most economies collapsed and the poverty level rose dramatically across the world. Working conditions and employment security deteriorated, triggering a rise in social unrest; workers rose to demand stronger government involvement in developing working standards, including stronger protection for injured workers. In Canada, the "On to Ottawa Trek," the Regina riots, the United Textile Workers' strike, among other displays of workers' dissatisfaction, motivated the government to become more involved with implementation of social policies for its workers and implement national standards. Many progressive reforms were implemented during the Depression amid this empowerment of the labor movement and legal recognition of collective bargaining rights. In the USA, the 1935 Social Security Act, the maximum hour law, a federal minimum wage, and the 1935 US National Labor Relation Act (DOL 2013) contributed to strengthening workers' rights.

19.2.1.4 World War II (1939–1945) and Welfare State (1941–1974)

Production sharply increased during World War II, as did occupational injuries. In the USA, industrial accidents continued to rise after the end of the war, and in 1968–1969, two million were injured on the job, and another 14,000 died from workplace hazards. In response, US

President Richard Nixon enacted the Occupational Safety and Health Act (OSHA) in 1970 (Business Insider 2011), aiming to "assure safe and healthful workplaces by setting and enforcing standards and by providing training, outreach, education and assistance" (OSHA 2013).

In Canada, the post-Depression period was characterized by a greater involvement of the government in public life, in accordance with the Keynesian economic philosophy that dominated in the Western world. The 1943 Report on Social Security in Canada, headed by Dr. Leonard Marsh, emphasized the importance of social insurance and income security benefits, including social insurance covering employment risks (Hick 2007). For workers, this meant a strengthening of their rights to proper compensation if occupational injuries were to occur. This welfare era witnessed a rise in union memberships (Hick 2007), accompanied by a corresponding strengthening of workers' rights.

19.2.1.5 1975–2013

In 1975, factors such as a sharp increase in the price of oil and the consequent decline in global economies led the Canadian and American governments to cut back on public sector spending, and Keynesian economic ideas gave way to a neoliberal way of managing the economy wherein less funds were allocated to social policies and to support employment for workers (Hick 2007). In the USA, President Reagan set a new, detrimental precedent for workers' rights when he fired 12,000 air traffic controllers for striking. This new movement made it easier for private employers to undermine unions and limited public sector unions' power. Union memberships in the USA declined sharply thereafter (Hirsh 2004).

In line with neoliberal theory's belief that unemployment is advantageous, unemployment growth created additional pressures for workers who suffered occupational injuries. In these circumstances, when a worker suffered an injury at work, it was easier for an employer to replace him or her rather than wait for the worker to recover because a steady percentage of the population remained unemployed. RTW policies were accordingly not well developed in the late 1970s and early 1980s, and workers injured on the job had little chance of having their position maintained upon recovery.

This period was also distinguished by a globalizing economy, as free trade agreements were developed to facilitate trade between countries that could promote a shift of production from higher to lower labor cost sites. These agreements acted to give corporations more power, hence eroding the ability of governments to establish or maintain social programs aimed at protecting workers (Rice and Prince 2000). For example, a program could be considered a trade barrier and mandated to be eliminated (Hick 2007). The removal of the barriers to trade between countries also meant that corporations could easily move their business from a place where standards for workers' rights are stronger to export processing zones in lower-income countries where working conditions are poor, injuries levels high, and RTW policies absent (Heymann et al. 2013). In Canada and the USA, as globalization allowed jobs to be moved or outsourced, a gap in job supply ensued, leading to growing inequality in wages and benefits within these higher-income countries (Mishra 1999). Globalization, along with factors such as advances in new technologies and organizational restructuring, made "de-jobbing" (a decrease in standard high-paying unionized jobs and an increase in nonstandard part-time jobs) a trend for workers in higher-income countries (Bridges 1995). Employers became more hesitant to hire full time, full-year employees and preferred contract or part-time hiring (Hick 2007). Consequently, workplaces are less willing to offer RTW programs for a nonpermanent employee.

However, for workplaces willing to offer RTW access and policies, the current era has seen substantial developments in RTW programs. In the mid-1980s, a body of research focusing on rehabilitation programs for injured employees emerged (see Mayer et al. 1985; Wiesel et al. 1984). In the 1990s, researchers in Quebec, Ontario, and Manitoba were particularly fruitful in establishing knowledge and developing programs for productive and evidence-based RTW interventions, both for the injured worker and the workplace. The *Sherbrooke Model* (Loisel et al. 1994, 2003), the *Prévention des situations de handicap au travail* programs, the *Quebec Network in Work Rehabilitation* (Loisel et al. 2003), and the Ontario, Quebec, and Manitoba *WorkReady* (Baril et al. 2003b; Friesen et al. 2001) are pioneer evidence-based RTW programs developed during the 1990s and 2000s (Loisel et al. 2003; Baril et al. 2003b). The Institute for Work and Health in Ontario also advanced work in this area (IWH 2013). Research emerged from Manitoba highlighting some important insights (Friesen et al. 2001). These programs were appraised, and as evidence continued to build and be assessed, the knowledge on the factors important in successful RTW continued to evolve and be refined. The mesosystem level analysis in section 2.0 of this chapter synthesizes what is now known to define successful RTW.

19.2.2 Differences Across Jurisdictions

19.2.2.1 Europe vs. North America

Current North American and European Union (EU) workers' compensation programs have evolved from the Prussian foundation in different directions. American compensation programs are cause based, and the right to compensation rests on proof that the injury is work related. In Europe, a worker is compensated whether the injury or disease is work related or not, although compensation for work-related injuries is higher (Lippel and Lötters 2013). In the USA, state compensation programs pay for less than 33% of the costs related to occupational injuries. Less than 50% of American workers benefit from short-term disability insurance. In the EU, 100% of workers are protected (LaDou 2011). See Table 19.2 for a comparison on North America and Europe with regard to workers' compensations rules.

Table 19.2 Workers' compensation systems in Europe and North America

	North America	Europe
Characteristics	• No-fault systems • Caused-based systems: must prove that the injury was work-related for compensation	• Workers can sue employer • Compensated whether injury occurred at work or elsewhere
% of workers covered by short-term disability insurance	• Less than half	• All workers
Types of medical condition compensated	• Mostly musculoskeletal • Mental health sometime compensated • Occupational diseases rarely compensated	• Musculoskeletal • Occupational diseases
Financed by	• Employer	• Employer • Publicly funded
Benefits	• Based on pre-injury earnings • Cover 75–90 % of earning in Canada • Maximum insurable earning cap	• Based on pre-injury earning • Cover 60–100 % of earnings depending on country
RTW incentives	• Target worker by compensating less than pre-injury earnings (incentive to work) • Employer obligated to save the worker's job	• Target worker by compensating less than pre-injury earnings • Target employer, who must keep paying employee on sick leave • Employer obligated to save the worker's job or find another suitable job

Reforms in the EU have increased the employer's responsibility to provide a safe workplace through legislatures, and incentives are given to recruit disabled workers (LaDou 2011). In some countries, it is the legal responsibility of the employer to provide their injured workers with a modified position within the same company or to assist them in finding employment with a different employer (LaDou 2011). Employees who suffered a disabling occupational illness or injury are thus able to return to an acceptable job and, likely, to maintain a sense of empowerment and self-esteem resulting from meaningful employment (LaDou 2011). Legislation in some Canadian jurisdictions requires the employer to provide modified work for a returning employee (Friesen et al. 2001; Lippel and Lötters 2013).

19.2.2.2 Canada vs. USA

In Canada and the USA, workers' compensation programs are exclusively financed by the workplace (Lippel 2007; Lippel and Lötters 2013) and still rest on the Meredith principle and the "no-fault" system, where the worker receives compensation for injury regardless of fault. In return, the worker gives up the right to sue his/her employer. In Canada, a jurisdictional public system, for example, WorkSafeBC or the Workplace Safety and Insurance Board in Ontario, collects premiums from employers and redistribute them to the worker. In the USA, private insurers cover the workplace in most states, although in some jurisdictions public compensation boards are responsible for claim assessment and premium collection. There are thus 63 different jurisdictions across North America, each with their own characteristics regarding workers' compensations and RTW (Lippel and Lötters 2013).

19.3 Meso systems

The mesosystems with respect to workplace organization issues represent the interactions of the worker with structures and stakeholders within the workplace. These relate both to the economic context of the workplace as well as the organizational context, as discussed below.

19.3.1 Economic Context

19.3.1.1 Sector (Seasonal, Temporary vs. Year Long, Private vs. Public)

The presence/absence of RTW procedures is strongly associated with the economic sector in which the enterprise operates. Baril and colleagues (Baril et al. 2003a) have documented a complex interaction between RTW measures and the sociodemographics of workers, characteristics of the injuries, and the structural characteristics of the company. The data show that workers in the rubber and plastic sector were more likely to be offered RTW measures, while workers in the transportation and warehousing sectors were less likely to have such measures available to them. The authors explained that the sector of the enterprise influenced RTW policies indirectly, and the underlying characteristics of the work in each sector, such as nature of the work, work organization, and employment status, helped influencing the use/nonuse of RTW policies (Baril et al. 2000). The authors acknowledged that certain economic sectors were possibly underrepresented.

Most of the literature concerned with RTW evaluates programs set in conditions of permanent employment, with particular focus on public sectors such as healthcare (Yassi et al. 1995). Indeed, RTW systems support workers in such formal sectors, while those working in informal sectors, those self-employed, or those seasonal workers are left unsupported by the paucity of RTW programs (Lippel and Lötters 2013). Workers in seasonal and informal sectors tend to be less educated, and employers are less willing to adapt work for their lesser skilled employees (Baril et al. 2000). Likely, employers hiring seasonal workers will be less inclined to implement RTW programs or provide modified positions, as it may seem easier for these employers to replace such workers than to invest in his/her recovery. Additionally, the lack of policies to keep employers accountable in case of an occupational injury in informal sectors likely promotes precarious employment; employers are more inclined to hire temporary employees and thus avoid responsibilities associated with RTW (Lippel and Lötters 2013). More research assessing the state of RTW procedures in seasonal and temporary industries is warranted to improve the outcomes of injured employees working in informal industries.

19.3.1.2 Financial Health of the Workplace

The financial health of a workplace, that is, whether the enterprise is growing or downsizing, influences the willingness of a workplace to channel efforts into returning an injured employee to work (Baril et al. 2000; MacEachen et al. 2006). Growing companies have the financial and personal resources necessary to implement robust RTW programs; RTW is expensive from the short-term perspective, and financially healthy workplaces have the ability to implement modified positions and to invest in the cost of an injured worker. Workplaces experiencing financial difficulties have less flexibility to accommodate an injured worker, as modified jobs are more difficult to create in a climate of layoffs and downsizing associated with economic hardship. Employers in downsizing companies are more likely to prioritize finances and productivity *in the short term* over the well-being of injured workers (Baril et al. 2000; Friesen et al. 2001; MacEachen et al. 2006).

19.3.1.3 Size of Workplace

The size of the enterprise is a significant predictor determining the presence or absence of RTW policies and programs (Baril et al. 2003a). Baril and colleagues (Baril et al. 2000) described factors enabling bigger enterprises to offer more robust RTW programs to their injured employees: such enterprises tend to have more personnel who can devote part of their time coordinating RTW; the RTW procedures are often formal and standardized across departments, easing the RTW process; collaboration with external resources (physician, insurer) is more likely in bigger enterprises; and, finally, more positions are available in bigger workplaces, facilitating modified work for the injured worker. Very small enterprises often do not have the ability to offer modified work due to the limited positions available, and do not possess health and safety infrastructures. Due to the logistical inability of small workplaces to offer modified work to their injured workers, the authors suggest that smaller enterprises focus more on prevention measures (Baril et al. 2000).

19.3.2 Organizational Context

19.3.2.1 Workplace Culture

A crucial determinant of worker attitude toward RTW is the concept of the worker's involvement in the RTW process. Workplaces which actively involve their injured workers by giving them a say in the scheduling, giving them choices or alternatives, letting them know the RTW plan is flexible, and encouraging them to participate, can heighten workers' motivation to cooperate. Workers who are active participants show attitudes favorable to successful RTW and increase the chances of successful RTW (Friesen et al. 2001).

The RTW system (i.e., all bureaucratic and organizational structures involved in returning the injured worker to work) can have complicated rules and regulations, and understanding this system can be extremely complicated for injured workers, who are expected to be self-reliant (MacEachen et al. 2006). Injured workers have described the system as being intimidating and as requiring a whole new skill set (Friesen et al. 2001). MacEachen and colleagues noted that injured workers can feel uncertainty about procedures and rules written in a jargon difficult to understand for the uninitiated (MacEachen et al. 2006). Consequently, misunderstandings between workers and workplace, insurance systems, and healthcare providers can be common unfortunate occurrences (MacEachen et al. 2006), and workers perception that decisions are arbitrary or unfair can lead to frustration and lack of motivation (Baril et al. 2003b). Friesen and colleagues (Friesen et al. 2001) suggested that having appropriate resource persons to answer questions and concerns can help enable workers to be their own case managers, thus empowering them to manage their way through a system, sometimes characterized as Kafkaesque (Guyton 1999). Additionally, research confirmed that the policies and practices need simplification to enable understanding (Friesen et al. 2001).

The culture a workplace cultivates was found in several studies to be an important predictor of RTW (Baril et al. 2000; Friesen et al. 2001). Workplaces that give high value to their employees by adopting a people-oriented work culture, by valorizing employees' competencies and their work, and by favoring maintenance of a good work climate positively impact RTW (Friesen et al. 2001). These types of employers are more willing to provide returning employees with flexible and meaningful adapted work (Baril et al. 2000); thus they are able to maintain worker empowerment.

A supportive work climate and a supportive team, demonstrated through strong teamwork and cooperation among management and labor, are key in ensuring the successful reintegration of an injured worker into the workplace (Baril et al. 2000; Friesen et al. 2001; Ouellette et al. 2007).

Conversely, workplaces which put less value on their employees, such as those employers who blame the employee for his/her injury or doubt their employees' integrity, can hinder successful RTW by creating an environment of suspicion and social hardening, discouraging both the injured worker and the employer to cooperate with RTW program guidelines (Baril et al. 2000; MacEachen et al. 2006).

MacEachen and colleagues (MacEachen et al. 2006) reported that if RTW is to be successful, workplaces needed to cultivate goodwill among workers and managers. According to the authors, goodwill influences a range of factors: (1) workplace ideas about how much to allocate to RTW and injury prevention programs, (2) the ability to negotiate the RTW process, and (3) the amount of effort put in creating modified work for the injured workers. Workplaces whose underlying culture reflects goodwill are significantly more successful in returning their injured employees to work, while workplaces which prioritize cost saving and production statistics over acting in the best interest of their injured workers are usually less successful in motivating the worker to return to work.

Organizations that are successful in RTW need agreement among all levels of management. In bigger enterprises, with different departments, rules concerning prevention of injuries and RTW are more successful when uniformed and standardized across the organization. Variance between departments can negatively impact workers' attitude toward RTW and can slow down the RTW process (Baril et al. 2000). When supervisors' priorities conflict, such as one valuing RTW programs while others see RTW as burdensome and impeding workplace productivity, the RTW programs are unlikely to be successful (MacEachen et al. 2006).

Authors who focus on factors impacting successful RTW programs highlight the importance of an organizational culture of safety, based on trust between employer and employees and of a supportive work climate (Badii et al. 2006; Franche et al. 2005; MacEachen et al. 2006; Maiwald et al. 2011). The presence of an injury prevention program within a workplace can be indicative of a workplace that takes a positive and active stance toward safety and health; workplaces that do this are usually more likely to be actively involved in RTW (Baril et al. 2000).

Successful RTW programs must be designed to link primary prevention (where guidelines are put in place to prevent injury from occurring) and secondary prevention (where guidelines support RTW after injury) (Davis et al. 2004; Maiwald et al. 2011; Yassi et al. 1995). Influential primary prevention interventions consist of an educational campaign to influence attitudes and beliefs (Buchbinder et al. 2001; Guzman et al. 2008) as well as workplace system adaptations to involve higher management and workers. Influential secondary prevention measures include simplified reporting, on-site attention, early work accommodations, and ergonomic and vocational rehabilitation interventions (Guzman et al. 2008).

The Prevention and Early Active Return to work Safely (PEARS) program in British Columbia's healthcare sector was developed as a response to the need for best practices in RTW and was designed to have strong primary and secondary prevention components (Maiwald et al. 2011). Following its implementation in the early 2000s in two large Canadian hospitals, PEARS was rigorously evaluated, and all articles concluded that an integrated program linking primary and secondary prevention was a determining factor in sustainable and effective RTW for all parties involved (Badii et al. 2006; Davis et al. 2004; Maiwald et al. 2011; Ouellette et al. 2007).

19.3.2.2 Presence of a Union

According to Baril et al. (2000), belonging to a union increases the probability of successful RTW. Unionized workers have a better ability to assert their point of view to the decision-makers. Union involvement in RTW procedures can also ensure a reduction in discriminatory measures. However, it is important that unions do not create rigid and obstructive rules which can create dissatisfaction for the injured worker and can add an unnecessary level of complexity to the RTW process; for example, when unions demand that a union representative be present for every communication between the worker and the employer, which can slow down communications (Friesen et al. 2001). Baril and colleagues (2000) observed that eight out of nine collective agreements contained clauses directing that seniority must be taken into account when temporarily reassigning returning workers to modified positions. If rules are too rigid, they can reduce the flexibility required when implementing the work modifications for an injured worker, for example, by “reserving” less physically demanding jobs for older workers (Baril et al. 2003b). The authors urge unions to become involved in the development of RTW policies and have such policies reflected in their collective agreement.

Poor communication between the union and the employer has been identified as a barrier to successful RTW. Studies emphasized the crucial importance of union cooperation, support, and involvement in the RTW process (Friesen et al. 2001; MacEachen et al. 2006; Maiwald et al. 2011). Unions and employers do not usually see each other as partners (Maiwald et al. 2011); however, the RTW process can present an opportunity for these two players to work together for the benefit of the injured worker. A work climate exuding cooperation and trust between union and employer can thus create a work climate favorable to the RTW process (Maiwald et al. 2011).

The involvement of the workplace is crucial in the RTW process (Badii et al. 2006), and the presence of workplace-initiated, workplace-based, and work-focused procedures to manage injury and RTW is predictive of the success of RTW (Friesen et al. 2001; Guzman et al. 2008; Loisel et al. 1997). Baril and colleagues (2000) observed that organizations that achieved successful RTW created systematic RTW procedures describing the steps to follow when injuries occur. Marketing the concept of RTW via training and education sessions tailored to the particular audience was found in this study to be an important step in establishing credibility of the RTW program among the stakeholders (Friesen et al. 2001). Workplaces that adopt formalized RTW procedures distribute them to all departments, educate stakeholders (with brochures, posters, and information sessions), and ensure a standardized RTW process among all levels of the organization (Baril et al. 2000).

19.3.2.3 Interaction Among the Workplace and Healthcare Providers

Franche and colleagues (Franche et al. 2005) undertook a systematic review of the effectiveness of workplace-based RTW interventions. They found strong evidence that work-disability duration is significantly reduced by work accommodation offers and contact between healthcare provider and the workplace. Young et al., in a review of the literature, found that RTW stakeholders can share the goal of a successful RTW (Young et al. 2005); this is especially true of healthcare providers. Another factor which may be an issue is for health providers, whose goal is diagnosis and treatment of the health problem, to be required to comment or provide an opinion about the work ability of an employee or, in some instances, to issue a medical declaration required by the payer for permanent work-disability compensation. This can be a difficult task as they may not be familiar with the nuances of the employee's work (Young et al. 2005). It is essential that all players (employees, employers, and health professionals) work together to have the optimum effect on a positive RTW (Frank et al. 1998; Reavley et al. 2012).

19.3.2.4 Workplace Supports

Injured workers often want to return to work as soon as possible, as long as modified work is available (Friesen et al. 2001). Indeed, early RTW can keep workers' spirits up by "preventing getting depressed being at home," by keeping workers as an integral part of their team, and by allowing them to maintain feeling valued for their skills (Baril et al. 2003b; Maiwald et al. 2011).

It is crucial that modified positions be tailored to the worker's capacity and that social aspects are taken into account. MacEachen and colleagues (MacEachen et al. 2006) gave the example of the injured truck driver whose modified position placed him in a female-dominated office where he did not feel he belonged and did not have the social skills to fit in. The authors suggest that by overlooking the social aspect of modified work, workplaces can negatively impact the success of RTW.

Modified positions that are flexible and tailored to the worker's capacity and needs maintain the workers' empowerment and sense of dignity (MacEachen et al. 2006), and positions that have productive value benefit the employer, who is paying a worker to do modified work rather than to stay at home (Friesen et al. 2001; MacEachen et al. 2006). Employers who monitor the modified work to ensure that it remains meaningful to the injured worker further increase the success of RTW (MacEachen et al. 2006). On the other hand, in cases when the modified position is seen as "useless" or poorly planned, the worker is unlikely to cooperate with RTW efforts (Baril et al. 2003b).

Baril and colleagues (Baril et al. 2000) observed that workplaces that have a standardized list of modified positions applicable to each specific injury submitted to the treating physician have been successful in the assignment of modified work. In Quebec, where this study was set, the workplace and compensation board are in fact bound by law to abide by the opinion of the treating physician with regard to the physical limitations and other medical decisions regarding the injured worker, including modified work approval (see Lippel 2007). Similar to MacEachen and colleagues (MacEachen et al. 2006), Baril and colleagues emphasize that flexibility is essential in implementing modified work (Baril et al. 2003b). Flexible work can include letting the injured worker choose between different position alternatives, offering him/her a shorter workday, or implementing a restructuring so that the worker has greater control over his/her tasks or has help from a coworker. Usefulness and productivity of the modified position are also defined as essential to ensure worker empowerment and workplace satisfaction (Baril et al. 2003b).

19.4 Micro systems

The microsystem within a workplace refers to the individuals who make up the injured worker's work unit within the organization. These are mainly the supervisor and coworkers who are part of the day-to-day work-life of someone returning to work.

Potentially negative impacts of implementing modified work must be taken into account with respect to perceptions of fairness that this can generate in the workplace, especially when the social relations of the injured worker and his/her colleagues are poor. In such circumstances, the injured worker may feel under the scrutiny of others and that he/she needs to justify the genuineness of his/her injury. Additionally, resentment may arise from coworkers being forced to perform extra work, if the injured worker is given lighter, easier tasks or if the modified performance of the worker is perceived to affect group productivity (Baril et al. 2003a). Poor social relations between the injured worker and his/her coworkers is closely associated with reinjury, as the worker can feel peer pressure to perform work for which he/she is not ready (MacEachen et al. 2006; Nordqvist et al. 2003), so this factor has preventive as well as adaptive implications. Educating coworkers about RTW, and support from coworkers, are thus crucial in ensuring successful RTW (Baril et al. 2000).

There is increasing consensus that "social supports" are of utmost importance in the RTW sphere (Campbell et al. 2013; Lysaght and Larmour-Trode 2008; Väänänen et al. 2003). Conditions such as early contact with the injured/sick worker, using an RTW coordinator to facilitate communication between the workplace and the employee in question, a climate of goodwill in the workplace, and labor-management cooperation, are all imperative in facilitating successful outcomes (Baril et al. 2003b; Friesen et al. 2001; Hepburn et al. 2010).

Workers' empowerment can be defined as the right to make decisions or decision-making authority, as opposed to be subservient to those in a hierarchically higher position. Empowered workers enjoy increased satisfaction, performance, and productivity, outcomes desirable for both the worker and the workplace (Leslie et al. 1998). Workers' empowerment is especially relevant in the context of RTW: workers returning to work after injury or illness can suffer from decreased self-esteem, diminished social status, disrupted personal lives, and the feeling that they do not fit in (MacEachen et al. 2006; Friesen et al. 2001). Maintaining injured workers' sense of empowerment and dignity has shown to be essential for successfully returning to work, and minimizing the costs injuries can inflict on a worker's personal and familial life.

Baril and colleagues observed that the motivation on the part of the worker is crucial in the success of the RTW process, which in turn is contingent on the willingness of the employer and healthcare provider to trust and support the worker, as well as on the workplace culture itself (Baril et al. 2003b).

Despite the existence of a large canon of literature on the importance of social support in the workplace, very little empirical research has been published on its impact on return to work post-injury. Qualitative studies have revealed the importance of strong relationships between workers, coworkers, and their supervisors with regard to RTW (Baril et al. 2003b; Gates 2000); low supervisor support has been associated with longer time off work for employees (Väänänen et al. 2003). Labriola et al. (2006) found that the risk of long-term sickness absence among 1610 employees from 52 Danish companies increased with lower supervisor support. Krause and colleagues found that low supervisor support for an injured employee prolonged the employee's time away from work (Krause et al. 1997; Krause et al. 2001a).

Positive supervisor behaviors include modifying job tasks and duties to allow an employee to return to work (Saksvik et al. 2002). Studies have found that a positive interactive communication between the supervisor and the employee on sick leave facilitates an early RTW (Holmgren and Ivanoff 2007; Nieuwenhuijsen et al. 2006). A recent article published by Munir and colleagues (Munir et al. 2012) described the development and testing of a tool which can be used to examine the behaviors of supervisors to support RTW of employees. This work found a strong correlation between Supervisors to Support Return to Work (SSRW) and lower perceived work limitations ($P = 0.0001$), greater job performance ($P = 0.001$), greater psychological well-being ($P = 0.0001$), lower psychological distress ($P = 0.001$), and greater job satisfaction ($P = 0.0001$) (Munir et al. 2012). In their examination of the determinants of duration of disability after work-related illness or injury, Krause and colleagues (Krause et al. 2001b) found numerous studies which revealed low job seniority (Krause et al. 1997; Krause et al. 2001a) and low job control (Kristensen 1991).

Hepburn and coauthors (2010) interviewed workers after a workplace-based lost time injury to gauge if workplace response (early contact with worker, ergonomic assessment, presence of designated coordinator, accommodation offer) affected injured workers' subsequent attitudes and mental health. They found that early contact and supervisor reactions were significant predictors of fairness perceptions for the returning worker (Hepburn et al. 2010). Stewart and colleagues (Stewart et al. 2012) conducted interviews with injured workers and used a grounded theory methodology to analyze the qualitative data. They found that expectations of return to work were constructed based on perceived uncertainty, which subsumes five interrelated categories: (1) perceived lack of control over the return to work process, (2) perceived lack of recognition by others of the impact of the injury, (3) perceived inability to perform the pre-injury job, (4) fear of reinjury, and (5) perceived need for workplace accommodations. Expectations, once formed, were influenced by the worker's experience of coping with perceived uncertainty. The authors concluded that perceived uncertainty plays a key role in injured workers' formation of expectations of return to work.

Baril and colleagues found several themes common across three Canadian provinces, including the importance of trust, respect, communication, and labor relations in the failure or success of RTW programs for injured workers (Baril et al. 2003b).

Dekkers-Sánchez and colleagues (Dekkers-Sánchez et al. 2011) interviewed vocational rehabilitation professionals working with employees returning to work after prolonged workplace absence (more than 18 months) and found that the use of combined interventions involving the worker and his/her environment was considered the best way to address the multi-causality of work disability and could help maximize RTW outcomes.

A recent systematic review (Campbell et al. 2013), however, found no effect of coworker, supervisor, or general work support on risk of new onset back pain. Nevertheless, they did find weak effects of employment support for recovery and RTW outcomes: greater levels of coworker support and general work support were found to be associated with less time to recovery or return to work.

19.5 Transfer of Knowledge

In this section we will discuss best practices and recommendations regarding organizational policies and practices in the workplace that should facilitate RTW.

19.5.1 At the Macro Level

It is imperative that society remains sensitive to the rights and needs of workers in order for RTW to exist, let alone flourish. There are many "on the ground" facets to RTW, but without a culture supporting the rights of workers, there is little chance of a RTW program thriving. It is therefore desirable to promote government legislation as well as policies and practices by workers' compensation authorities that encourage employers to implement appropriate RTW programs.

19.5.2 At the Meso Level

It is important that workplaces invest in employees as much as possible while creating a culture of safety that will aid in keeping workers safe. A positive workplace culture should already be in place before the injury, but if not, steps can be taken to build a positive sense of team, camaraderie, and meaningful work for employees to ensure workers feel valued.

Workplaces must also focus on prevention efforts to avoid injuries. In order to do this, small organizations may want to involve sectoral associations in their jurisdictions so as to tap into knowledge, resources, and ideas. Properly trained and empowered joint health and safety committees, or workplace committees of this nature, can also be useful in identifying potential workplace hazards so these can be addressed before injuries arise (Yassi et al. 2012).

Within the RTW process, it has been shown that giving workers access to case managers (or similar workplace players) to answer questions or concerns they may have regarding how rehabilitation, accommodation, and compensation systems work, timelines, and their rights and responsibilities, can help to ensure that workers feel empowered. Allowing workers to be involved in deciding facets of their RTW (days/hours to work, working from home, tasks) is also important in a successful RTW.

19.5.3 At the Micro level

Within the workplace, at the microlevel, early communication with the employee to facilitate RTW (if/when appropriate) is important. Workers need to feel supported but not "forced" to come back to work – this can be a delicate balance. The existence of an RTW coordinator to act as a buffer between supervisor and employee where appropriate can be helpful in this regard.

Within the workplace unit, teamwork instead of hierarchy has been shown to be a powerful motivator in a successful RTW. Also, ensuring a worker knows he/she is a valued member of the work unit not just when injured but throughout their employment is key.

Finally, educating coworkers about RTW and support from coworkers are crucial in ensuring successful RTW. This factor is tied to workers feeling part of a larger team and an overarching goal that will help to ensure they know they are missed at work.

19.6 Concluding Remarks

This review of the literature indicates that the main barriers to RTW include ineffective communication between the different stakeholders (Friesen et al. 2001; Guzman et al. 2002; Ouellette et al. 2007); the lack of goodwill from the worker, the workplace, or the coworker (MacEachen et al. 2006); and delays (Friesen et al. 2001). The coordinated involvement of all stakeholders is key in successful RTW. In successful RTW programs, the needs of all stakeholders are identified and considered, and systematic policies are developed in response (Guzman et al. 2008; Maiwald et al. 2011). Involving all stakeholders, including unions, the treating physician, and insurer, in planning and implementation of RTW policies and programs is advised (Friesen et al. 2001). This approach has been termed "getting all the players on side" (Frank et al. 1998), and it is a key factor in successful RTW (Ouellette et al. 2007).

Workplaces that demonstrate teamwork, trust, and credibility among all stakeholders are more successful at RTW. Formal policies and positive relationships alone are insufficient in ensuring successful RTW (Friesen et al. 2001). Our own research (Badii et al. 2006; Davis et al. 2004; Friesen et al. 2001; Guzman et al. 2002, 2008; Maiwald et al. 2011; Ouellette et al. 2007; Yassi et al. 1995, 2000), as well as that of others (Frank et al. 1998), has highlighted that multiple factors and systems interact to influence RTW.

In summary, RTW is best understood within the macro-, meso-, and microsystems (Tjulin 2010); the action of one policy, or even one person, within a system impacts responses within other systems. For example, the perceived unwillingness of a worker to cooperate with RTW (microsystem) can be the result of an unsupportive supervisor or uninformed coworkers (microsystem) or a workplace that does not have policies that facilitate involving him/her in modified work assignment (mesosystem) or addressing insurance policies that are excessively complex or restrictive (macrosystem). Essentially, if a problem impedes successful RTW, it is rarely the fault of one lone player. It is under this premise that some employers have successfully adjusted their policies on RTW, taking into account all stakeholders within the macro-, meso-, and microsystems involved.

Note that each jurisdiction or country's workers' compensation systems have their specific characteristics, and the above is a general overview only.

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20

Cognitive-Behavioral Approach to Return to Work

Michael J.L. Sullivan

20.1 Introduction

Accumulating research highlighting the important role of psychological factors in pain outcomes has prompted the development of psychological interventions for pain. Cognitive-behavioral theory has been the dominant conceptual framework that has guided the development of psychological interventions for individuals suffering from pain conditions. In brief, cognitive-behavioral theory proposes that individuals' beliefs, interpretations, and appraisals about their pain will have a significant impact on their physical and emotional well-being. It follows that intervention techniques aimed at targeting pain-related beliefs, interpretations, and appraisals might contribute to more positive health and mental health outcomes.

Cognitive-behavioral therapy (CBT) (as applied to pain conditions) does not refer to a specific program of treatment. Rather cognitive-behavioral therapy can best be construed as a collection of psychological or behavioral techniques that have as a primary objective fostering adaptive cognitive and/or behavioral responses to pain. Cognitive-behavioral techniques vary widely in their characteristics and their intended impact. Techniques are aimed at reducing the severity of physical or emotional symptoms, promoting reengagement in important life activities, and fostering more effective self-management. Some techniques might be combined into a structured program of treatment, while others might be delivered as brief stand-alone interventions.

Another complicating factor is that cognitive-behavioral interventions are often included as one component of multipronged or multidisciplinary treatment programs for chronic pain. While cognitively oriented multidisciplinary pain programs have been shown to be effective, it is difficult to evaluate the specific contribution of the psychological components of these programs.

The objective of this chapter will be to briefly summarize the nature and effectiveness of different cognitive and/or behavioral interventions that have been developed for individuals suffering from pain conditions. The review will focus primarily on interventions that were intended to reduce pain-related disability (e.g., work disability) as opposed to interventions that were intended to reduce symptom severity.

20.2 Psychological Treatment for Pain Conditions

By the mid-1960s, mounting clinical and scientific evidence was suggesting that traditional medical approaches to the management of pain-related health conditions were limited in their

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impact. Increasingly, there were calls for a model of pain that would consider both the psychological and physiological mechanisms involved in pain perception. The call was most compellingly answered by Melzack and Wall's gate control theory (GTC) of pain (1965). The GCT in many ways revolutionized pain research. Not only did the theory propose a multidimensional conceptualization of pain that included psychological processes, but it helped explain clinical pain phenomena such as injuries without pain and pain that existed in the absence of discernible lesion (Wall 1979). From an applied perspective, the work of Melzack and Wall laid the foundation for behavioral conceptualizations of pain (Fordyce et al. 1968) and contributed ultimately to the development of biopsychosocial models of pain (Gatchel et al. 2007; Turk 1966). Current biopsychosocial models of pain propose that a complete understanding of pain experience and pain-related outcomes requires consideration of physical, psychological, and social factors (Gatchel et al. 2007; Keefe and France 1999; Turk 1966; Waddell 1998).

The following section briefly reviews approaches to the management of pain-related health conditions that have made use of cognitive and behavioral concepts or techniques. The review is selective as opposed to exhaustive, with emphasis on interventions that have been systematically evaluated. Where possible, references to clinical manuals are provided for readers who are interested in learning more about the specific intervention techniques described.

20.2.1 Behavioral/Operant Programs

The first programs that specifically targeted the psychological aspects of pain-related disability were based on the view that pain-related disability was a form of "behavior" that was maintained by reinforcement contingencies. In the 1960s and 1970s, Wilbert Fordyce and his colleagues applied the concepts of learning theory to the problem of chronic pain (Fordyce 1976; Fordyce et al. 1968). The focus of Fordyce's approach to treatment was not on reducing the experience of pain, but on reducing the overt display of pain. The targets selected for treatment were pain behaviors, such as distress vocalizations, facial grimacing, limping, guarding, medication intake, activity withdrawal, and activity avoidance (Fordyce et al. 1982).

The first behavioral approaches to the management of pain and disability were conducted within inpatient settings that permitted systematic observation of pain behaviors, as well as control over environmental contingencies influencing pain behavior (Fordyce 1976). Staff were trained to monitor pain behavior and to selectively reinforce "well behaviors" and selectively ignore "pain behaviors" (Fordyce et al. 1982). Results of several studies revealed that the manipulation of reinforcement contingencies could exert powerful influence on the frequency of display of pain behaviors (Fordyce et al. 1985). The manipulation of reinforcement contingencies was also applied to other domains of pain-related behavior and shown to be effective in reducing medication intake, reducing downtime, and maximizing participation in goal-directed activity.

A number of clinical trials on the efficacy of behavioral treatments for the reduction of pain and disability yielded positive findings (Sanders 1996). However, given the significant resources required to implement contingency management interventions, issues concerning the cost-efficacy of behavioral therapy for pain and disability were voiced. Concern was also raised over the maintenance of treatment gains since reinforcement contingencies outside the clinic setting could not be readily controlled. In order to increase access and reduce costs, behavioral treatments were modified to permit their administration on an outpatient basis. This change in delivery format compromised to some degree the control over environmental contingencies and required greater reliance on self-monitoring and self-report measures (Sanders 1996).

20.2.2 Back Schools/Information and Education Interventions

Although back schools were originally developed in the late 1960s, the first published reports of the benefits of "back schools" only appeared in the literature in the early 1980s (Zachrisson-Forsell 1981). The structure and content of back schools and other information/education interventions proceed from the view that "information" or "knowledge" can be powerful tools to effect reductions in distress or change in behavior (Heymans et al. 2004).

There are different pathways by which information might impact on pain outcomes. For example, if an individuals' emotional distress is caused by inaccurate information about the severity of his or her health condition, the provision of accurate information might facilitate reappraisal of the threat value of the clients' symptoms, and in turn, reduce emotional distress (Staal et al. 2003). Reductions in emotional distress might also contribute to reductions in pain severity. If an individuals' level of disability is caused by inaccurate beliefs about the potential adverse consequences of activity, the provision of accurate information might contribute to more adaptive beliefs promoting activity involvement as opposed to activity avoidance (Waddell and Burton 2001). It has also been suggested that pain education might impact on central mechanisms of nociceptive processing (Moseley and Flor 2012).

Back schools have varied widely in terms of content, duration, and the intervention disciplines used to administer the interventions. The duration of back school interventions has ranged from a single information session to a 2-month inpatient program (van Tulder et al. 2002). Back school interventions have tended to use group formats with a didactic format where participants might be exposed to information about physiology, biomechanics, posture, ergonomics, exercises, nutrition, weight loss, attitudes, beliefs, and coping. As a function of the type of information being provided, the interventionist might be a physician, physiotherapist, occupational therapist, nurse, or psychologist (Linton and Kamwendo 1987).

There has been a recent resurgence of interest in the use of education as a pain management approach for individuals with chronic pain (Moseley 2003). Moseley et al. (2004) compared the effects of pain neurophysiology education to an educational intervention that focused mainly on the anatomy and physiology of the bones of the lumbar spine. The pain neurophysiology education was delivered one-on-one and consisted of an initial didactic lecture and a series of ten workbook-based modules that participants were asked to complete within the next 2 weeks. Results showed that the pain neurophysiology group, compared to the back education group, led to superior changes in pain-related beliefs, pain catastrophizing, and self-reported disability.

Recent reviews of randomized clinical trials of back school programs concluded that (a) back schools yielded benefit relative to treatment-as-usual interventions, (b) the treatment effect size was small, and (c) back school programs implemented within occupational settings appeared to yield the most positive outcomes (Heymans et al. 2005; Meng et al. 2011). This research suggests that educational/information interventions might be useful components of multipronged approaches to the management of pain and pain-related disability but might have limited impact as stand-alone interventions.

20.2.3 Cognitive-Behavioral Interventions

Cognitive-behavioral interventions for the management of pain and pain-related disability began to appear in the 1980s (Turk et al. 1983). Cognitive-behavioral interventions incorporated concepts drawn from earlier behavioral approaches as well as information-based approaches used in back schools. Cognitive-behavioral approaches proceed from the view that individuals' beliefs, attitudes, and appraisals will play a role in the manner in which they will be able to adapt to the challenges associated with persistent pain. The objective of many CBT programs is to equip individuals with the psychological "tools" (e.g., coping skills) necessary to adequately meet the challenges of living with persistent pain (Linton et al. 1989; Linton and Ryberg 2001; Turk et al. 1983).

The intervention techniques included under the heading of cognitive-behavioral interventions vary widely and may include self-instruction (e.g., motivational self-talk), relaxation, or biofeedback, developing coping strategies (e.g., distraction, imagery), increasing assertiveness, minimizing negative or self-defeating thoughts, changing maladaptive beliefs about pain, and goal setting (Keefe et al. 2005; Kerns et al. 2011; Turk et al. 1983). A client referred for cognitive-behavioral intervention may be exposed to varying selections of these strategies. Originally, cognitive-behavioral interventions for pain-related conditions were offered primarily by psychologists (Linton et al. 1989). A number of reports have been published demonstrating the effectiveness of cognitive-behavioral interventions offered by nonmental health professionals such as nurses, physical therapists, and occupational therapists (George et al. 2008; Hay et al. 2005). Alternate delivery formats such as Internet-based treatments have also been shown to be effective approaches for cognitive-behavioral interventions for pain (Macea et al. 2010; Palermo et al. 2009).

Cognitive-behavioral interventions are typically offered over a period of several weeks (6–10 weeks), where an individual might meet with a therapist weekly, either individually or in groups (Linton and Ryberg 2001; Sullivan, Ward et al. 2005). The pain-related outcomes targeted by cognitive-behavioral interventions might include pain reduction, distress reduction, increased activity involvement, or return to work (Gatchel et al. 2007; Linton and Ryberg 2001). Cognitive-behavioral interventions are currently considered the psychological treatment of choice for individuals coping with chronic pain and disability (Gatchel et al. 2007; Linton 2000; Turk 2002). A number of clinical trials have demonstrated that these types of interventions can lead to clinically significant decreases in pain, emotional distress, and disability (Linton 2000; Linton and Ryberg 2001; Turk 2002; Williams et al. 1996).

Numerous systematic reviews have concluded that multidisciplinary pain management programs with a cognitive-behavioral orientation can yield important reductions in physical and emotional distress, as well as improvement in functional abilities (Gatchel et al. 2003; Guzman et al. 2002; Rogerson et al. 2010). Multidisciplinary pain management programs have also widely varied in terms of content, structure, and duration (Main et al. 2007). Some interventions involve individual treatment, while others use group formats; some have taken the form of structured standardized programs, while others might be individually tailored (Guzman et al. 2002). Some programs have taken the form of intensive residential treatment, while others have provided treatment on an outpatient basis. By definition, multidisciplinary disciplinary pain management programs have representation of a number of intervention disciplines. In spite of the wide variation in the structure, content, and delivery format of multidisciplinary pain management programs, research has tended to support their effectiveness (Dysvik et al. 2004; Guzman et al. 2002; Main et al. 2007; McAllister et al. 2005; Rogerson et al. 2010).

20.2.4 Stress Management Programs

Stress management programs represent a special case of cognitive-behavioral intervention. Stress management programs proceed from the view that, unless properly managed, chronic stresses can lead to a depletion of the individual's physical and psychological resources, and turn, increase the individual's susceptibility to physical or psychological dysfunction (Lazarus and Folkman 1984). Stress management approaches are considered separately from cognitive-behavioral pain management programs since the focus of stress management programs is not necessarily on managing pain symptoms or disability. Furthermore, while cognitive-behavioral interventions are typically used for individuals who are work disabled due to their pain condition, stress management programs have been used as preventive interventions for individuals who are experiencing symptoms of persistent pain but are still working. The primary focus of stress management interventions might be on stressors within the workplace or the individual's personal stressors (Feuerstein et al. 2000; 2004).

Problem-solving therapy is a variant of stress management programs that has recently been applied to individuals who are work disabled due to musculoskeletal pain conditions (D'Zurilla 1990; Smeets et al. 2008; van den Hout et al. 2003). Problem-solving therapy proceeds from the view that life stresses can be minimized if the individual is able to use appropriate problem-solving strategies to deal with difficult situations that might be encountered at the workplace or in daily life (D'Zurilla 1971; Nezu and Perri 1989). Problem-solving intervention programs will typically span several weeks (8–10 weeks) and might involve didactic lectures, group discussion, and homework assignments (Gallagher 2006). The limited research that has addressed the efficacy of this form of intervention indicates that the addition of problem-solving therapy to usual treatment might improve return to work outcomes in individuals with disabling musculoskeletal pain (Smeets et al. 2008; van den Hout et al. 2003).

20.2.5 Acceptance and Commitment Therapy

Acceptance and commitment therapy (ACT), also referred to as contextually based cognitive behavior therapy, is a type of cognitive therapy that has evolved from Stephen Hayes' work on acceptance and adaptation (Hayes et al. 1999; McCracken 2005). Proponents of ACT emphasize that they do not use the term acceptance to refer to resignation, but rather as a term to refer to the process of ceasing to struggle ineffectively against that which cannot be changed (Hayes et al. 1999). In the case of chronic pain, acceptance is viewed as a first step toward successful adaptation (McCracken 2005). Acceptance is said to occur when the individual with chronic pain is willing to experience his or her pain without attempting to control it. Through treatment, individuals with chronic pain are taught to acknowledge their pain, observe it as a sensation, and then accept it as part of their reality without judgment. Through treatment, individuals are also encouraged to focus on their values and to commit to activities consistent with their values, in spite of ongoing pain.

Several investigations have shown that ACT is effective in reducing pain intensity and self-reported disability (McCracken and Eccleston 2006; McCracken et al. 2005; Vowles and McCracken 2008). To date, ACT has only been used with individuals with long-standing chronic pain where the prospect of significant pain alleviation is realistically low. When symptom-focused treatment of the pain condition is unlikely to yield positive outcomes, acceptance-based interventions might represent a useful option for improving the quality of life of individuals with chronic pain. It is not clear whether ACT would be effective, or even appropriate, for individuals with recent onset pain where a substantive proportion of individuals would be expected to show significant recovery from their pain condition.

20.2.6 Cognitive Processing Therapy

Cognitive processing therapy (CPT) is a form of cognitive-behavioral therapy that has been tailored to the needs of individuals with post-traumatic stress disorder (PTSD) (Alvarez et al. 2011; Forbes et al. 2012). CPT includes a variety of cognitive-behavioral techniques such as thought monitoring and the identification and modification of problematic beliefs and cognitions. In addition, CPT includes an exposure element where clients are asked to describe, repeatedly, in writing, situations that are associated with their PTSD symptoms. Trauma-related descriptions are discussed in session, such that the clinician can assist the client in identifying and challenging maladaptive cognitions. Monson et al. (2006) showed that CPT, compared to a waitlist control, was effective in reducing the frequency and severity of PTSD symptoms in a sample of military veterans.

Otis et al. (2009) have recently described an integrated treatment program that combines elements of CPT and non-pharmacological pain management techniques for military veterans with PTSD and concomitant chronic pain. Given that pain symptoms can act as "triggers" for PTSD symptoms, Otis et al. (2009) argued that an optimal approach to the treatment of military veterans with PTSD and chronic pain might be the one that simultaneously addresses both problems. The integrated treatment developed by Otis et al. consists of 12 one-hour sessions. Educational and cognitive techniques (e.g., thought monitoring, reappraisal, cognitive restructuring) are used in the initial sessions to address maladaptive thoughts and beliefs that might be contributing to symptoms of PTSD and pain. Psychophysical techniques (interoceptive exposure and relaxation) are used to address anxiety, and behavioral goal setting is used to address avoidance. A number of sessions are also devoted to dealing with intra- and interpersonal affective correlates of PTSD such as power, control, anger, safety, trust. and intimacy. Pilot testing has revealed that an integrated approach to PTSD and chronic pain might yield meaningful reductions in symptoms of PTSD and PTSD-related disability (Otis et al. 2009). Integrated programs, such as that described by Otis et al. (2009), might yield benefit for individuals with debilitating musculoskeletal conditions whose onset was associated with a traumatic event.

20.2.7 Risk Factor-Targeted Interventions

Recent research on risk factors for prolonged pain and disability has prompted the development of risk factor-targeted intervention programs (Gauthier et al. 2006; Sullivan, Feuerstein et al. 2005; Thorn et al. 2002; Vlaeyen et al. 2001; Vlaeyen and Linton 2000). The Progressive Goal Attainment Program (PGAP) was designed as a risk factor-targeted intervention for individuals suffering from debilitating pain conditions (Sullivan et al. 2006a). The primary goals of the PGAP are to reduce catastrophic thinking, fear of movement, perceived injustice, and disability beliefs in order to promote reintegration into life-role activities, increase quality of life, and facilitate return to work. The intervention is typically delivered by occupational therapists, physiotherapists, or psychologists.

Since the PGAP is a risk factor-targeted intervention, clients are only considered as potential candidates for the intervention if they obtain scores in the risk range on measures of catastrophic thinking, fear of movement, or disability beliefs. In the initial weeks of the program, the focus is on the establishment of a strong therapeutic relationship and the development of a structured activity schedule. The client is provided with a client workbook that serves as the platform for activity scheduling and contains the forms for various exercises that will be used through the treatment. Activity goals are established in order to promote resumption of family, social, and occupational roles. Intervention techniques are invoked to target specific obstacles to rehabilitation progress. In the final stages of the program, the intervention focuses on activities that will facilitate reintegration into the workplace (Sullivan et al. 2006a).

The PGAP has been shown to be effective in reducing catastrophic thinking, fear of movement, perceived injustice, and disability beliefs in individuals with whiplash injuries and work-related musculoskeletal injuries (Adams et al. 2007; Sullivan and Adams 2010; Sullivan et al. 2006a). In a number of studies, the PGAP has been shown to have its greatest impact on reducing levels of catastrophic thinking, and treatment-related reductions in catastrophic thinking have been associated with improved return to work outcomes (Sullivan and Adams 2010; Sullivan et al. 2006a). Recent studies have also supported the use of the PGAP as a return to work intervention for long-standing musculoskeletal conditions and fibromyalgia (Adams et al. 2007; Sullivan et al. 2012). A recent demonstration project has shown that telephonic delivery of PGAP might also be effective in facilitating occupational reintegration in work-disabled individuals with musculoskeletal conditions (Sullivan and Simon 2012).

20.2.8 Graded Activity and Exposure

The premise underlying graded activity or exposure interventions is that pain-related disability can be construed as a type of phobic orientation toward activity (Vlaeyen and Linton 2000). According to the fear-avoidance model, individuals will differ in the degree to which they interpret their pain symptoms in a “catastrophic” or “alarmist” manner. The model predicts that catastrophic thinking following the onset of pain will contribute to heightened fears of movement. In turn, fear is expected to lead to avoidance of activity that might be associated with pain (Vlaeyen and Linton 2000). Prolonged inactivity is expected to contribute to depression and disability (Sullivan et al. 2006b). According to the fear-avoidance model, reducing fear of movement is a critical component of successful rehabilitation of individuals with debilitating pain conditions (Vlaeyen and Linton 2000).

Graded activity and exposure to feared activities are treatment approaches that involve systematic exposure or engagement in activities that individuals avoid due to fears that they might experience an exacerbation of their symptoms. Feared activities are initially identified and ranked hierarchically, from the least to most feared activities (Vlaeyen et al. 2002a). Beginning with the least feared activities, clients are systematically exposed to movements that comprise the activities that clients are currently avoiding. Clients are repeatedly exposed to specific movements until their fear of activity subsides. As clients overcome their fears associated with the least feared activities in their feared activities hierarchy, the exposure techniques are used on activities associated with higher levels of fear (Leeuw et al. 2007; Vlaeyen et al. 2002b).

While graded activity and exposure have been shown to be effective interventions for reducing the fear of specific movements, the effects of treatment do not seem to generalize to un-targeted activities (Crombez et al. 2002; Goubert et al. 2002). As such, the clinical significance of the intervention might depend on the degree to which important activities of daily living or occupational activities can be targeted. Graded activity and exposure interventions aimed at reducing fear of movement have been shown to be effective in reducing disability, reducing absenteeism, and facilitating return to work (Bailey et al. 2010; Vlaeyen et al. 2001).

20.3 Considerations for Choosing Among Intervention Approaches

The intervention approaches described in this chapter differ in terms of their focus, structure, content, and objectives. With the range of potential intervention avenues currently available, the clinician might reflect on the question of which intervention approach might be most suitable for a particular client. Since little research has been conducted on matching client profiles to specific interventions, this question, unfortunately, cannot be addressed purely from an empirical standpoint. There are however various points of consideration that might assist the clinician in determining the most appropriate intervention for his or her client.

Few would question the importance of information provision in the management of chronic pain and disability. The more the clients understand about the nature of their pain condition, the more they will be able to play an active role in the management of their condition. As such, information-based approaches, for example, back schools, might be important elements of the management of pain-related disability. However, for most clients with pain conditions, information alone is unlikely to yield clinically significant improvements in work disability. Information-based techniques might best be viewed as important elements of a more comprehensive, multifaceted approach to treatment as opposed to stand-alone interventions.

For the greater part of the last two decades, psychosocial interventions were included primarily as part of tertiary care treatment for clients with long-standing chronic pain and disability (Gatchel 2004). With little expectancy of clinical improvement of clients’ pain conditions, the focus of many treatment programs was primarily on the alleviation of suffering. Cognitive-behavioral interventions that used distress reduction techniques such as relaxation, reappraisal, and cognitive restructuring were ideally suited to achieve reductions in suffering in clients with long-standing chronic pain (Morley et al. 1999). As research accumulated showing that psychological interventions yielded significant reductions in pain and emotional distress, there was greater interest in using psychological interventions for clients who were at earlier stages of chronicity (Gatchel 2004; Sullivan 2003).

The term secondary prevention is used to describe interventions that are implemented for individuals considered "at-risk" condition or chronic pain and disability but whose condition had not yet become chronic. With a less chronic population, treatment objectives of psychological interventions changed. Since many clients still had an employment-relevant skill set, and some might also have had a job to return to, there was an increased focus on return to function as a central objective of treatment, as opposed to a primary focus on reduction of suffering.

When treatment is initiated after a long period of chronicity, intervention strategies are more likely to address the consequences of pain and disability (e.g., affective disorders, drug/alcohol overuse, or family dysfunction) as opposed to risk factors for pain and disability. It is important for professionals working with clients with long-standing chronic pain and disability to be able to detect signs of mental health problems in order to orient the client to appropriate mental health interventions. Cognitive-behavioral interventions or cognitive processing therapy might be particularly well suited for individuals with debilitating pain conditions who also suffer from a mental health condition such as depression or PTSD.

It is important to consider that risk factors for chronicity (e.g., catastrophizing or pain-related fears) are neither psychological disorders per se nor they would necessarily be considered indices of dysfunction in the absence of a pain condition. Nevertheless, their presence contributes to a higher probability that a pain condition will persist or worsen over time. The challenge to effective secondary prevention lies not only in the development of risk factor-targeted interventions but in developing mechanisms by which individuals at risk can be identified. Given the robustness of the predictive value of psychosocial risk factors for problematic recovery, a case could be made for the inclusion of measures of psychosocial risk as part of routine evaluations of work-disabled individuals presenting for treatment in primary care or rehabilitation.

The inclusion of measures of psychosocial risk in primary care and rehabilitation is far more common today than it was a decade ago. However, the assessment of psychosocial risk is only meaningful if the results of such assessments are used to guide treatment. Unfortunately, it is probably more the exception than the rule that an assessment of psychosocial risk in primary care or rehabilitation will be used to tailor intervention to a client's psychosocial problems or needs. More likely is that the same intervention approach is offered to everyone, regardless of the outcome of a psychosocial risk evaluation.

As risk factor-targeted interventions are developed, it might be possible to match intervention strategies to a client's psychosocial risk profile. Research by Gatchel and his colleagues suggests that such risk/treatment matching approaches can yield significant improvements in function and are associated with important long-term cost savings (Gatchel et al. 2003; Gatchel and Mayer 2008; Whitfill et al. 2010). Emerging research suggests that individuals who present with a psychosocial risk profile characterized by high levels of catastrophizing might benefit from an approach similar to the PGAP. Other research suggest that individuals who present with a psychosocial risk profile characterized by high levels of pain-related fears might benefit from graded activity or exposure interventions. Stress management approaches might be suitable for individuals considered at risk for work disability, yet who are currently still employed. Acceptance-based interventions might be suitable for individuals with long-standing pain and disability for whom the probability of return to gainful employment might be considered very low. It is important to consider these suggestions as speculative given the current paucity of research addressing the relative advantages of matching interventions to clients' risk profiles.

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Motivational Interviewing for Enhancing Return to Work

21

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21.1 Introduction

Making the shift from being unemployed to being employed requires active client involvement and participation. Although other factors, such as positive outcome expectancies, perceived energy, and positive psychological functioning, may also contribute to successful return to work following an injury (e.g., Schultz et al. 2005), client motivation plays a vital role in determining whether or not the client is able to obtain and sustain employment.

Motivational interviewing (MI) is a therapeutic approach that is specifically designed to increase motivation for adaptive behavior change. MI has been defined as "… a client-centered, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence" (Miller and Rollnick 2002 p. 25). It consists both of a general way of interacting with clients (that is permissive and collaborative) and a set of specific clinical strategies that increase the probability that the client will engage in a targeted behavior (such as return to work).

MI was originally developed to help individuals reduce drinking problem (Miller et al. 1993), but it was soon adapted to address other health-related behaviors and issues, such as weight control (Smith et al. 1997), smoking (Brown et al. 2003; Colby et al. 1998; Velasquez et al. 2000; Wakefield et al. 2004), HIV risk reduction (Harding et al. 2001), healthy eating habits (Resnicow et al. 2001), general substance abuse (Carroll et al. 2001; McCambridge and Strang 2004; Miller et al. 2003), treatment adherence (Parsons et al. 2005), and exercise (Ang et al. 2007).

MI could also be applied to increase motivation for return to work behaviors. In fact, a recent study supported its potential efficacy for this application (Schultz et al. 2008). In this study, 35 individuals (17 of whom were determined to be at high risk for protracted disability) who had recent (within 4–10 weeks) work-related back pain were given an interdisciplinary early intervention program to facilitate return to work. All members of the interdisciplinary team (which included a physician nurse advisor, psychologist, vocational rehabilitation consultant, case manager, and team administrative assistant) received training in MI. Relative to workers who were given standard care within the workers' compensation system, by 6 months post-back pain onset, the injured workers who had been classified as being at high risk for protracted disability and who participated in the intervention program

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were more likely to return to work than the high-risk workers who received conventional case management. The findings from this preliminary study suggest that the use of MI for enhancing RTW may be most effective for those individuals who are at greatest risk for long-term disability.

This chapter has been prepared for professionals involved in RTW process interested in learning about the application of MI for facilitating greater motivation to return to work in their clients. The material presented in this chapter is based largely on the descriptions of MI published by its developers, William Miller, Steven Rollnick, and their colleagues (e.g., Miller and Rollnick 2002; Rollnick et al. 2008). The reader is encouraged to read these primary sources for more detailed information about the motivational strategies described here.

The chapter has two sections. In the first section, three key concepts underlying the use of MI are discussed. The second section reviews a number of specific counselor behaviors and responses that (1) enhance client motivation to consider new approaches to a problem, (2) strengthen a client's commitment to a plan of action, and (3) encourage continued client participation in a change plan and maintenance of any lifestyle changes made. When possible, the discussions in this chapter will focus on how these concepts and strategies can be applied to behavior change associated with return to work.

21.2 Key Concepts of Motivational Strategies

A description of the theoretical underpinnings of motivational approaches is presented in Miller and Rollnick (2002). For the motivational counselor, three of these concepts are especially important: (1) viewing motivation as a probability of behavior change that can fluctuate over time; (2) understanding the importance of the counselor's role for facilitating client motivation to change; and (3) understanding that behavior change as a multistage process. Each of these concepts will be discussed in turn.

21.2.1 Motivation as a Probability

Traditionally, motivation is viewed as something that resides *inside* the client or injured worker. Lack of behavior change or resistance to suggestions for steps needed to return to work was viewed as an indication of a *client* deficit in motivation: "this client must not really want to get back to work; he/she refuses to cooperate with or actively participate in a return to work plan." An alternative view, and one that provides more hope that counselors can influence client motivation, is to view motivation as a *probability*. In this view, the probability that the client will comply with treatment recommendations (e.g., "motivation") depends, in large part, on the atmosphere in which treatment recommendations are made. Thus, from a MI perspective, "…motivation is in many ways an interpersonal process, the product of an interaction between people" (Miller and Rollnick 2002 p. 22). The most important point regarding motivation is this: *What the counselor does and says in response to the client influences the client's motivation for and probability of returning to work.*

21.2.2 Creating an Atmosphere for Change

Vocational counselors sometimes take on the role of an expert to whom injured workers go to seek advice. In this role, the counselor, usually after a careful evaluation, gives the injured worker feedback and recommendations. The recommendations may include referrals for evaluation, treatment (e.g., medication management, supervision of physical therapy, cognitive behavioral therapy), or additional vocational training. The client is expected to agree with the expert and then follow through with the recommendations. As alluded to already, such an approach can work well when the client agrees that the counselor's recommendations are sound.

However, having the vocational counselor take on the "expert" role works less well when the client does not see how the recommendations will help or—worse yet—believes that the recommended approach might cause more problems in the long run. In this case, the client may feel that the evaluation was incomplete or that the counselor "did not listen to" or "does not understand" him or her. An adversarial relationship can result where the counselor becomes frustrated with the client for not following through with the recommendations and the client becomes frustrated with the counselor for withholding a desired treatment that the client believes could end his or her suffering. This scenario is not uncommon in injured worker–counselor relationships; here, the injured worker is less likely to follow through on recommendations, however sound and useful, and experiences a decrease in motivation.

An environment more conducive to adaptive behavioral change recognizes the workers' experiences, opinions, and feelings and communicates that recognition to the worker. Counselor responses that contribute to this environment differ markedly from the responses that would be expected from the traditional authoritative or advice-giving counselor. This includes asking (open-ended) questions, listening reflectively, summarizing, and affirming the worker. The goal of these motivational responses is to create an atmosphere of trust and cooperation that helps set the stage for behavior change.

Rather than acting as an authority whose primary job is to develop a list of recommendations (at least in the initial encounter), motivational counselors present themselves as coaches knowledgeable in a variety of treatments and approaches that can address barriers to the worker's goals. Motivational counselors spend more time listening than they do talking, and much of what they say represents attempts to clarify and understand the client's position. As described below, recommendations and advice, when made, are brief and are presented only when the client has indicated a willingness to consider alternative approaches. Moreover, whenever possible, recommendations are presented in the form of a "menu" of choices, and a behavior change plan unique to the client's own problem and situation is created in cooperation with the client.

Counselor responses that create an atmosphere of trust and cooperation help set the stage for behavior change; more specific responses that focus the client's attention on the desirability of behavior change are critical. Before these more specific responses can be described, a final concept needs to be explained: the concept of behavior change as a multistage process.

21.2.3 Behavior Change as a Multistage Process

Some injured workers may hope that their injury will be "cured" by time (rest), medication, or surgery and—importantly—that such a cure is necessary prior to them being able to return to work. They may want or expect something to be done "to" them and not be ready or prepared to take on the task of injury management and return to work themselves. However, a successful return to work ultimately depends more on personal action by the clients compared to what is done to them. Motivational strategies primarily aim to increase the probability that the client will engage in adaptive behaviors in the (near) future, i.e., participate in a return to work plan or approach. In order to facilitate this, counselors need to understand how change occurs. Prochaska and DiClemente have developed probably the most thorough model for behavior change (DiClemente and Velasquez 2002; Prochaska and DiClemente 1982; Prochaska et al. 1992a, b); they have studied, in detail, the process of change from maladaptive (e.g., smoking) to adaptive (e.g., not smoking) health behaviors.

According to the model that Prochaska and DiClemente developed, adaptive behavior change involves five stages (see Table 21.1). People who are not considering changing their behavior are in the **precontemplation** stage. Precontemplators see no need to change. They will show resistance when and if they feel coerced into changing some behavior that they do not view as a problem. Although precontemplator-injured workers may suffer because of the financial and social consequences of unemployment, they likely see their employment status as out of their control. Thus,

Table 21.1 Five stages of behavior change with respect to return to work

Stage	Description
Precontemplation	The client or injured worker does not think it is possible to take steps towards return to work. The client or injured worker will show resistance when asked or advised to change
Contemplation	The client or injured worker feels ambivalent about return to work. The client or injured worker can identify both pros and cons of return to work
Preparation	The client or injured worker has made the decision to take steps towards return to work. The client or injured worker has made initial steps towards return to work
Action	The client or injured worker is in the process of making concrete steps towards return to work
Maintenance	The client or injured worker is maintaining gainful employment
Relapse	The client or injured worker has been unable to maintain gainful employment

Adapted from Miller et al. (1992). Reprinted by permission of the publisher

they blame their (un)employment status on an injury or on their (previous) employer's lack of flexibility. Because of the belief that they cannot do anything to return to work, they may because frustrated or angry—or simply surprised—if a return to work plan is suggested to them.

Contemplation is a stage in which a person sees a need for change and may be considering making some change in the future. However, contemplators are not yet committed to change; they are in a constant state of weighing the pros and cons of changing their behavior. Contemplators might acknowledge that return to work might be a viable goal "someday," but they would also be aware of significant barriers to return to work.

Preparation (also known as the **decision-making** or **determination** stage) involves both the intent to make changes and some initial steps in the direction of change. Injured workers in the preparation stage express a willingness to try an approach or learn skills that would lead towards employment.

Individuals in the process of changing their behavior are in the **action** stage. Injured workers here follow through on the steps towards return to work. Individuals in the fifth stage, called **maintenance**, make efforts to sustain the changes made in the action stage. These would include individuals who were previously injured but are now working and engaging in adaptive coping responses that contribute to the maintenance of gainful employment.

Anyone unable to sustain changes made in the action stage is referred to as relapsed. From this point, injured workers may reenter the change cycle at any point (e.g., give up and become precontemplators or start right back in again at the action stage). People may, and often do, cycle through these stages several times before any change becomes permanent. Injured workers can even shift from one "stage" to another in a matter of minutes, depending in large part on the immediate responses of the vocational counselor.

There are some important characteristics about this stage model of change that influence how a counselor might think about and intervene with injured workers. First, the model predicts that people in different change stages should react differently to counselor behaviors, as a function of their change stage. For example, workers in the preparation and action stages should be more likely than people in the precontemplation stage to benefit from recommendations and treatment that require significant effort. Research supports this prediction, for both smoking cessation (Ockene et al. 1988) and weight control treatment (Prochaska et al. 1992a, b). A very important implication of this is *that not all clients are ready to start a return to work plan that requires significant effort on their part.* In fact, as described in more detail below, this model indicates that clients in different stages require different counselor responses to facilitate movement towards change.

21.3 Specific Motivational Strategies

Given this background, a review of specific strategies follows; counselors may use them to create an atmosphere of change and develop a return to work plan that the client can understand and endorse. Motivational strategies can be organized into three types: those that generally enhance motivation for change and which should therefore be used for clients who are in the precontemplation or contemplation stages, those that strengthen the commitment for change and should therefore be used with clients in the preparation and action stages, and those that follow-up on any return to work plan developed and that encourage maintenance of any changes made (Miller and the US National Institute on Alcohol Abuse and Alcoholism 1992; Miller and Rollnick 2002).

21.3.1 Strategies That Enhance Motivation for Behavior Change

Miller and colleagues (Miller and the US National Institute on Alcohol Abuse and Alcoholism 1992) describe five specific strategies that can be used with clients in the precontemplation and contemplation stages to help move them towards preparation and action. The first four, asking open-ended questions, listening reflectively, affirming the client, and summarizing the interaction, all build rapport and contribute to an atmosphere for change, that is, they all increase motivation. However, these strategies are common to many different forms of therapy. The fifth strategy, eliciting self-motivation statements, is unique to motivational interviewing and seeks to (1) support the client belief that change (i.e., return to work) is possible and (2) encourage the client to come up with his or her own reasons for change/return to work. Each of these strategies is described below and listed in Table 21.2.

21.3.1.1 Ask Open-Ended Questions

Open-ended questions are questions that tend to elicit clients' concerns, ideas, and feelings; they are excellent strategy early in an encounter when the counselor seeks information about the client relationship with and commitment to return to work. A good open-ended question is difficult to respond to with just a "yes" or "no." By encouraging the client to express the problem in his or her own words, open-ended questions demonstrate that the counselor is interested in the client perspective on the problem. Two examples of open-ended questions are presented in Table 21.2.

Often, time with a client is limited, and much material needs to be covered. Counselors may therefore be concerned that asking open-ended questions would open a Pandora's box of (time-consuming) complaints, thereby eating up all of the available time for a session or encounter. Some clients do require significant structure and limit setting in order to ensure that time to review material in a session is completed. However, paradoxically, by initially giving clients an opportunity to discuss their primary concerns, they are more likely to cooperate with the counselor to make the encounter as efficient as possible. Once they feel heard, they will feel less of a need to talk; they will also feel more understood and satisfied about the encounter.

Moreover, knowledge about the issues from the client's perspective may be helpful to enlist cooperation from the client for making the encounter even more efficient. For example, if time is starting to run out, the counselor can say, "I'm sorry, but we only have 15 minutes left for our scheduled time today. In order to make sure we address [the important issue you raised earlier], I will need to ask you several questions and then discuss with you where we should go from here. Is this alright?" The key here is not to use open-ended questions to encourage the client to ramble on for the entire session about anything

Table 21.2 Five strategies that enhance motivation to return to work

Strategy	Purposes	Examples
Ask open-ended questions	Encourages the client to talk. Helps establish an atmosphere of trust and acceptance	"Tell me your thoughts about getting back to work." "Part of my job is to help you meet your return to work goals. At this point, can you tell me about the things that will help you get back to work, as well as what might hinder you?"
Listen reflectively	Builds rapport. Reinforces motivational statements. Minimizes client resistance. Creates an environment conducive to change. Keeps focus on client's own arguments for and beliefs about change	Any statement that reflects your interpretation of what the patient has been trying to say, e.g., "You seem to be saying that…" "If I've heard you right, you hope to…"
Affirm the patient	Builds rapport. Enhances self-esteem. Encourages client responsibility. Can reinforce self-motivational statements	"You really want to provide for your family." "You're really working at this!" "I trust that you know what is best for you." "That took a lot of courage."
Summarize	Allows clients to hear self-motivational statements again Shows client that you have been listening carefully	"So far, you have told me…" "Our time for today is almost over. Let me summarize what you've said so far… What have I left out?"
Elicit self-motivational statements	Encourages clients to argue *for* return to work. Encourages the belief that return to work is possible	Ask questions that elicit problem recognition and concern ("What concerns you most about not having a job?"), intention to return to work ("What will be better for you and your family when you are working again?"), and optimism ("Do you think this will work?" "What do you need to do to increase the chances for success?"). Reflect back self-motivational statements as they occur. Affirm the client for considering change. Summarize the content of the encounter and include any and all self-motivational statements made

that comes to his or her mind. Rather, the counselor seeks to encourage the client to communicate the primary problem(s) that needs addressing from the client's own perspective. Beginning the encounter with an open-ended question is an effective way for doing this.

21.3.1.2 Listen Reflectively

Reflective, or empathic, listening, as originally described by Carl Rogers (1957; 1959), provides a therapeutic environment for clients to consider making difficult behavior changes more easily. This therapeutic strategy involves listening carefully to the client and then reflecting back accurately what the client has said. Reflective listening also acts to minimize client resistance, because it is more difficult to argue with someone seeking to understand you than with someone who is challenging you or lecturing you. Furthermore, and consistent with the goal of encouraging clients to convince themselves to engage in adaptive behaviors (see below), reflective listening keeps the client talking and therefore increases the chances that the client will say something that argues *for* getting back to work.

Given the high volume of both verbal and nonverbal communication that can occur with every client phrase, the counselor cannot hope to accurately reflect *everything* a client says. Through careful selection of what to reflect back to the client, reflective listening also may be used to emphasize and reinforce self-motivational statements related to return to work (discussed further under Sect. 21.3.1.5 below).

21.3.1.3 Affirm the Client

The motivational counselor seeks to affirm the client at every opportunity. Affirmations, in the form of direct compliments and praise, are thought to provide a more positive environment for change by increasing rapport, enhancing client self-esteem, encouraging client responsibility, and reinforcing client self-motivational statements (Miller et al. 1992). Affirming statements may be contrasted with reflective statements in that the former are sincere expressions of the *counselor's* positive responses to the client (e.g., "I admire your courage"), while the latter consist of efforts to reflect the *client's* concerns (e.g., "You really seem to be upset by this").

21.3.1.4 Summarize

Towards the end of every client encounter, even if that encounter was very brief, it is important to set aside a moment to summarize the basic content of the interaction. A summary serves an important opportunity for allowing clients to hear, yet again, any self-motivational statements they made during the encounter. However, it is also important to incorporate any concerns that the client may have raised that indicate ambivalence about return to work. This shows the client that the counselor really listened.

A summary need not be lengthy. For example, after a 5-min encounter that involved a client's request for funding to obtain a 4-year degree and a counselor's conclusion that complying with this request is not possible, the counselor could say:

> Even though we did not have much time to discuss the different options that are available for helping you get back to work, I think I have an initial understanding of the problem. You came today hoping that I would arrange for funding to obtain a Bachelor's degree, which you are sure would make it much easier for you to get a job. I explained that unfortunately, this is not something that the department can offer injured workers at this time. But I also said that this line of reasoning is helpful–you are thinking about different paths that might ultimately lead to a job that will help you pay your bills and feel more productive. Unfortunately, we did not have enough time today to address all your questions or review the different options that are available to you for helping you develop a return to work plan, and we agreed that I would see you again next week to discuss these options further.

21.3.1.5 Elicit Self-Motivational Statements

Perhaps what most sets the motivational strategies apart from other therapeutic approaches is the extent to which self-motivational statements are encouraged and reflected back to the client. Self-motivational statements may be defined as arguments for behavior change (e.g., "It's time I did something about this"; "Okay, I'm ready to try something new"; "I can't go on like this anymore"). The strategies of asking open-ended questions, listening reflectively, affirming the client, and summarizing, while basic to creating an atmosphere for change, would not effectively encourage change without a focus on eliciting self-motivational statements specifically.

The first step is to recognize self-motivational statements when they occur. Miller and Rollnick (2002) describe four categories of self-motivational statements. *Problem recognition* statements indicate that the client sees the problem behavior as having negative consequences ("We have had to give up our house because we can no longer afford the mortgage payments;" "I feel like a lump on a log and am bored all of the time."). *Expressions of concern* indicate that the client is upset or worried about his or her current situation ("I'm afraid I'm never going to be able to work"). *Intention to change* statements express an intention to make some change for the better or describe initial steps towards change ("I know I have to get back to work, and I will"). Finally, statements that reflect *optimism* indicate that the client believes he or she can be successful in making a positive change ("I think that if I take things a step at a time, I will be able to get myself back to work."). A primary goal of the motivational counselor is to ask questions and make comments that elicit such motivational statements and then (1) affirm the client for making such statements ("That's a really good point; not all the people I work with recognize that"), (2) reflect these statements back throughout the interaction (i.e., during the session, "So you now see that…"), and (3) summarize them at least a third time at the end of the session.

21.3.1.6 Summary of Preliminary Strategies

The goal of the initial motivational strategies is to enhance motivation for adaptive behavior change, that is, to encourage movement from precontemplation to contemplation and from contemplation to preparation. The strategies of asking open-ended questions, listening reflectively, affirming the client, and summarizing all can be used to elicit and reinforce self-motivational statements. In this way, the counselor creates an environment in which the client talks himself or herself into doing what is necessary to get back to work. The assumption of this approach, supported by social science research, is that change will occur more rapidly when and if clients convince themselves that change is both necessary and possible, than when counselors try and convince clients of these things (Bem 1967; Festinger 1957). These initial strategies should be used with precontemplators and contemplators until they enter, or are about to enter, the preparation and action stages.

Rapid progression (e.g., within minutes) towards the preparation or action stages, as indicated by frequent self-motivational statements, suggests that the client may be prepared to take action. At this point, the counselor should be ready to shift to the next set of strategies that strengthen commitment for behavior change. Slower progress suggests precontemplation and indicates that more time may be needed to enhance and build motivation for behavior change prior to the development of a return to work plan.

21.3.2 Strategies That Strengthen Commitment for Behavior Change

The timing of the switch from strategies that enhance or build motivation to return to work to strategies that elicit and strengthen a commitment for return to work is important. If the counselor switches strategies too early, then the client is likely to evidence resistance and progression to the action stage will be hindered. Fitting the motivational strategy to the client, based on the stage of change, is important to effective motivational enhancement. Six strategies that strengthen commitment to behavior change are listed in Table 21.3 and include the following: review the consequences of getting back to work, give advice, communicate free choice, develop a change plan, summarize, and ask for a commitment.

21.3.2.1 Review Consequences of Getting Back to Work

One effective way to strengthen commitment to return to work is to review with the client the consequences of returning to work versus not returning to work. Most likely, the client will realize that the status quo (unemployment) has a number of significant costs. Such a life is unsatisfactory for many clients. An approach that elicits consequences of change is to ask the client to review both the pros and cons of return to work. More likely than not, much information about this would have already been reviewed earlier in the encounter or in previous encounters when self-motivational statements were elicited and discussed in detail with the client. Clients may choose to list in two columns on a piece of paper the benefits and costs (or pros and cons) of different options. Such lists, as long as the contents are generated by clients and not "fed" to them by the counselor and assuming that the benefits of getting back to work outweigh the costs, should help strengthen the client's motivation to develop or maintain a return to work plan.

For example, having gainful employment should result in a number of positive outcomes for the client, such as increased financial

Table 21.3 Six strategies that strengthen commitment to return to work

Strategy	Purposes	Examples
Review consequences of change	Reminds client that returning to work has pros and cons. Allows client to remind himself or herself of the reasons for getting back to work	"What do you think will happen if you were to return to work?" "What are some of the benefits of getting back to work?" "What are some of the costs of getting back to work?"
Give advice	Provides options. Influences action	"I think you should… Does this make sense to you in your situation?" "Here are some options I think you should consider…. Which of these makes the most sense to you?"
Communicate free choice	Emphasizes that it is the client's responsibility to decide on a plan. Encourages client responsibility	"How would you like to proceed?" "There are several ways we could go here… What do you think?"
Develop a return to work plan	Clarifies goals and change strategy. Fosters commitment to change. Consider using the return to work plan. Worksheet (Fig. 21.1)	"What, exactly, would you like to at this point?"
Summarize	Allows clients to hear self-motivational statements again. Allows clients to hear and reaffirm return to work plan	"Your major goals with this plan are to…and this will allow you to… Do I have that right?" "Let's review your plan to be sure I understand what you intend to do."
Ask for a commitment	Clarifies client's intent. Clarifies what client is planning to do	"Are you ready to commit yourself to doing this?"

resources, more self-esteem, and a sense of productivity. On the other hand, return to work might lead to return to a setting or situation that is stressful for the client (e.g., to work with a supervisor that he or she does not get along with). Both the positive and negative consequences of a successful return to work plan should be acknowledged and discussed. However, as much as possible, discussions about the current and future *benefits* of return to work should be emphasized and reiterated in order to enhance motivation prior to the development of a specific return to work plan.

21.3.2.2 Give Advice

As injured workers reach the preparation stage, they may ask for specific information and advice concerning how to proceed. One way to respond is to provide information based on personal experience or research and then ask a follow-up question concerning what the client wishes to do. Whenever possible, offer a number of possible suggestions (a "menu"; see below) from which the client might choose. This helps emphasize that it is the client's responsibility to decide what specifically to do.

Giving advice can help increase motivation. However, some resistance to giving advice on the counselor's part may help to ensure that the client is interested in hearing what is being suggested and not seeking to hear information that he or she can argue with. For example, a counselor might say, "I can tell you what I think might be best in your situation based on my experience with people like you. However, I also believe that each person is different and that what is best for one person may not necessarily be best for another. That is why any decision about what you will do has to be up to you. I am here to support you in the development of a plan that *you* are interested in pursuing."

If the client expresses the desire to know what you think might be best for him or her, especially after you communicate some resistance to providing advice, then short and clear advice statements are best (e.g., "I think you should visit three possible work sites in the next week" or "I think you should research this training opportunity and meet with me next week to tell me what you learned."). In general, it is always a good idea to follow up any information and advice with questions that gauge the client's response (e.g., “Does this make sense to you?” or “Do you have any questions about what I said?”). Such questions help to emphasize that it is the client’s responsibility to make a final decision as to what he or she is going to do next.

21.3.2.3 Communicate Free Choice

In order to maximize self-motivation and to facilitate the attribution of control to the client, the counselor should provide frequent reminders of the client’s free choice in all aspects of his or her change plan. This can be difficult of the treatment options that are very limited and highly proscribed. For example, some clients may only have one option available to them, which they need to either take or leave—and if they choose to not take the option or participate in the offered treatment, their benefits will be discontinued. For such situations, it is important to communicate the rationale (or at least the laws and/or regulations) behind the limitations. The client’s choice then becomes to participate or not participate based on the established rules or requirements. However, to maximize motivation, it is important to provide as many options for the client as possible. Only offering a single standardized return to work plan for all clients would limit success.

21.3.2.4 Develop a Return to Work Plan

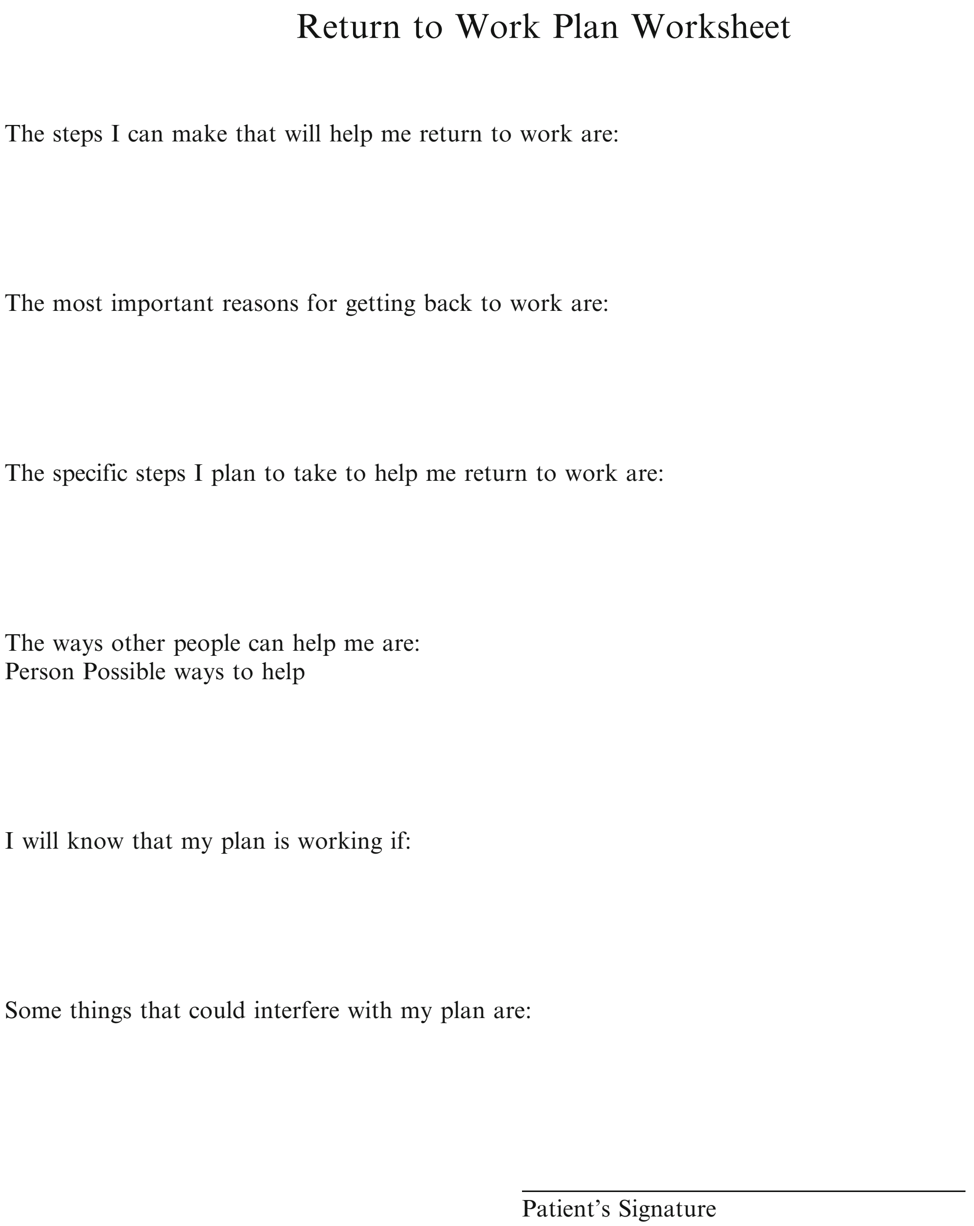
A primary goal of working with a client in the preparation stage is to develop a return to work plan to which client can commit. Readiness to develop a plan may be initiated by the client (e.g., “I’d like to get started on those ideas we have been discussing.”). It can also be effective for counselors to raise the issue of plan development.

One useful strategy to assist in the development of a plan for change is to utilize a return to work plan worksheet (RWPW). This sheet can provide a structure for organizing the most important aspects of the client’s goals and reasons for getting back to work. It also provides the structure that may be used to develop a return to work plan. The six questions addressed on the RTPW are presented in Fig. 21.1.

“*The steps I can make that will help me return to work are…*” Clear goals are important to effective return to work plans. The client should identify which goals are important. However, among clients with a work injury, it is wise to avoid listing “complete healing from the injury” (e.g., “no pain”) as a *primary goal* for several reasons. Although some clients identify this as a primary goal early on in the plan development process, few adaptive behaviors that are in the client’s control have been shown to have a profound influence on “healing” in the short run. The more goals the client identifies where he or she has some direct control (e.g., research, meeting with potential employers), the greater the chance for success.

“*The most important reasons for getting back to work are…*” Here is where the counselor or the client can list the client’s review of the pros and cons of getting back to work vs. staying unemployed. Emphasize the reasons for return to work deemed most important to the client. For example, some clients may want to return to work in order to simply not be bored. Others may need to return to work in order to be able to provide for their families. Still others may be most motivated by a desire to feel like they are making a positive contribution to society. Identifying, discussing, and documenting how participating in a return to work plan will make it more possible that the client’s own goals will be met will help enhance motivation.

“*The specific steps I plan to take to help me return to work are…*” Under this heading, the ideas the client has for making achieving employment can be listed. Ideas initiated by the counselor may be included if the client has endorsed these as his or her own. The more specific these plans can be, the more helpful this section of the RWPW will be to the client. For example, stating, “I will visit three potential work sites this week” is better than “I will try and see what kinds of jobs might be available to me.” “I will participate in a physical therapy program to increase the strength in my back three times a week in the next week” is better than “I will try and exercise more.”



Return to Work Plan Worksheet

The steps I can make that will help me return to work are:

The most important reasons for getting back to work are:

The specific steps I plan to take to help me return to work are:

The ways other people can help me are:
Person Possible ways to help

I will know that my plan is working if:

Some things that could interfere with my plan are:

Patient's Signature

Fig. 21.1 Change plan worksheet. Adapted from Miller and Rollnick (2002). Reprinted by permission of the publisher

"*The ways other people can help me are…*" Many vocational counselors and other RTW professionals understand the importance of other people's responses to the client as influencing client functioning (Fordyce 1976). Discussing with the client and someone close to the client like a spouse, if available, specific steps that the other person can take to assist the client in getting back to work should increase the chances that such changes will actually occur.

"*I will know if my plan is working if…*" Because doing all that is necessary to get back to work can be challenging, it is important to identify signposts that indicate that the client is going in the right direction. Such signposts can act as potential reinforcers for the efforts made, even if the final goal has not yet been reached. Some goals, for example, active physical therapy in an injured worker with a chronic pain problem, tend to result in *increased* pain and discomfort prior to the client feeling stronger. To the extent that such increase can be predicted and even identified as a sign of progress (i.e., “Increased pain means that the muscles that need to be stronger are being challenged”), then the client may be reassured rather than frightened. Specific signs of progress (“Able to lift a 15-pound bag and carry it 20 yards,” “Able to drive for 15 minutes”) towards the final goal (“Able to deliver automobile parts”) should also be included here.

“*Some things that could interfere with my plan are…*” To the extent that client can identify specific problems they may encounter and come up with plans for addressing these problems, then specific hurdles may be avoided altogether or at least more easily dealt with.

21.3.2.5 Summarize

It is as important to summarize when strengthening a commitment to a return to work plan as it was when building motivation to develop that plan. Clients get to hear, yet again, their reasons for participating in their plan. The RWPW used by the counselor to keep track of the issues raised by the client may be used as a guide when summarizing. Changes offered by the client during this summary should be incorporated into the RWPW. The client should get a copy of the RWPW, and one should be included in his or her record.

21.3.2.6 Ask for a Commitment

The final strategy to employ with clients when strengthening a commitment for behavior change is to ask them to commit to the plan they have outlined. Miller at al. (1992) lists several issues worth exploring when obtaining a commitment. First, it is important to clarify what exactly the client intends to do. This is a good time to review the RWPW, beginning with the responses to “The specific steps I plan to take to help me return to work are…” stem. Are the steps, as listed, actually what the client intends to do? The other components of the RWPW should also be reviewed at this time, including perceptions of the benefits of change and the costs of inaction and concerns about what might interfere with making the plan and how to deal with these obstacles. Following this review, simply ask the client for a commitment to follow through with his or her plan: “Are you ready to commit yourself to this plan?” If so, then you can ask the client to sign the RWPW, give the client a copy, and retain a copy for the client’s records.

If the client is noncommittal to a plan of action at this time, then the counselor should ask the client what he or she would like to do from here. Any pressure to “go ahead and try” some aspects of the plan (from the counselor) should be avoided. The client may wish to think about the plan until the next visit or session. No client should feel pushed into making a decision about the plan prior to his or her expression of commitment; if pushed, this would likely result in more, rather than less, resistance to the plan in the long run.

21.3.3 Summary of Strategies That Strengthen a Commitment for Behavior Change

The strategies above are recommended for clients in the preparation or action stages of return to work. The primary purpose of these strategies is to develop a return to work plan and obtain a commitment to this plan. The key strategies are review consequences for following through with the plan, provide information and advice as requested, communicate free choice, assist the client to develop the plan as needed, summarize, and ask for a commitment. At this point, the client should have a plan to make one or more specific behavior changes identified as important for ultimately returning work and should have expressed commitment to follow through on the plan. At the next encounter, interactions with the client involve following up on the client’s efforts.

21.3.4 Follow-Through Strategies

Based on the premise that the most difficult obstacle to making adaptive behavior changes, such as returning to work, involves lack of motivation and not a lack of information or skills, the first phases of motivational strategies might be considered the most difficult and challenging for the vocational counselor. Once motivation for return to work has been elicited and nurtured and that motivation has been shaped into a clear return to work plan and commitment to that plan, adaptive changes are more likely to occur. Follow-up and follow-through consists of only three basic strategies: reviewing progress, renewing motivation (if needed), and renewing commitment (if needed).

21.3.4.1 Reviewing Progress

In a follow-up session, first review the completed steps, if any, since the last encounter. Review the previous specific commitment, plans, and progress. Any and all approximations at progress should be praised. Although the occasional client might appear annoyed with praise (making it necessary for the counselor to provide alternative creative reinforcers), most people appreciate acknowledgment of and praise for their efforts. It is appropriate to express such praise in as dramatic a way and for as long as the client and the encounter will tolerate.

21.3.4.2 Renew Motivation

An assessment of motivation to maintain progress in the return to work plan may include a review of the behavioral indications of motivation (as reflected in what the client has done since the last encounter), as well as the client's responses to questions concerning reasons for getting back to work. Any indications of a decrease in motivation can be met with the five strategies that enhance motivation (e.g., asking open-ended questions, listening reflectively, affirming the client, summarizing, eliciting self-motivational statements).

21.3.4.3 Renew Commitment

Finally, the strategies used to strengthen a commitment for return to work (e.g., reviewing the consequences of return to work, giving advice, communicating free choice, developing a return to work plan) may be used to refine the RWPW (if needed) and obtain a commitment to follow through on the new plan.

21.4 Problems with Motivational Strategies

21.4.1 Motivational Strategies Are Not for Everyone

Some counselors and other RTW professionals are not comfortable with the basic approach of motivational strategies of encouraging client choice and control over their return to work plan. Some counselors may not want to devote the time during encounters (which can sometimes be very time limited) to eliciting client concerns and providing options and choices. For these counselors, the strategies introduced in this chapter may be perceived as inefficient (Miller and Rollnick 2002). Also, some clients may not want to be given choices and responsibility. These counselors and clients may simply feel more comfortable with the more traditional counselor–client roles that require the counselor to provide specific recommendations and expect the client to follow through with those recommendations. Expecting all counselors and clients to want to participate in the type of interactions described here is antithetical to the philosophy of the motivational approach.

21.4.2 What If Motivational Strategies Do Not Work?

Some counselors may feel very comfortable with motivational strategies and may in fact already be using them to a large extent. Whether using these strategies for the first time or the thousandth time, they will not be effective for all clients in all situations. Most counselors have worked with clients who seem to be very comfortable maintaining unemployment. Some clients may appear motivated by what they say, but show resistance through their (lack of) action. Such clients may become so annoyed with these motivational strategies and the lack of provision of what they see as more appropriate treatment(s) that they refuse to make or keep appointments. With such clients, it is still possible to plant a seed of adaptive responding, even if only during a single encounter. For example, a counselor might say:

> In the little time we have had to get to know each other, I hope you understand that I respect your right to make all decisions about how you will handle this problem. I hear you saying that you are convinced that you will never be able to return to work until the symptoms from your injury have completely resolved, or at least improved to an extent that they no longer bother you. If at some time in the future you become interested in considering developing a return to work plan, I want you to know that we are here to help you do that.

21.4.3 What Behavior Changes, Specifically, Should Be Encouraged?

A third problem concerning the application of motivational strategies to any complex problem is the lack of controlled research specifying the relative importance of different approaches. The motivational counselor attempts to move clients away from behaviors and response that may facilitate the status quo and towards behaviors and responses that he or she thinks will facilitate return to work. Although little controversy exists regarding the need to change most of the problem behaviors to which motivational strategies have already been applied (e.g., smoking, drinking problem, heroin abuse, or HIV risk behaviors), there remains little clear research regarding the specific behaviors that are most essential for return to work. Thus, counselors do not always know which specific behaviors to discourage and which behaviors to encourage for a particular client.

One reasonable approach to address this problem is to use motivational strategies to encourage behaviors that (1) are helpful for most clients (in the experience of the counselor and/or based on the most recent research) and (2) the client has not yet tried. Then, as the client tries the new behavior or response, the counselor and client can together monitor progress towards the client's goals to determine how helpful the behaviors are.

21.5 Conclusion

The purpose of this chapter was to introduce vocational counselors and other RTW professionals working with injured workers to the motivational strategies outlined by Miller and his colleagues (Miller and the US National Institute on Alcohol Abuse and Alcoholism 1992; Miller and Rollnick 2002). Although these strategies have been applied to motivate individuals to change a number of specific problem behaviors, such as excessive drinking, they appear to translate well to helping motivate clients to return to work, given the strong role that client motivation plays in finding employment. While the effectiveness of these strategies for helping injured workers has not yet been tested in a definitive clinical trial, preliminary support for their effectiveness for their efficacy is encouraging (see Schultz et al. 2008). Given these findings, as well as the consistent support for motivational approaches for producing behavioral changes in other areas (see Miller and Rollnick 2002), vocational counselors and RTW professionals are recommended to apply these strategies with their clients and determine for themselves the overall helpfulness and utility.

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Economic Perspectives on Return to Work Interventions

22

Emile Tompa, Allard van der Beek,
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22.1 Introduction

Organizations, whether public or private, regularly face challenging resource allocation decisions in their effort to get the most out of the resources they have available for their operations. At a broader, societal level, consideration of the resource implications of alternatives is equally as critical, since not all possibilities can be supported. Consequently, complete information on the costs and consequences of alternatives can be critical to the decision-making process. This is as true in the realm of occupational health and safety (OHS) and return to work (RTW) as it is for other areas of an organization's activities.

The resource implications of alternatives are only part of the information considered in the decision-making process. Even if an effective intervention does not bring financial returns relative to alternative considerations, it still may be a good decision to go forward with it for a variety of reasons. At the organizational level, doing a good job of OHS and RTW is regarded as a critical part of business and is a key workplace benefit in its own right. At the societal level, precedence and priorities may be important factors considered in allocation decisions. Nonetheless, complete information on the costs and consequences of an intervention compared to the status quo or other effective alternatives is still an invaluable input into the decision of which alternative to select.

In this chapter, we focus on economic considerations–both methods and evidence—related to disability management and RTW. Some might say that it is imperative to consider economic matters in the area of disability management and RTW—at the individual, organizational, and societal level—since it is not possible to invest in all interventions that are proven effective. In the short term, consideration of the resource implications of alternatives helps get the most out of expenditures by identifying the most cost-effective interventions. In the long run, it can help achieve the highest level of labor market engagement of working age adults by identifying those interventions with the greatest value. Essentially, economic analysis provides invaluable

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information for short- and long-term decision-making at the local and national levels, for workers, employers, insurers, services providers, and society as a whole.

Undertaking economic evaluations of RTW interventions can be a challenge for a number of reasons: the policy arena of disability compensation, RTW, and labor legislation are complex, having multiple stakeholders and sometimes conflicting incentives and priorities. There are substantial differences in the perceptions of health risks associated with work experiences among the various stakeholders, in addition to a lack of consensus about what should be counted as a benefit or cost of intervening or not intervening. Moreover, there are multiple providers of indemnity and medical care coverage making it difficult to capture the full cost of work disability and the benefits of its prevention. Lastly there are industry-specific human resource practices (e.g., hiring of temporary workers and contracting out services) that can make it difficult to identify the full extent of the burden.

Often the awareness of the need to entertain a change in policy, program, or practice in disability prevention and RTW arises through tracking the burden of work disability. Burden tracking may be informal, such as monitoring disability days at the organizational level, or formalized in a societal-level burden of disease/disability study. The latter is a study that measures the total loss of healthy time (i.e., morbidity and mortality) from a particular health condition (or work disability in general), the costs of treating individuals with the condition, and the impact of the condition in terms of undesirable consequences such as lost productivity to society.

Though burden studies do not measure the probability of success of alternative options or the opportunity costs of interventions that might be undertaken to reduce the burden, these types of studies serve an important information role. They provide insights into the magnitudes of the health and productivity loss and their costs to society. This information can be used to assess how the burden may have changed over time or how a burden from a particular health condition compares to other burdens. It can also help policy decision-makers with priority setting. Burdens that appear particularly onerous may bring attention to the need to (1) increase funding for intervention options known to reduce the burden, (2) evaluate the merits (in terms of health resource implications) of burden reduction resulting from known alternatives that have not yet been evaluated, and (3) invest in research to discover options to reduce the burden in cases where no new alternatives currently exist.

Burden estimates are typically reported for a specific calendar year and are based on costs in that year for all individuals diagnosed with or living with a particular condition. These aggregate costs are also referred to as prevalence costs, because they encompass costs for individuals across the work disability trajectory, including new cases and those with long-term disabilities. Burden studies can also cost incidents longitudinally, starting from onset, and only include new cases. The time period for these longitudinal or incidence cost studies ranges from several months to the individual's lifetime. These two general types of burden studies are not directly comparable, because of differences in the time periods measured and individuals included.

In what follows, we describe the extent of the burden of work disability and then turn to economic evaluations of interventions to reduce the burden. We present an overview of methods and issues in the economic evaluation of disability management and RTW interventions and summarize evidence on the financial merits of such interventions. We end with a discussion and summary of the role of economics in intervention evaluation and investment decision-making, with a focus on disability management and RTW.

22.2 The Burden of Work Disability

The measurement of burdens from health conditions and related disability generally focuses on financial metrics. But burdens can also be depicted with nonfinancial data such as the number of cases in a population, the severity of cases, and, for work disability, the number of individuals absent from work/unemployed, out of the labor force, or receiving disability benefits. Prevalence information on different categories of disability provides a first-level approximation of burdens across countries, but comparability can be an issue because surveys and administrative data used to estimate these statistics may be reporting on slightly different phenomena in different countries. For example, countries may use different questions to inquire about health and function. Furthermore, differences in cultural norms and other contextual factors may also influence perceptions and reporting even if similar questions are used. Program eligibility may also vary, and different types of services may be provided to support RTW. Below we provide statistics on the burden of disability across several developed countries, presenting data on both nonfinancial and financial metrics.

On average, approximately 14 % of individuals report a chronic health condition or a disability across the Organisation for Economic Co-operation and Development (OECD) countries, suggesting that disability in OECD countries is a relatively common phenomenon (OECD 2010a). The exact percentage varies from country to country, ranging from upwards of 20 % in Estonia to just over 5 % in Korea. These numbers are for disability in any social role. A focus on work disability, or nonparticipation in the paid workforce due to health, would likely produce slightly lower percentages since some individuals with health conditions may be employed as a result of accommodation by employers.

One approach to estimating the prevalence of work disability is to identify the unemployment rates of people with disability. Generally, unemployment rates in this group are twice as high as for able-bodied individuals—14 % on average in OECD countries compared to 7 % for the nondisabled (OECD 2010a). Unemployment rates do not include individuals who have given up seeking work or who have exited the labor force entirely. This issue can be addressed by comparing the employment rates of disabled people as a percentage of all disabled working age adults to the employment rates of their able-bodied counterparts. Across 27 OECD countries, employment rates for the disabled average approximately 44 % compared to 75 % for people without disabilities (data is for late 2000s, i.e., just prior to downturn in the global economy) (OECD 2010a). What is not captured in these numbers is the level and type of engagement in paid work. Some employed individuals may be underemployed, both in terms of hours worked and in the match between skill level and job challenges. The disabled are significantly more likely to be underemployed, i.e., working part-time, than nondisabled employed individuals.

Another measure associated with the burden of work disability is the number of individuals receiving disability benefits. Counts of the number or proportion of individuals who receive benefits are generally developed from administrative data sources from disability compensation programs. Given this fact, statistics of this sort are not entirely comparable from country to country due to differences in program offerings and eligibility. Nonetheless, data on disability benefit recipiency can be invaluable to understanding disability program burdens.

In 2007, the overall disability recipiency rates in OECD countries were 6 %, with high rates in Hungary, Norway, and Sweden (approximately 10 %) and low rates in the non-English-speaking OECD countries of Japan, Korea, and Mexico (below 2 %) (OECD 2010a). Countries with more universal programs had higher rates. In northern European countries, where eligibility is extensive, rates are between 8 and 11 %. In Anglo-Saxon countries, where eligibility is more limited, rates are in the 5–7 % range. In the Netherlands, benefit recipiency was quite high in the 1990s, before the introduction of reforms to reduce the use of the program as a substitute for unemployment or a transition to retirement. The Dutch experience with these reforms is described in de Jong and de Vos (2005) and de Vos et al. (2010). In general, disability benefit recipiency rates are generally much higher for older workers and even more so in countries where it serves as a transition to retirement. On average, more than half of disability benefits recipients are men, though in Nordic countries the majority are women (OECD 2010a).

As noted, data on recipiency rates fail to account for the fact that many disabled individuals do not receive disability benefits. In fact, only a minority receive benefits. On average it is 25 %, with the proportion as low as 10–15 % in Portugal and Germany and as high as 33 % in Norway, Poland, and the United States (OECD 2010a). Higher rates do not necessarily imply higher incomes, since generosity of benefits varies from country to country. Furthermore, some disabled individuals may also receive other types of benefits, such as unemployment insurance. The proportion not receiving any benefits is 10–25 % on average but as high as 50 % for some English-speaking and Mediterranean countries (specifically Canada, the United States, Spain, Greece) (OECD 2010a). Some of these disabled individuals not receiving any benefits may be employed. Between 10 and 20 % of the disabled populations from these four countries have no public pension or labor market income. For most OECD countries, the proportion of no pension or labor market income is less than 10 %.

Several comprehensive disability burden studies have been developed by Leigh and colleagues for various levels of the US economy that identify a monetary value of the burden of work injury and illness (Leigh 2011; Leigh et al. 1997, 2000, 2001, 2003, 2004). We focus on the most recent one, which estimated the burden for occupational injury and illness for the United States in 2007 (Leigh 2011). The study considers both direct and indirect costs. Direct costs refer to medical expenses and insurance administration expenses (the latter does not include benefit expenses). Indirect costs refer to output losses consisting of lost earnings, fringe benefits, and home production. The human capital approach is used to estimate output losses. The incidence-based approach is applied, where the burden is based on lifetime costs of new cases arising in the calendar year. The study identified a total burden of $246 billion (in 2007 US dollars). Table 22.1 provides details.

The total cost burden for the United States was $249.63 billion in 2007, with work disability costs (indirect costs) from both nonfatal injuries and illnesses amounting to $182.54 billion (approximately 70 % of the total). The estimated

Table 22.1 Total cost of occupational injuries and illnesses in the United States in 2007 (Adapted from Leigh 2011)

8.559 M nonfatal injuries 5600 fatal injuries		Billions of dollars ($)		Cost per incident ($)
Direct costs for injuries	Medical costs for nonfatal injuries	45.95	–	5,369
	Medical costs for fatal injuries	0.31	–	55,357
	Total medical costs for injuries	–	46.26	–
Indirect costs for injuries	Indirect costs for nonfatal injuries	139.89	–	16,344
	Indirect costs for fatal injuries	5.68	–	1,014,286
	Total indirect costs for injuries	–	145.56	–
0.427 M nonfatal illnesses 53,000 fatal illnesses		Billions of dollars		Cost per incident
Direct costs	Medical costs for nonfatal illnesses	3.17	–	7,424
	Medical costs for fatal illnesses	17.66	–	333,208
	Total medical costs for illnesses	–	20.83	–
Indirect costs	Indirect costs for nonfatal illnesses	9.09	–	21,288
	Indirect costs for fatal illnesses	27.89	–	526,226
	Total indirect costs for illnesses	–	36.98	–
Overall total			249.63	

burden likely underestimates the true value because it does not include the value of pain, suffering, and loss of enjoyment of life or homecare provided by family members. The author notes that this burden is at least as large as that of cancer. Noteworthy is the fact that workers' compensation covers less than 25 % of this burden.

In Canada, the direct cost of occupational injuries and illnesses exceeded $6 billion per year in 2001 (Tompa 2002). This estimate includes insurance administration expenses and medical services that are paid by employers through workers' compensation premiums. The indirect cost estimate for Canada is $12 billion. This number includes costs incurred by employers to accommodate injured workers who return to work, recruitment and training costs incurred for replacing injured workers, earnings lost by workers due to injury, and the lost home productivity of workers. As with Leigh (2011), the estimated burden is likely an underestimate of the true value, since it does not include costs associated with pain, suffering, and loss of enjoyment of life or home care provided by family members. Furthermore, the Canadian estimate is based on claim counts and does not address underreporting as does the Leigh estimate (2011). Underreporting is well documented in the literature and is an issue that needs to be addressed if accurate estimates of burdens are to be calculated since the magnitude of underreporting can be substantial. Shannon and Lowe (2002) found that as much as 57 % of work-related injuries are not reported.

A series of reports entitled "Economic Burden of Illness in Canada" (EBIC) were produced by the Canadian federal government to provide objective and comparable data on the burden of illness and injury in terms of both direct (health care) and indirect (output and productivity losses) costs (EBIC 1989, 1996, 1998). The most recently released report is from 1998 (EBIC 1998). It estimates that the direct and indirect cost from all health conditions for Canada in the calendar year 1998 was $159 billion or 9.9 % of GDP. The study uses a prevalence approach and considers both morbidity and mortality. Direct costs in the study include medical care and rehabilitation costs, which amount to $84 billion or 5.2 % of GDP. Indirect costs include lost earnings and home production, which amount to $76 billion or 4.7 % of GDP. Table 22.2 provides details on the direct and indirect costs estimated in this study. Overall, the estimated burden is large and likely underestimates the true value, since it only accounts for a few categories of costs.

Table 22.2 Indirect costs of injury and illness in Canada for 1998 (Adapted from EBIC 1998)

	Billions of dollars ($)		Percentage of GDP (%)	
Direct costs				
Hospital care expenditures	27.64	–	1.72	–
Drug expenditures	12.39	–	0.77	–
Physician care expenditures	11.69	–	0.73	–
Expenditures for care in other institutions	8.05	–	0.50	–
Total direct costs	–	83.95	–	5.23
Indirect costs associated with short-term disability				
Lost earnings	3.90	–	0.24	–
Lost home production	5.90	–	0.37	–
Total short-term disability indirect costs	–	9.80	–	0.61
Indirect costs associated with long-term disability				
Lost earnings	13.00	–	0.81	–
Lost home production	19.20	–	1.20	–
Total long-term disability indirect costs	–	32.20	–	2.01
Indirect costs associated with premature mortality				
Lost earnings	13.50	–	0.84	–
Lost home production	20.00	–	1.25	–
Total premature mortality indirect costs	–	33.50	–	2.09
Total direct and indirect costs		159.45		9.93

22.3 Methods and Issues in the Economic Evaluation of RTW Interventions

In this section, we review economic evaluation methods with a view to their application in evaluating the resource implications of RTW interventions. Underlying the quantification and aggregate of costs and consequences experienced by different stakeholders is an implicit notion of social welfare. Economists have tried to identify a set of principles by which to measure and aggregate components of costs and consequences, while minimizing the number of controversial assumptions imbedded in the methodology. The area within economics where this methodology has been developed is known as welfare economics. It is the root of the economic evaluation approach known as cost-benefit analysis (CBA).

Welfare economics is focused on an abstract concept of individual valuation, known as utility, to identify the relative values placed on alternatives by individuals. Within the welfarist paradigm, utility is not comparable between individuals. This lack of comparability seriously restricts the ability to evaluate the merits of alternative health interventions because, in principle, no individual can be made worse off by a program. Essentially, the loss of one individual cannot be directly compared to the gain of another. The standard welfare economics criterion that helps circumvent this comparability issues is known as the "potential Pareto improvement criterion." This criterion requires ensuring that gainers can compensate the losers, either in theory or practice, so that no one is made worse off. An outcome where there are some gainers and no net losers (after real or theoretical compensation) is considered an unambiguous gain in social welfare. This condition is met if the monetary value of consequences exceeds the cost of the intervention (i.e., net present value of an intervention is positive).

Because welfare economics limits the set of efficiency enhancing choices that can be made due to restrictions in the comparisons allowed, economists have developed an alternative approach known as the social decision-maker approach. It is based on the notion that a benevolent decision-maker (or policymaker) can make direct comparisons of values across individuals, in order to allow for a larger number of alternatives to be compared. This paradigm is often labeled extra-welfarist because it entails the inclusion of a broader set of considerations in the measurement process (Culyer 1991). In the context of health interventions, interperson comparisons of health gains are made in order to compare alternative health interventions. Rather than maximizing social welfare, health becomes the maximand in the extra-welfarist paradigm. This paradigm is the root of the health measure known as a quality-adjusted life year (QALY) and economic evaluation methods known as cost-effectiveness and cost-utility analysis (CEA, CUA).

Monetary measures of values are generally taken from market prices, but can also be identified through nonmarket approaches such as surveys (e.g., through willingness to pay/receive studies). These nonmarket approaches are particularly relevant for measuring values that are not identified in the market or are not accurately identified. Nonmarket approaches to measuring value are most relevant for health. In some studies, health is measured in natural units specific to the intervention under consideration (e.g., disability days averted) and is kept in this form for intervention evaluation purposes. In other studies, health is measured in QALYs, which is a measure that incorporates both quality and quantity. The three ways of measuring health—in financial terms, natural units, and quality-adjusted units—are associated with three types of economic evaluations, namely, CBA, CEA, and CUA. All three use a monetary metric for the cost of intervention alternatives. It is only the metric used to capture health consequences that differs. Below we review specific approaches to measuring the value of health that are used in CBA, CEA, and CUA.

22.3.1 CBA and Monetary Measures of Health

22.3.1.1 Willingness to Pay

Willingness to pay (WTP) uses monetary units for measuring health and related consequences of an intervention (Drummond et al. 2005; Tompa et al. 2008c). This method is also called *contingent/stated valuation* because individuals are asked directly about the values they ascribe to alternatives. This approach is common in environmental assessments, but has also been used in the health technology assessment field. WTP identifies the maximum amount an individual would be willing to pay for a health improvement. If the sum of WTP of all affected individuals exceeds the costs of implementing an alternative, then the intervention is deemed to be worth undertaking. In such a case, net losers (i.e., those who pay more for the program than the value of it to them) could theoretically be fully compensated for their losses by those who are net gainers, and some gainers would still be better off. Applied to the disability context, WTP questionnaires can be used to value interventions to improve RTW outcomes in monetary terms.

The key shortcoming of WTP measures is that they are sensitive to the ability to pay. Thus, programs benefiting those with more disposable income may be given priority over programs benefiting those of more modest means. Other concerns include whose preferences to elicit and how broadly or narrowly to cast the questions about the value of consequences. A broad question would inquire about the willingness to pay for all consequences. A more restricted WTP approach might focus only on valuing health consequences through a questionnaire, which would then require capturing non-health consequences separately through other means (e.g., by using market prices).

22.3.1.2 Compensating Wage Differentials

Compensating wage differentials are an alternative means to valuing health consequences in monetary terms (Dorman 1996; Dorman and Hagstrom 1998; Viscusi 1993). This method is also called *revealed preferences* because values are identified through the choices people make in the market rather than through direct elicitation (e.g., through the choice of a job with known health risks in exchange for higher pay). Revealed preferences generally include all the known consequences arising from health risks taken, as well as other undesirable aspects of a chosen situation that may be unrelated to health, such as the griminess of a job. Identifying compensating wage differentials requires data on different occupations, their wages, and the health risk associated with them in order to statistically estimate wage-health risk trade-offs. Information extracted from the data is used to identify the statistical value of a human life, life year, or health loss due to a health condition.

The revealed preference approach is not often used in economic evaluations for several reasons. First, developing measures for various health conditions requires identifying revealed preference situations with particular health risks and then collecting and analyzing data from them. Values for a full complement of health risks would be difficult to determine due to the absence of data and opportunities to collect them. Most studies to date have focused on the risk of death in an occupational context rather than the risk of morbidity, whereas morbidity is an important aspect of work disability. A second shortcoming is that health risk values found in different studies have been inconsistent. Third, it is difficult to know the full range of features of different jobs that bear on the wage differentials identified. They may be due to undesirable features other than health risk, such as the griminess of a particular occupation. Lastly, there may be factors present that bias the health risk values identified through revealed preferences, such as lack of information on the part of workers about the health risks of different occupations, and power imbalances between workers and employers.

22.3.1.3 Human Capital

Another monetary approach used to value health is known as the human capital approach (Drummond et al. 2005; Tompa et al. 2008c). Underlying this approach is an assumption that the value of health is primarily its human capital for use in productive activities. The focus is often exclusively on output from paid labor force engagement. To estimate the value of lost output, absence time from an occupational role is multiplied by the value of time (its price weight) in that role. The assumption underlying this calculation is that the wage value of time off work due to poor health is a good measure of lost output at the organizational and societal levels, i.e., the person is not replaced in their work role, and that output loss is enduring.

For price weights of occupational time different rates may be used. For workplace interventions, actual salaries are often used, whereas for population studies, average salaries are used. The present value of earnings losses until RTW or retirement is estimated if an absence spans longer than a year. For long duration absences, rather than assume that wages remain constant for the injured/ill worker, one can adjust earnings to reflect the standard lifetime earnings trajectory. For example, if a young adult earns minimum wage and becomes permanently and fully disabled, one could assume some earnings growth over the career that would be based on a counterfactual of what the person would have been earning if they had not been injured.

For individuals not in the paid labor force—youth, students, homemakers, and retirees—it is not clear how best to value their time in poor health. One possibility for nonpaid occupational roles (e.g., home maintenance) is to estimate what it would cost to pay someone to do that task (replacement cost) or what the person would be paid if they were in the paid labor market (see Drummond et al. 2005 for details). The latter is known as a *shadow price*.

Because the human capital approach takes a very narrow view of the value of health, it is not commonly used as the sole measure of health in program evaluation. The exception may be in the occupational health and safety field where intervention studies often take an employer's perspective whose concerns are often focused on maintaining productivity and output (Tompa et al. 2006). Weil (2001) suggests using the human capital approach to measure the value of healthy time in the paid labor force and using another approach (e.g., QALY) to capture the value of healthy time in nonwork roles and the intrinsic value of health.

There are four key concerns regarding the human capital approach. First, wage rates may not accurately reflect the marginal product of a worker due to market imperfections. Second, its focus on occupational output as the only value of health is too narrow by many accounts. Third, in its simplest form (where actual wage values are used) the approach places greater value on the time of individuals with greater earnings and lesser value on the time of individuals with lesser earnings. Fourth, a strong assumption commonly made when using this metric is that societal output losses due to an individual's long-term health condition are enduring. In reality, if a worker is absent for a long time due to a health condition, the person would likely be replaced with a worker who would eventually be equally as productive.

22.3.1.4 Friction Cost Approach

As noted, the estimation of output losses at the organizational and societal levels may be less than the sum of earnings losses of individuals who experience the health condition under consideration, as estimated by the human capital approach. In particular, organizations may replace absent workers with new hires from the ranks of the unemployed. If this is the case, output levels may return to the norm after the new hires receive training and their skill levels increase with time. The friction cost approach assumes that output losses exist only in the short run. This period is known as the friction period. Also assumed is that there is excess unemployment, such that there are a sufficient number of individuals available to take up the position made vacant by the injured/ill. Even if this is the case, the friction period may vary over the business cycle and over time as the unemployment rate varies. If studies use different friction periods for interventions executed in different time periods, comparability between studies can become a challenge.

22.4 CEA, CUA, and Nonmonetary Measures of Health

Measures that fall under the rubric of extra-welfarist use a range of intermediate and final outcome measures to value health consequences (Drummond et al. 2005). These include pain, discomfort, particular symptoms, clinical measures, particular health conditions, and general health status. These measures can be classified as specific or general, that is, specific to a particular health condition or a measure of general health. They may also be categorized as intermediate or final, that is, intermediate proxies for downstream health outcomes or direct measures of end-state health. The choice of measure to use depends on the purpose and context of a study. The term CEA is broadly used to refer to economic evaluations that measure health in natural units. The term CUA is used specifically to refer to evaluations which use health units that capture both the quantity and quality of health.

One of the key concerns with intermediate and final health measures is the limitation on comparability. Only studies using similar measures can be compared. Even when studies use apparently similar measures, they may not be fully comparable due to the use of different measurement protocols, for example, pain being measured using different questionnaires with different scales. General health measures such as the Short Form-36 (SF-36) are more broadly applicable and comparable and have been tested for construct validity and reliability. However, such general health measures may be less responsive to health changes from an intervention than purpose-specific measures, particularly in the short run. Another concern is that non-health consequences need to be captured through other, preferably monetary measures, if they are to be included in an analysis. A third concern is the need for an external yardstick to assess the monetary value of a unit of health outcome. Essentially, the decision-maker will at some point be confronted with the need for information on how much an organization or society is willing to pay for a unit of health as a measure in the evaluation.

An alternative to measuring health in natural units is to use health-related quality of life measures. As noted, such measures combine quantity (i.e., length of time in a health state) and quality (i.e., level of morbidity) of health (Drummond et al. 2005; Gold et al. 1996). These include quality-adjusted life-years (QALYs) and variants such as healthy year equivalents (HYEs), the EuroQOL five dimensions questionnaire (EQ-5D), and disability-adjusted life-years (DALYs) (Drummond et al. 2005; WHO 2011). Preference-based multi-attribute health status classification systems, such as Quality of Well-Being, Health Utility Index (HUI), and EQ-5D, can be used as weights in conjunction with data on the length of time in health state to estimate QALYs.

Within preference elicitation exercises used to identify health-related quality of life measures, questions are generally framed for respondents in terms of the value of health outcomes for themselves. There have been ongoing discussions in the literature about how and where to capture worker time costs (labor market earnings associated with different health states) and aggregate productivity consequences associated with health outcomes when using health-related quality of life measures. Key concerns are to avoid double counting and to ensure all time costs and productivity consequences are accounted for in the analysis. The consensus seems to be to measure them separately in monetary terms.

Several issues arise with the QALYs construct. First, it is assumed that preferences for health outcomes are such that quantity (i.e., survival duration) and quality (i.e., morbidity/quality of life) are separable and divisible, which may not be the case. A second issue is how to weight QALYs when aggregating within and across individuals. The convention has been to weight units equally, regardless of their distribution, though this may not necessarily reflect societal preferences. A third issue is that QALYs only capture the value of health for clients of a program. Not captured are benefits to others, such as family and community. In economics, these are termed health externalities. They are associated with contagious diseases and sentiments, such as altruism and parentalism (e.g., the value one places on good health for others).

Table 22.3 provides a summary of measures used to value health and some of the issues that need to be taken into consideration when interpreting studies using these measures.

22.4.1 Summary Measures and Decision Rules

Choosing between one of the three types of economic evaluations (CBA, CEA, and CUA) should be based on the objective of the intervention and the question being addressed by the study. These in turn are influenced by the nature of the key outcome variable and the relevant perspective(s) to be considered. For example, if a key perspective is that of a private sector firm, CBA might be

Table 22.3 Summary of measures used to value health

Paradigm	Measure	Details	Issues	Implications for RTW program evaluation
Welfarist	Willingness to pay/receive	Monetary value of health states ascribed to alternatives by directly asking individuals about their willingness to pay/receive	– Sensitive to ability to pay/receive – Clarity needed on what to consider in the valuation	– Programs for higher income earners and individuals with more wealth may be given greater value than that for lower income earners or poorer individuals – The quality of an evaluation will depend on how well the alternatives are described to the respondents of the contingent evaluation survey
	Compensating wage differentials	Monetary value of health states identified through actual choices people make	– Includes all consequences arising from health risks taken – Data required to estimate values may not be available – Labor-market imperfections may distort values – Values found in different studies have been inconsistent	– Programs that improve health and labor-market engagement for individuals in the labor force may be given greater value than those for individuals out of the labor force – Programs for higher income earners may be given greater value than those for lower income earners – Some programs may be difficult to evaluate if relevant scenarios are not available from which to collect data – Outcomes other than earnings would not be captured
	Human capital approach	Monetary value of health states determined by multiplying the wage rate by work hours associated with alternatives	– Narrow view of the value of health – Wage rates may not accurately reflect the marginal product of the worker – Strong assumptions regarding long-term societal productivity losses	– Programs that improve health for individuals in the labour force may be given greater value than those for individuals out of the labour force – Programs for higher income earnings may be given greater value than those for lower income earnings – Programs for younger individuals may be given greater value than for older individuals – Outcomes other than earnings would not be captured in the evaluation particularly the value of an individual's good health to family and community
Extra-welfarist	Natural units	Value of health states measured in natural units that reflect immediate and final health outcomes	– Only studies using similar measures can be compared – Generic measures may be less responsive to interventions than purpose-specific measures – Non-health outcomes (e.g., worker time costs, productivity) need to be captured through other measures – Health externalities not considered – Need monetary value of a unit of health outcome to make decisions	– Many aspects of health improvements and their variations may not be captured in the evaluation – Program-specific interventions may make it impossible to compare interventions for different kinds of return to work programs – Earnings, productivity, and other non-health-related outcomes may be considered in the analysis unless explicit efforts made to include them – Value of an individual's good health to family and community will not be captured
	Quality-adjusted life-years	Value of health states measured in health quality-adjusted time units	– Quality and quantity assumed separable and divisible – Underlying axioms violated in practice – Non-health outcomes (e.g., worker time costs, productivity) need to be captured through other measures – Health externalities not considered – Need monetary value of a unit of health outcome to make decisions	– Good health treated would have the same value regardless of recipients and the distribution of gains – Measure may not be sensitive to subtle differences in program effectiveness – Earnings, productivity, and other non-health outcomes may be considered in the analysis unless explicit efforts made to measure them – Value of an individual's good health to family and community will not be captured

preferred if one of the objectives of an intervention is to reduce insurance costs through improved OHS performance. As noted, the three types of evaluations differ primarily in the measurement of the outcome (monetary metric for CBA, natural units for CEA, and utility metric for CUA), and each has its strengths and weaknesses. Including more than one type of evaluation is not uncommon, since each can provide different insights into the merits of an intervention. For example, one could undertake a CEA to better capture the health outcomes that are not readily translatable into a monetary metric (e.g., pain reduction, disability days averted) and a CBA in which health outcomes are proxied through some monetary measure (e.g., willingness to pay, reduced productivity, cost of absences). This is the approach taken by Loisel et al. (2002) in their study (i.e., they undertook both CEA and CBA).

Summary measures for CBA, CEA, and CUA are generally reported as a ratio of the cost per monetary benefit, natural unit, or QALY. Because economic evaluations compare two or more alternatives, the ratios reflect an incremental/marginal cost (relative to a comparator such as the standard program) per incremental/marginal benefit, unit, or QALY (again relative to a comparator). Calculating this ratio can be a challenge, particularly with CEA and CUA. Good guidance on decision rules is provided by Drummond et al. (2005) and Hoch and Dewa (2008). Table 22.4 provides a summary. Because both numerator and denominator in CBA are in monetary units, what values are placed in one versus the other can be inconsistent across studies making ratios across studies difficult to compare. Alternative summary measures used in CBA are net present value and payback period.

22.4.2 Issue of Perspective and Distributive Equity

Most economic evaluations of workplace interventions found in peer-reviewed journals are conducted from the perspective of the firm or company. A focus on the company perspective may be warranted if the firm is the key decision-maker, but omitting consideration of the costs and consequences experienced by other stakeholders may overlook critical costs and consequences. There is a strong normative argument for considering a broad, societal perspective and for considering the distribution of costs and consequences across various stakeholders. Specifically, the fact that there are multiple stakeholders affected by OHS issues (firms, workers and their families, unions, health-care providers, insurers, society) suggests that costs and consequences borne by all the stakeholders ought to be included in the analysis. This is the norm in other economic evaluation contexts where there are multiple stakeholders (e.g., environmental impact assessment). A broad perspective does not preclude providing information on other perspectives. In fact, a disaggregation of costs and consequences would be invaluable as it would provide insight into their distribution.

Economic evaluation is focused on efficiency. Inherent in the methodology is a need to compare and aggregate costs and consequences across individuals and across different stakeholder groups. As a result, there are equity implications of interventions that ought to be explicitly considered in an evaluation. Equity issues are commonly placed under two broad categories—distributive equity and procedural equity. The former refers to the fairness of the allocation of costs and consequences, whereas the latter refers to the fairness of the decision or allocation process. All equity constructs have inherent values embodied in them, so none can be assessed exclusively through scientific principles. Within the broad constructs of distributive and procedural equity, there are many rival notions that have been proposed. A summary of the key ones found in the literature are presented by Culyer and Tompa (2008).

22.4.3 System Design Issues

Although the public sector in most developed countries plays a role in disability compensation and support provision, countries differ

Table 22.4 Types of economic evaluations and related decision rules (Adapted from Drummond et al. 2005 and Hoch and Dewa 2008)

Type of economic evaluation	Comparison being made	Standard decision rule	Summary measure(s)	Example	Issues
CBA	Incremental cost (ΔC) compared to incremental benefit (ΔB)	If $\Delta C < \Delta B$ then intervention is worth undertaking	Cost-benefit ratio; net present value; payback period	Lahiri et al. (2005): for an office ergonomics program consisting of lumbar pads, back rests, and a back school workshop the net savings per year were $70,441 with savings of $111 per worker. The benefit-to-cost ratio was 84.9, and the payback period was 0.5 months (2002 US dollars)	– Difficult to determine what to put in the numerator versus the denominator – Net present value and payback period are more likely to be affected by the scale of the intervention than the cost-benefit ratio—to address this issue, the analysis can be scaled by the relevant units such as claim, case, or worker
CEA	Incremental cost (ΔC) compared to incremental natural unit (ΔE)	If the value of a unit of effect is worth the cost as identified by the cost-effectiveness ratio, then the intervention is worth undertaking, but only if there is money available in the budget	Cost-effectiveness ratio	Loisel et al. (2002): for a disability management intervention consisting of a clinical intervention combined with occupational intervention (Sherbrooke model), at mean 6.4 years follow-up, the relative cost per days of full benefit (DFB) (compared to standard care arm) was −$67.50 per DFB saved for the clinical arm, −$88.40 per DFB saved for the occupational arm, and −$63.50 per DFB saved for the Sherbrooke arm (1991 CDN dollars)	– Studies using different natural units are not easily compared – There is a need to identify a maximum dollar value for a natural unit to be used in a decision rule – Incremental costs and/or incremental effects may be negative relative to the comparator, making it difficult to interpret the finding of an evaluation
CUA	Incremental cost (ΔC) compared to incremental natural unit (ΔE)	If the value of QALY is worth the cost as identified by the cost-utility ratio, then the intervention is worth undertaking, but only if there is money available in the budget	Cost-utility ratio	Kermode et al. (2003): for a Q fever vaccination program, increasing vaccination uptake from 65 to 100 % among meat industry workers resulted in a cost of QALY of $6,294; increasing vaccination uptake from 0 to 20 % among agricultural industry workers resulted in a cost per QALY of $7,984 (2001 AU dollars)	– It is not always clear what is captured in a QALY because there are different ways to estimate a QALY – There is a need to identify a maximum dollar value for a QALY to use in the decision rule – Incremental costs and/or incremental QALYs may be negative relative to the comparator, making it difficult to interpret the finding of an evaluation

substantially in their social security arrangements (e.g., in terms of programs provided to address income security for vulnerable populations such as single mothers, the elderly, the disabled, and the unemployed). These differences are the result of their historical, political, economic, and cultural backgrounds (Hamalainen et al. 2009). They undoubtedly bear on the degree to which vulnerable populations are integrated into the labor market and how new disability management and RTW initiatives are best integrated into existing systems. These system design differences invariably have an impact on the distribution of burdens and the costs and consequences of efforts to alleviate burdens. In turn, efforts to measure burdens and evaluate programs must take into consideration these differences.

For some countries, workers' compensation is the primary program for work injuries and illnesses (e.g., Canada, the United States, Germany, and Australia), with other public and private programs providing supports for nonwork injuries and illnesses. Other countries have a more general disability compensation scheme that does not distinguish among sources of the exposure that gave rise to poor health and disability (e.g., the Netherlands). Some countries also make a distinction between work injury and occupation diseases, with different programs for each (e.g., New Zealand).

Funding for disability schemes may also vary across countries, generally falling into one of two categories: (1) contributory and (2) general tax financed. Furthermore, some jurisdictions allow private, for-profit firms to provide coverage (e.g., the United States), whereas others have only state-run programs. Table 22.5 provides an overview of the characteristics of the work disability systems of several developed countries. A more detailed presentation of several countries' systems is provided in a series of OECD reports published over the last 10 years (see OECD 2006, 2007, 2008, 2009, 2010b for details). Hotopp et al. (2008) also provided a synopsis of several country systems.

22.5 Evidence on the Financial Merits of Return to Work Interventions

Over the last few years, workers' compensation insurers and authorities have increasingly focused on disability management issues and specifically on RTW initiatives. Many of these include a workplace-based component, such as the inclusion of the employer in the RTW transition. Some initiatives have been undertaken directly by employers, though the complexity of disability management programs generally involves the expertise of various specialties from outside the firm. Hence, many such initiatives are undertaken at the system level by a workers' compensation insurance authority or public administrator and provide disability management services to multiple industries. Disability management has been regarded as good practice since it promotes improved recovery time, and evidence suggests that it can lead to lower resource costs (Tompa et al. 2008a). In most cases, workers return to their injury employer, often initially to modified work, while concurrently receiving some kind of medical treatment and rehabilitation services.

Advancements have occurred in evaluating the effectiveness of workplace-based interventions on disability management and RTW, as well as syntheses of evidence on effectiveness. Franche et al. (2005) conducted a systematic review of quantitative research on workplace-based RTW interventions. The authors' primary goal was to review the effectiveness of these interventions. They considered three types of outcomes: work disability duration, associated costs, and quality of life of workers. The latter outcome category included measures of general health, condition-specific functional status, symptom severity, and pain levels. The review found moderate evidence that workplace-based RTW interventions decrease duration of disability and mixed evidence that they have a positive impact on workers' quality of life. MacEachen et al. (2006) undertook a qualitative systematic

Table 22.5 Characteristics of work disability systems in several countries (Adapted from Eeckelaert et al. 2010)

		Work disability policy system characteristics				
Welfare state regime	Country	Distinct work injury/illness system	State run	Monopolistic	Private	Competitive
Liberal: in such regimes, publically provided benefits are often needs tested and modest, designed to serve those that fail in the labor market. Programs are meant to support the pivotal role of private markets	United Kingdom	–	–	–	✓	✓
	Ireland	–	✓	✓	–	–
	Canada	✓	✓	✓	–	–
	Australia[a]	✓	✓	✓	✓	✓
	The United States[a]	✓	✓	✓	✓	✓
Corporatist/Bismarckian: such regimes typically have compulsory state social insurance programs with generous entitlements and benefits dependent on contributions (i.e., requiring individuals to work for eligibility). Benefits are not a social right, rather, there are rules and preconditions that determine eligibility	Germany	–	✓	✓	–	–
	France	–	✓	✓	–	–
	Belgium[b]	✓	✓	✓	✓	✓
	Luxemburg	–	✓	✓	–	–
	Austria	–	✓	✓	–	–
Nordic/social democratic: in this regime, every citizen has entitlement regardless of contributions and prior labor market engagement. Essentially, programs are universal	Sweden	–	✓	✓	–	–
	Denmark[b]	✓	✓	✓	✓	✓
	Finland	–	–	–	✓	✓
Mixed: a hybrid of Nordic and Corporatist regimes	The Netherlands	–	–	–	✓	✓
Mediterranean: this group of southern European countries have in common the important role family networks play in providing welfare	Portugal[b]	✓	✓	✓	✓	✓
	Spain[b]	✓	✓	✓	✓	✓
	Italy	–	✓	✓	–	–
	Greece	–	✓	✓	–	–
	Cyprus	–	✓	✓	–	–
	Malta	–	✓	✓	–	–
Postcommunist: former Soviet Union Socialist Republic states are part of an Eastern European-type regime that have characteristics of various regime types and are best described as hybrid or mixed regimes	Estonia	–	✓	✓	–	–
	Latvia	–	✓	✓	–	–
	Lithuania	–	✓	✓	–	–
	Bulgaria	–	✓	✓	–	–
	Czech Republic	–	✓	✓	–	–
	Hungary	–	✓	✓	–	–
	Poland	–	✓	v	–	–
	Romania	–	✓	✓	–	–
	Slovenia	–	✓	✓	–	–
	Slovak Republic	–	✓	✓	–	–

[a] Three Australian states have state-run monopoly workers' compensation programs with the remainder of the jurisdictions having private competitive insurance markets. In the United States, most states have private competitive insurance markets for workers' compensation insurance, though some states also have state funds and four states have monopolistic state funds

[b] Belgium, Denmark, Portugal, and Spain have private competitive insurance markets for work injuries but monopolistic state provision for some or all occupational illnesses

review of RTW interventions in order to better understand the dimensions, processes, and practices of RTW. The review found that RTW interventions are quite complex in that they involve the beliefs, roles, and perceptions of many players. Goodwill and trust were highlighted as central elements for successful RTW arrangements. Additionally, social and communication barriers often existed in RTW. Intermediary players such as rehabilitation or occupational health-care providers and workplace supervisors could have the potential to help overcome the barriers and facilitate the process.

Less research has been conducted on the resource implications of disability management and RTW interventions; however, this evidence base has grown. A systematic review of intervention studies with economic evaluations found that few intervention studies undertook economic evaluations, and among the few that did, the quality of analysis was mixed (Tompa et al. 2008a). Nonetheless, the review did make a substantive statement on the evidence, based on four high-quality studies (Arnetz et al. 2003; Jensen et al. 2005; Karjalainen et al. 2004; Loisel et al. 2002) and four medium-quality studies (Greenwood et al. 1990; Hochanadel and Conrad 1993; Linton and Bradley 1992; Wiesel et al. 1994).

The eight studies were in five industrial sectors, namely, health care, manufacturing and warehousing, mining and oil and gas extraction, multi-sector, and utilities. The study interventions occurred either in North America (Canada and the Unites States) or in Scandinavia (Finland and Sweden). Table 22.6 provides details.

Seven of the eight studies conducted full economic evaluations (i.e., considered both costs and consequences), with one (Wiesel et al. 1994) undertaking a partial evaluation (i.e., considering only consequences in monetary terms). The majority of these studies employed a cost-benefit analysis, where the costs and consequences (benefits) of the intervention were compared in monetary units. The predominant outcomes of focus in the economic analysis component of the studies were the wage-replacement expenses associated with injury absence (e.g., wage cost of the absence, workers' compensation wage-replacement cost, or disability indemnity costs) and/or health-care expenses associated with the injury. In terms of study perspective taken, one study took a societal perspective, three a system-level perspective, two an employer's perspective, and two were unclear.

The eight studies contained various mixes of intervention components and features listed in the materials and methods' section. Some interventions had an ergonomics component and other education component sometimes provided through a back school, and some included physiotherapy, some included behavioral therapy and others vocational work/rehabilitation. The interventions covered a range of features, though none included all the features considered. Most had two or more, and two had only one feature. Table 22.7 provides details.

The systematic review concluded that there was strong evidence to support undertaking disability management interventions in a multi-sector setting, based on their financial benefits. This finding is based on the four high-quality intervention studies. Three of the studies took a system-level perspective, and one (Karjalainen et al. 2004) was uncertain. This latter study did not find evidence to support the financial benefits of the intervention as compared to alternatives.

A more recent systematic review that focused on controlled studies of interventions for employees with back pain also evaluated the economic evaluation evidence (Carroll et al. 2010). Of the 12 studies included in the review, only four had an economic evaluation (Hlobil et al. 2007; Jensen et al. 2005; Loisel et al. 2002; Steenstra et al. 2006). The review concluded that multidisciplinary interventions with some form of workplace involvement are more likely to be cost-effective than interventions without such a component.

A third review on interventions with economic analyses considered a broader set of interventions—ones directed at managing musculoskeletal-related sickness absences and job loss (Palmer et al. 2012). The review identified 42 studies, eight of which had formal economic evaluations (Bultmann et al. 2009; Hlobil et al. 2005; Jensen et al. 2005; Loisel et al. 2002; Meijer et al. 2006; Sinclair et al. 1997; Steenstra et al. 2006; Torsten

Table 22.6 Summary of eight disability management intervention studies (Adapted from Tompa et al. 2008a)

Study	Country	Industry	Perspective	Intervention details	Economic evaluation results
Loisel et al. (2002)	Canada	Multi-sector	Insurance system	Four arms: (1) standard care, (2) clinical intervention, (3) occupational intervention, (4) clinical intervention combined with occupational intervention (main intervention under consideration)	At mean 6.4 years follow-up, the incremental net present value per claim (compared to standard care) was $16,176 for the clinical arm, $16,827 for the occupational arm, and $18,585 for the combination arm (per worker, 1991 Canadian dollars)
Jensen et al. (2005)	Sweden	Multi-sector	Societal	Four arms: (1) standard care, (2) behavior-oriented physiotherapy, (3) cognitive behavioral therapy, and (4) behavioral medicine consisting of behavioral-oriented physiotherapy and cognitive behavioral therapy	Compared to standard care, the full-time behavioral medicine program was the most cost-effective program, since it decreased sick leave and disability pension expenses by about 137,509 Euros per subject in the female group during the first 3 years after rehabilitation. The least reduction in expenses (compared to the standard group) was with the behavior-oriented physiotherapy (reduction of 54,452 Euros)
Arnetz et al. (2003)	Sweden	Multi-sector	Insurance system	A program that included early medical, rehabilitation, and vocational interventions, as well as ergonomic improvements and adaptation of workplace conditions	The net present value (direct savings) was 972,900 Skr ($162,150 USD) or 7,164 Skr ($1,195 USD) per case/person, with a benefit-to-cost ratio being 6.8
Karjalainen et al. (2004)	Finland	Multi-sector	Unclear	Mini-intervention group (a) consisting of an interview with a physician specializing in physiatry. Mini-intervention and worksite visit group (b) and standard care group (c)	The intervention groups had significantly less days on sick leave than standard care, and the cost of sick leave and direct health care were lower, but these cost differences were not statistically significant
Greenwood et al. (1990)	The United States	Multi-sector	Insurance system	Very early intervention (VEI) consisting of health and psychosocial evaluation post-injury (8 days after injury) and recovery management/case management	The intervention was as costly as standard care and was not more effective
Hochanadel and Conrad (1993)	The United States	Manufacturing/ warehousing	Employer	On-site industrial physiotherapy program for all injuries, both work related and not. Services include evaluation, treatment, physical therapy referrals, and education in the form of a back school	Net savings from the intervention were $8.3M USD. The benefit-to-cost ratio was 9:1
Linton and Bradley (1992)	Sweden	Health care	Unclear	Five-week physical and behavioral preventive intervention consisting of (1) physical therapy and (2) behavior therapy	The intervention resulted in savings of at least twice the costs of the program ($9,715 USD or 61,198 krona)
Wiesel et al. (1994)	The United States	Utilities	Employer	An intervention consisting of an injury surveillance system with all occupational injuries reported within 24 h. Based on clinical data, a diagnosis was obtained, and a course of management was recommended according to the standardized diagnostic and treatment algorithm specific to the injury's anatomic region. Time-loss injuries were reviewed on a weekly basis during the acute phase	For low back injuries, savings from lost time and light duty for the 10-year period were $2,655,728 (average savings were 59 % compared to the base year). For knee injuries, savings were $1,369,803 (average savings of 65 %). Total savings for low back and knee injuries were more than $4M dollars. All other MSK injuries were shown to have decreased, resulting in a cumulative 10-year savings of more than $4.1M (1990 USD)

Table 22.7 Summary of components of eight disability management intervention studies (Adapted from Tompa et al. 2008b)

Study	Intervention components				Intervention features				
	Ergonomics and other education (including back school)	Physiotherapy	Behavioral therapy	Work or vocational rehabilitation	Early contact with worker by workplace	Work accommodation offer	Contact between health-care provider and workplace	Ergonomic worksite visits	RTW coordination
Loisel et al. (2002)	✓	–	–	✓	✓	✓	✓	✓	–
Jensen et al. (2005)	–	✓	✓	–	–	–	✓	–	–
Arnetz et al. (2003)	✓	–	–	✓	✓	✓	–	✓	✓
Karjalainen et al. (2004)	✓	–	–	–	–	–	✓	✓	–
Greenwood et al. (1990)	–	–	✓	–	✓	–	✓	–	✓
Hochanadel and Conrad (1993)	✓	✓	–	–	–	✓	✓	✓	✓
Linton and Bradley (1992)	✓	✓	✓	–	–	–	✓	–	–
Wiesel et al. (1994)	–	–	–	–	✓	✓	✓	–	✓

et al. 1998). The interventions had multiple components, though three did not have workplace involvement. The review concluded that no study clearly proved or disproved a positive return on investment. Though most studies found net savings from the interventions, in two of the eight studies, 95 % confidence intervals suggested that net losses were possible.

Tompa et al. (2008a) also undertook evidence synthesis on specific intervention components. The review found moderate evidence of financial merits for interventions with (1) an ergonomics and other education component, (2) a physiotherapy component, and (3) a work/vocational rehabilitation component. Limited evidence was found for interventions with a behavioral component. For evidence synthesis on specific features of interventions, moderate evidence was found for the financial merits of interventions with (1) early contact with worker by the workplace, (2) work accommodation offer, (3) contact between health-care provider and workplace, (4) ergonomic work site visit, and (5) RTW coordination. No component or feature surfaced as a dominant characteristic due to the modest number of studies and the fact that two of the studies did not support the financial merits of the intervention being evaluated. Furthermore, even with those studies that were found to be worth undertaking for their financial merits, one could not attribute this to a specific component or feature.

22.6 Discussion and Summary

Though the literature on RTW and disability management interventions is quite extensive, the economic implication of such interventions is considered in few studies. Nonetheless, there appears to be emerging economic evidence in support of multifaceted RTW intervention programs with a disability management focus, particularly ones with a workplace component. Tompa et al. (2008a) found strong evidence to support undertaking disability management interventions in a multi-sector setting, based on their financial benefits.

Several literature syntheses have criticized the lack of systematic consideration of the resource implications of interventions in the OHS and disability prevention literature (DeRango and Franzini 2003; Goossens et al. 1999; Niven 2002; Tompa et al. 2008b; Uegaki et al. 2011). Future studies ought to include economic evaluation as a standard feature of intervention evaluation. A scan of recently published studies suggests that this gap is slowly closing; there appears to be many more economic evaluations than in the past.

The quality of methods in the few intervention studies that do undertake economic analyses is mixed. Shortcomings include the following: (1) weak study design, with a predominance of before/after evaluations, (2) disconnection between effectiveness and economic analysis, (3) reliance on disability benefit insurance expenses as the sole outcome measure, (4) failure to explicitly state the study perspective, (5) failure to adjust monetary values for inflation and time preference, (6) reliance on questionable assumptions with no sensitivity analysis, and (7) scant reporting of details such as context, sample size, time period, and so on. Efforts need to be made to improve the quality of the application of methods.

Most studies that undertake economic analyses focus on work absence costs (wage costs or workers' compensation wage-replacement costs) as the sole measure of productivity losses. One concern with using absence costs is that it is a poor measure of the value of health-related productivity improvements attributable to an intervention. Productivity may be affected even while an injured/ill worker is at work. Furthermore, to accurately assess productivity, one needs to consider the nature of the production process and the product/service being produced, since factors such as team production, time sensitivity, and substitutability of a worker will affect output (Pauly et al. 2002). Workers' compensation costs are a very poor measure of absence costs. They are simply transfers and do not capture the true value of disability days. Furthermore, workers' compensation claims do not reflect the full extent of work-related injuries and illnesses. Compensable injuries and illnesses may go unreported (Shannon and Lowe

2002), and others are not compensable. Some absences may be reported under other compensation programs.

In addition to improving quality, standardization of method and reporting of burden and economic evaluation studies are necessary to improve comparability across studies. Variation in labor market legislation and disability compensation programs across jurisdictions may complicate comparability, but standardization of analysis and reporting will at least facilitate understanding of transferability and generalizability. Future international research collaborations may promote further harmonization of methods and approaches for comparing studies across countries.

In summary, the resource implications of alternatives are important information for policy decision-making. It is likely to matter even more in the future as populations in many developed countries continue to age, changes in health patterns continue to unfold, and the cost of work disability continues to increase. Information on the burdens and resource implications of alternatives are invaluable for policy decision-making at the local and national levels. However, economic information is useful only if one can discern the nature and quality of the evidence and the transferability/generalizability of the findings reported in studies. In this chapter, we reviewed the measures and methods of burden measurement and economic evaluation to provide the needed foundations useful in understanding and interpreting these studies.

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23 Universal Design as a Human Factors Approach to Return to Work Interventions for People with a Variety of Diagnoses

Jon A. Sanford

23.1 Introduction

23.1.1 Background

Supportive work environments can enable individuals with a variety of diagnoses to gain and maintain employment (Gamble et al. 2006; Inge et al. 1998), reduce the risk of injury (Zwerling et al. 2003), and permit retention of productive and qualified employees (Blanck 1994; Unger and Kregel 2003). However, physical, organizational, and social environmental barriers in many workplaces often result in a misfit between the abilities and work needs of employees returning to work with disabling conditions. For these individuals, workplace accommodations serve as cost-effective return to work and stay at work interventions that compensate for unsupportive work environments and improve task performance (Schartz et al. 2006; Yeager et al. 2006; Yelin et al. 2000).

In the USA, Title I of the Americans with Disabilities Act (ADA) of 1990 requires employers to provide "reasonable accommodations" for a qualified worker with a disability to enable that individual to perform the essential functions or fundamental duties of a job. Under the ADA, the Equal Employment Opportunity Commission (EEOC) broadly defines accommodations as "any change in the work environment or in the way things are customarily done that enables an individual with a disability to enjoy equal employment opportunities" (EEOC 1999). More specifically, the EEOC considers workplace accommodations as: (1) a modification or adjustment to a job application process to permit an individual with a disability to be considered for a job (such as providing application forms in alternative formats like large print or Braille), (2) necessary to enable a qualified individual with a disability to perform the essential functions of the job, and (3) an equalizer, enabling employees with disabilities to enjoy equal benefits and privileges of employment (such as removing barriers to performing job tasks). Clearly, workplace accommodation strategies for employees with specific diagnoses are varied, including changes to the worksite, workstation, equipment and/or tools, adaptive strategies that change the way work tasks are done, organizational approaches that change policies and procedures about the way work is performed, scheduling, job assignments, and location of work (e.g., telework or work at home). However, with a focus on universal design as a human factors approach to return to work interventions for employees with a variety of diagnoses, this chapter will limit itself to

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interventions in the physical environment, including modifications and adaptations to space, products, and technologies used the workplace settings.

23.1.2 Problem

Despite the intent of US legislation, employees with disabilities not only continue to have lower levels of employment but also lower levels of job satisfaction and productivity than those without disabilities (McAfee and McNaughton 1997a, b; Schur et al. 2009; Uppal 2005; Yelin and Trupin 2003). A major reason for this disparity in work outcomes is the way in which workplace accommodations are understood and implemented under the ADA.

First, under the ADA, accommodations are seen as *activity focused*, intended to enable an employee "to perform the essential functions or fundamental job duties." Not surprisingly, interventions in the physical environment to accommodate a specific employee's essential job tasks are typically focused on facilitating getting to and using that employee's individual workspace. However, work is not just a series of tasks that occur in isolation. Rather, work is inherently social in nature where a sense of belonging is fostered by employee engagement and working toward a common goal. In fact, the majority of work requires some degree of cooperation and interaction with others (Kraut et al. 1990). Depending on job type, between 25 and 70 % of the work time is estimated to be spent in face-to-face interactions (Kraut et al. 1990; Panko 1992). As such, work should not only support individual activity independence but also participation in social roles (e.g., role in a work team) and interpersonal relationships (e.g., ties with coworkers) that are necessary to achieve a sense of belonging and well-being (Berkman and Glass 2000; Marshall et al. 2007; Pearce and Randel 2004).

Second, accommodations are focused on *barrier removal*, intended to remove social and/or physical barriers to job performance of an individual employee with a specific diagnosis. Whereas removal of barriers affords greater opportunities to return to work for employees with many different types of diagnoses, it is an approach that focuses on providing accessible design or assistive technologies tailored to each diagnosis at a specific point in time. As a result, accommodations may serve as a Band-Aid to conceal unsupportive features in the work environment for one individual, rather than addressing the endemic problems that would create a supportive work environment for many individuals with different diagnoses.

The result of the activity-based, barrier removal approach promulgated by the ADA is the arduous process of determining and implementing specialized accessible designs and assistive technologies based on an employee's specific diagnosis to enable him/her to return to work and maintain employment. Such an approach requires a considerable amount of time to implement, often delaying an employees' to return to work, benefits only the individual employee with a defined diagnosis and does so only at that particular point in time, and does little to address the employee's need to engage in group work tasks, interact with others, contribute to the workplace, and advance in his/her job. With the continued high unemployment rate for people with disabilities, this approach has clearly not succeeded in fulfilling the promise of the ADA.

The purpose of this chapter is to provide return to work stakeholders, including employers and rehabilitation professionals with a newer, more holistic way of thinking about work interventions that will benefit employees with a variety of disabling diagnoses at the time they return to work, as well as over their working lives. More specifically, this chapter will introduce human factors and universal design as intervention processes and products that will result in more usable and inclusive work environments for all employees, without the need for adaptation or specialized design.

To familiarize employers and rehabilitation professionals with universal design, this chapter not only describes what universal design is, but it also contrasts it with what it is not—those diagnosis-specific, specialized accommodations with which rehabilitation professionals and many employers are already very familiar. More specifically, it makes the case that individualized specialized design defines a strategy for return to work interventions for workers with specific diagnoses at a singular point in time. Universal design, in contrast, is a strategy for applying a human factors approach in return to work and stay at work interventions for workers that transcend diagnosis and time.

23.2 Universal Design

23.2.1 Universal Design as a Facilitator of Activity and Participation

Universal design is a term originally attributed to Ron Mace, an architect, polio survivor, wheelchair user, and advocate of legislation promoting accessible design. Despite Mace's support for barrier-free legislation, he developed the concept of universal design to describe design of everyday products and spaces that would overcome the stigma and segregation that resulted from traditional accessible design strategies (e.g., ramp at the back door vs. stairs at the front). As defined by Mace, universal design is the design of all products and environments to be usable by all people to the greatest extent possible without the need for adaptation or specialized design (Mace et al. 1991). By designing products and environments for all people at the same time, rather than removing barriers to the functional abilities of individuals with specific diagnoses, universal design engenders positive activity and participation outcomes. As a result, universal design is not just about access for some, it is about usability and inclusion for all.

In the workplace, where traditional rehabilitation strategies that use specialized assistive technologies and accessible designs to improve performance of essential job tasks on employees with specific diagnoses (e.g., ramps for individuals who require wheelchairs or tactile warnings for individuals who are blind), universal design enables engagement in work tasks and participation in work roles on employees with all types and levels of abilities. As a result, the extent to which any design is universal is dependent on the degree to which it accommodates the widest array of employees and potential employees (Sanford 2010).

Although traditional return to work intervention strategies have been technically successful in enabling employees with specific diagnoses to perform essential work tasks, they have done so by creating work environments that segregate the very population that they are intended to integrate. Such experiments in the "activity-begets-participation" paradigm have demonstrated that even if we build it, not everyone will come or, at least, remain in the workplace. In contrast, universal design is rooted in a more assimilative rehabilitation paradigm that integrates human factors approaches into return to work interventions makes performance of work tasks (i.e., usability of accommodations) and participation in the work milieu (i.e., inclusivity of accommodations) the design norm rather than the exception.

However, whereas universal design is conceptually appealing, it is a utopian design ideal that may not always be wholly achievable. Universal design imagines what a world should be, not necessarily what it will be. Therefore, adopting universal design as a return to work intervention is not an easy task. It requires looking beyond myopic twentieth-century paradigms that focus on return to work interventions based exclusively on individual diagnoses, functional limitations, and work activities and adopting a broader approach that focuses on both work activity and participation in workplace for employees with a variety of diagnoses.

23.2.2 Universal Design as a Human Factors Approach

Conceptually, universal design does not view disability as a singular status requiring specialized intervention but a continuum of ability that would benefit from less demanding design. It is based neither on accessible dimensional requirements nor on a one-size-fits-all "McDonald's" approach to enhancing function. Rather, it is an approach to design that accommodates the widest possible range of body shapes, dimensions, and movements (Imrie 2004) through contextually appropriate solutions. Because every context represents a unique set of needs and opportunities, a universal design approach allows for contextual (i.e., considerations for coworkers, organizational policies, physical environment, or cost), rather than individualized interventions.

According to Steinfeld (1994), there are two ways in which design can broaden the focus of interventions from one or a group of individuals with the same diagnosis or functional impairment to as many as possible. First, designs can "forgive" limitations by accommodating different ways in which they can be used. Examples might include a door handle that can be used with different grips or body parts. Second, designs can "adapt" to users' abilities rather than the other way around, such as increasing timing of traffic lights to enable slower pedestrians to cross a street rather than making them rush to beat the light.

In addition, universal design, by its very nature, represents an intervention in which usability and inclusivity are built-in. As a result, universal design promotes activity as well as participation. Although the accepted definition of universal design attributed to Mace does not explicitly state that it encompasses activity and participation, both are basic underlying Principles of Universal Design. In fact, Mace, himself, asserted that universal design should "integrate people with disabilities into the mainstream" (Story et al. 1998). On the other hand, other terms used interchangeably with universal design are more explicit about inclusion. For example, the definition of Design for All, the most commonly used term for universal design in the European Union, states that it is "design for human diversity, social inclusion and equality" (Design for All Europe 2008) and that the aim is where "… everyone, including future generations, regardless of age, gender, capabilities or cultural background, can enjoy participating in the construction of our society" (Design for All Foundation n.d.). To reconcile these omissions from the original definition of universal design, Steinfeld and Maisel (2012) have suggested a new definition of universal design as: "a process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation" (p. 29).

Regardless of what definition one uses, the concept of universal design is a design approach that emphasizes both the human factors attributes that determine both design usability and social inclusivity. These qualities are captured by and articulated in the widely accepted Principles of Universal Design, developed a decade and a half ago by a group of researchers, designers, and advocates at the Center for Universal Design at North Carolina State University.

23.2.3 Principles of Universal Design

With support from the National Institute on Disability and Rehabilitation Research, ten leading proponents of universal design, including architects, industrial, landscape, and graphic designers, and engineers developed the seven Principles of Universal Design (Connell et al. 1997) to identify the general performance goals and guidelines for universal design. Until that time, there was no guidance for understanding or applying universal design other than a conceptual understanding that framed the concept. In less than a decade, the principles had been translated into a number of different languages and reprinted on hundreds of websites around the world. This is not to say that the principles are perfect. On the one hand, they have never been validated. On the other, they may be too broad, too generic, and too difficult to apply. In fact, even the original authors have differing opinions on if or how they should be revised (Sanford 2012). Nonetheless, the principles have had relative longevity and are clearly recognized as the authoritative source for describing universal design.

The principles address both activity and participation. Participation through inclusivity is the basis of the first principle of equitable use, whereas activity through usability (i.e., designs that forgive and adapt) is expressed in the human factors goals of performance, ease of use, comfort, security, and privacy. These are reflected in Principles 2–6: flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, and size and space for approach and use.

23.2.3.1 Principle 1: Equitable Use

The design should be equally usable by and marketable to everyone. It should avoid segregating and stigmatizing users. Providing the same (identical, if possible) means of use for everyone (e.g., the same entry) should accomplish that goal. Providing the same means of use for everyone eliminates the need not only for specialized designs but also signage that calls attention to the specialized design (Fig. 23.1). For example, providing a no step entrance into a building will enable everyone to enter in the same way and avoid segregating users who cannot climb stairs. In addition, by providing the same design for everyone instead of everyday design for some and special designs for a few, the design should be equally appealing and desirable for everyone. This will not only enhance usability but also marketability.

23.2.3.2 Principle 2: Flexibility in Use

Design should accommodate a wide range of individual preferences and abilities. Design should be forgiving, allowing use in more than one way, such as being able to use either hand or obtaining information from either visual signage or auditory announcements. It should also be tolerant of different abilities by facilitating and adapting to the user's levels of precision, accuracy, and pace (Fig. 23.2).

Fig. 23.1 Equitable entrances. *Equitable use* means everyone uses the ramp to access the building in the same manner

23.2.3.3 Principle 3: Simple and Intuitive Use

Regardless of the user's experience, knowledge, language skills, or level of concentration, the way in which the design is used should be easily understood (Fig. 23.3). In addition, the use of a

Fig. 23.2 Flexibility. *Flexibility in use* permits alternative methods of use including open hand, closed fist, or elbow

Fig. 23.3 Simple and intuitive. *Simple and intuitive use* can be a few large buttons, an iconic numeric keypad, and bright colors, i.e., big red button is an emergency

Fig. 23.4 Perceptible information. *Perceptible information* can be achieved by the use of high-contrast, directional, and tactile information

design should be natural, intuitive, obvious, and spontaneous, even if the design has never been seen or used before. To accomplish this goal, unnecessary complexity should be eliminated, and information about the use should be presented in a manner that is consistent with its importance. For example, start and stop buttons could be larger, unique colors and arranged in a linear order. In addition, the design should provide prompting and feedback, such as a lighted elevator button, so that it is clear that it has been used properly.

23.2.3.4 Principle 4: Perceptible Information

For a design to effectively communicate with users who have different abilities to see, hear, communicate, and understand, it should use as many different modes (e.g., pictorial, verbal, tactile) as possible to communicate essential information to users. In addition, regardless of the mode used, it should maximize "legibility" of essential information (Fig. 23.4) by providing adequate contrast (e.g., visual, auditory, cognitive) between essential information and its surroundings, such as white text on a black background, differentiating elements in ways that can be described (i.e., make it easy to give instructions or directions, such as "push the red button first") and enabling users to use any assistive devices, such as low vision or hearing aids, that they might require.

23.2.3.5 Principle 5: Tolerance for Error

Error is both an issue of personal safety (e.g., leaving the oven on or turning the volume up too high on an assistive listening device) and prevention of inadvertent mistakes that can lead to loss of objects, data, time or money, or frustration. As a result, the design should minimize hazards and unintended actions that could have adverse outcomes. To do so, unconscious actions in tasks that require undivided attention should be discouraged, fail safe features such as arranging elements so that those that are used most frequently are most accessible and those that are least used and/or hazardous are omitted or protected, and warnings of potential hazards and errors are clearly provided (Fig. 23.5).

23.2.3.6 Principle 6: Low Physical Effort

Physical ease of the use is perhaps the one quality that is most commonly associated with universal design. However, low physical effort goes beyond ease of the use to include efficiency, comfort, and minimizing fatigue. To accomplish these outcomes, the design should minimize strength required by enabling the use of low operating forces (Fig. 23.6), minimize the need to apply sustained force (e.g., holding a faucet to keep the water on), and minimize repetitive and simultaneous actions (e.g., pushing while turning). In addition, comfort and fatigue are not only linked to strength but also to the position from which the design is used, suggesting that design should be able to be used from a natural body position.

23.2.3.7 Principle 7: Size and Space for Approach and Use

Size and space is the most architectural of the seven principles, focusing primarily on amount

Fig. 23.5 Tolerance for error. *Tolerance for error* can take on many forms such as the use of tactile and visually contrasting floor materials to indicate the location of intersections and stairways

Fig. 23.6 Low physical effort. *Low physical effort* is afforded by an electronic faucet that requires no physical force to operate

Fig. 23.7 Size and space. *Size and space for approach and use* includes maneuvering space for right- or left-handed approach and use as well as a clear line of sight to important elements

and configuration of space (e.g., a bathroom that large enough to turn a wheelchair around) as well as the hardware (e.g., door handles, appliance knobs, and faucet handles) and other product components that are used within a space. In addition, hardware and products should accommodate variations in hand and grip (e.g., door handles that are large enough to grasp). Finally, size of space should accommodate independent and assisted use, including any assistive technologies, such as a wheelchair or walker that might be needed. In addition, the size and arrangement of space should enable important design features, such as an information kiosk or desk, to be clearly visible, accessible, and obtainable regardless of stature or mode of travel (Fig. 23.7).

23.3 Universal Design as a Return to Work and Stay at Work Intervention

23.3.1 Rationale for Universal Design as a Return to Work Intervention

The need and benefits of interventions to aid in return to work is undeniable. However, a number of factors suggest that all employees as well as employers would benefit from a human factors universal design approach to return to work interventions. First, providing an individual employee with return to work and stay at work interventions is a lengthy, onerous, and potentially costly process of assessment based on diagnosis, task requirements, and barriers to performance and the work involved in determining, obtaining, and implementing interventions. As a result, many workers, particularly those who are aging, either do not receive the accommodations they need in a timely manner or do not receive them at all. In addition, research suggests many employees do not even request accommodations due to coworker negative attitudes toward special accommodation that will help an employee return to work. Finally, recent studies have begun to demonstrate that without consideration of inclusivity, ADA activity-based accommodations alone are not sufficient to promote satisfaction or improve productivity of employees with a variety of diagnoses.

23.3.1.1 Effects of Aging in the Workplace

There are more than 16 million Americans over 55 who are either working or seeking work in the USA. Over the next several years, the number of workers aged 55 and older is expected to grow twice as fast as the total workforce as the "baby boom" population matures and life expectancy increases. In addition, research on work and disability indicate that people between the ages of 55 and 64 experience work disability at nearly double the rates of those aged 45–54 years and at rates two and half times of those aged 35–44. This finding suggests that a large cohort of employees must either retire prematurely or receive specialized interventions to return to work after the onset of a debilitating health condition or trauma. Yet, despite the demographic shifts and increasing disability, the percentage of older workers aged 50–60 years old receiving accommodations declined from 31 % the mid-1990s to 22 % in 2000 (Lightfoot and Lum 2006).

Research by McMullin and Shuey (2006) also suggests that older workers, and particularly those that are approaching retirement age, were less likely than younger workers aged 20–39 years to acknowledge a need for workplace accommodations to do their job. Moreover, older employees who attributed their functional limitations to the normal aging process were twice as likely to have an unmet need for accommodation as those who attributed their condition to another diagnosis. Moreover, when older workers attributed their limitation to aging, they were less likely to receive accommodations than younger workers. Together, these findings suggest that both employees and employers view aging as a natural process that results in functional limitations that are not perceived as disabilities, and therefore do not require accommodations.

Like McMullin and Shuey (2006), Williams and his colleagues (2006) found that regardless of diagnoses, older workers often received no workplace accommodations, even though the majority of respondents reported that their functional limitations prevented them from performing job tasks and that accommodations were essential for task performance. In addition, the researchers found that there were differences in the types of accommodations used by older and younger workers who had the same diagnosis. For example, among workers with hearing loss, younger workers used sign language more frequently, while pre-retirement and retirement age workers used more hearing aids. Working age adults with vision impairments used electronic documents, Braille, and CCTVs more than pre-retirement or retirement age workers.

Together, the high rate of functional limitation associated with aging, lack of return to work and stay at work accommodations, and the likelihood that one's place of work is designed for younger, able-bodied workers can compromise the ability of older workers to maintain employment and may lead to premature retirement. Nonetheless, older adults with a variety of diagnoses and limitations who want to continue to work beyond traditional retirement age represent the changing face of the workplace. As this population grows, so does the need for return to work and stay at work interventions to support differences in abilities within and across employees and their lifespans. Universal design, which promotes usability for all workers throughout their working lives without the need for adding (i.e., admitting the need for) special accommodations, offers an alternative approach to employment interventions.

23.3.1.2 Effects of Coworker Attitudes

Return to work interventions that are used to accommodate an individual employee often create negative feelings and resentment among coworkers who believe that an accommodated worker is receiving preferential treatment (Collela 2001; Stoddard 2006). First, coworkers may perceive an accommodation as unfair because it increases the levels of the accommodated person's rewards or outcomes, particularly when the accommodations, such as a special chair, being able to sit while at work, at rest periods, or working at home, are viewed as valuable or perks that they do not have (Collela 2001). Second, employees may believe that an accommodation gives an unfair advantage to a coworker with a disabling diagnosis by making work tasks easier (Paetzold et al., 2008). Finally, coworkers may perceive that the accommodation will use up valuable resources, thus reducing their own rewards and making their own jobs less desirable (Collela 2001).

In fact, the way in which an employee with a disabling condition expects coworkers to react to a return to work interventions may not only influence his/her own decision to request an accommodations (Florey 1998) but also a supervisor's decision to grant a request (Cleveland et al. 1997). Even if a request is granted, coworkers' reactions, morale, and productivity may be considered as a factor that enters into the "cost" of accommodation (Collela 2001). As a result, universal design interventions that are not perceived as special and that can also benefit other employees might be more acceptable to coworkers, supervisors, and those who need accommodations themselves.

23.3.1.3 Effects of Social Interactions in the Workplace

To date, interventions for return to work have focused on individualized interventions (e.g., accessible design and assistive technologies) added onto the work environment to remove barriers to individual work tasks. Unfortunately, the barrier removal approach does not comprehensively take into consideration the role of work and the level of engagement that it involves in people's lives. While individualized accommodations are vital, a more inclusive approach to address the needs of employees with a variety of diagnoses across the range of what they do and need to do on a daily basis, as well as across their working lives, is lacking. More specifically, the accommodation approach has not taken into account an individual's need to participate in the cooperative work group that is manifest in the interactive social nature of work and that is crucial for successful work outcomes (Gates 2000). Thus, despite the success of accommodations in enabling employees with disabilities to perform individual work tasks (Butterfield and Ramseur 2004; JAN 2010; Mendelsohn et al. 2008), employees with disabilities consistently report lower job satisfaction than those without disabilities (McAfee and McNaughton 1997a, b; Uppal 2005).

However, this discrepancy in job satisfaction may not be solely an artifact of disability. New research suggests that job satisfaction and productivity are directly linked to social interactions in the workplace (Uppal 2005). In fact, recent research at the Rehabilitation Engineering Research Center on Workplace Accommodation at Georgia Tech indicates that job performance, worker well-being, job satisfaction, and productivity are functions of interventions that address both activity and participation outcomes. In a survey of workers with and without disabilities supported by the US National Institute on Disability and Rehabilitation Research (NIDRR), researchers found that despite having interventions to support work tasks, employees with disabling conditions reported overall lower levels of participation, productivity, and job satisfaction compared to employees without disabling conditions (Yang et al. 2010a, b). In contrast, employees with disabling conditions with interventions that supported both work activity and participation reported higher levels of satisfaction and productivity compared to employees with disabling diagnoses who only had interventions to support work activity and were not significantly different from employees without disabling conditions. These findings suggest that universal design interventions, which support both activity and participation needs of people with disabling diagnoses are critical to productivity and job satisfaction, which are two of the most important factors linked to remaining in one's job.

23.3.2 Universal Design Features as Return to Work and Stay at Work Interventions

Unlike housing in which tasks and activities are fairly homogenous and the design of spaces to support these activities are fairly consistent, work settings are quite varied in the types of activities and in their design. Therefore, this chapter focuses on work activities that are common to virtually all work settings and the generic types of environmental features to support these activities. These activities include getting in and out of the worksite, moving around the worksite, and using the workstation (including using computer and peripheral equipment and engaging in interpersonal communication).

To facilitate these types of activities, universal design interventions include the amount and configuration of space, the location of products, technology and other equipment in that space, or the design of the products equipment and technology themselves. These features can be standard building products, hardware, technology, or equipment that have been placed differently, such as a standard electrical outlets that are located higher above the floor than usual to minimize bending and reaching, while switches and other controls can be lowered down to minimize reaching and enable viewing of displays. Alternatively, features can be selected for specific attributes that have both function and functionality for people with different types of abilities, such as communication systems that have large buttons and both audio and text output.

23.3.2.1 Getting In and Out of the Workplace

Unlike accessible design features, such as a ramp at the public (i.e., non-employee) entrance for employees who use wheelchairs, universal design solutions enable all employees to enter and exit in the same place and same manner. As a result, usability and inclusivity are both enhanced through direct access from all potential drop-off points (e.g., parking, public transit, and sidewalk) to the entrance(s) used by employees.

Sloping walkways (i.e., less than 1:20 slope) are the most advantageous entry feature as they enable all individuals to get to an entrance in the same manner, with low effort, while at the same time being integrated with the overall context of the worksite and community. In the absence of one point of access/egress for all users, flexibility is increased by providing multiple means of getting to the entrance, such as wide-tread-low-riser steps in addition to a ramp or lift that are integrated into the overall design. Paths to the entrance, including changes in level (e.g., stairs and ramps), are smooth, hard, slip-resistant surfaces to minimize obstructions or fall risk and are wide enough along the entire length (given the expected volume of traffic) to accommodate at least two people side by side, whether they are walking or using mobility devices, such as bicycles, wheelchairs, or personal transports (e.g., Segway).

To identify specific routes and places along the routes, different surface materials, and pathway edges contrast in color and texture (e.g., paved walkways, brick steps), edges are clearly defined by grass or planting beds, curbs, walls, fences, bollards, railings or planters; landmarks, such as fountains, statues, and signs, are strategically located; and there is a comprehensive, multisensory information system with high-contrast, large text directional signs, tactile maps, and talking signs (Fig. 23.8). Paths are evenly illuminated by lighting operated by motion detectors or timers; emergency communications and video surveillance equipment are placed at strategic locations along the route; and railings or low walls guard against fall at all edges of drop-offs (e.g., platforms and pools).

The employee entrance(s) is/are well marked and clearly visible from the route(s). The doorway is differentiated from the rest of the building by higher lighting levels, materials (e.g., glass vs.

Fig. 23.8 Automatic motion sensor door opener. For buildings that have controlled access, keycards with embedded RFID tags permit hands-free access if the reader is located in the path of travel and at a height that is convenient for all employees

masonry or vice versa), color, and/or form to make it easier to identify from the path to the building. At the doorway, the entrance is level with the exterior and interior surfaces, and there is sufficient space to maneuver any travel aids, including mobility device or bicycles. An automatic door operated by a pressure switch on the ground, motion sensor, or RFID reader provides hands-free operation (Fig. 23.8). The sliding, revolving, or hinged door opens wide enough for employees to pass through easily while carrying backpacks, briefcases, packages, and other work materials or using mobility devices.

23.3.2.2 Moving Around the Worksite

Inside the worksite, layout of the spaces and circulation is consistent with employees' expectations. Circulation, both horizontal (i.e., hallways) and vertical (i.e., stairs, ramps, elevators and lifts), is clearly visible from the entrance, uncluttered with furniture and free of level changes in the direct path of travel. When level changes occur in a corridor, tactile and visual warnings are provided at the top, and when possible, ramps, rather than stairs, are used so that traffic can continue to flow in the direction of travel. Corridors are wide enough to accommodate two people side by side, whether they are walking unassisted or using mobility devices or canes.

Corridors and paths of travel across open spaces are differentiated by changes in flooring materials, textures, and color. Continuous handrails along corridors assist individuals with balance and gait limitations, and tactile information on the handrails identify specific rooms along the corridor for employees who have difficulty seeing or are just not paying attention to where they are going (Fig. 23.9). The multisensory signage system includes high-contrast, large text signs, tactile signs, and audio signs as well as landmarks, such as statues or columns that are strategically located to identify different hallways, places along the hallway, and other key destinations.

Lighting, in all corridors, is even, and there is a gradual transition between different spaces, such as the hallway and workspaces or stairwells. Transitions between spaces have smooth changes between flooring materials and contrast in color and texture. Walls and floors aremade of different materials and have different colors and textures so as to look, feel andreflect sound differently These design characteristics will provide wayfinding information for sighted and unsighted employees.

In buildings that have more than one level, the slope of stairs between levels is as gradual as possible with handrails at multiple levels on both sides. Stairs as well as an elevator or vertical lift are located in convenient places to minimize the distance that any employee has to travel. Elevator call buttons and controls are located at a convenient height, have large easy to use buttons, and provide redundant visual, tactile, and auditory feedback for all employees.

23.3.2.3 Using the Workstation

Workstations (Fig. 23.10) are designed for optimal performance of specific work tasks by focus-

Fig. 23.9 Corridor. Redundant and multisensory wayfinding systems including color changes in signs and floors at different rooms as well as tactile information on walls, floors, and handrails facilitate moving around the work environment

Fig. 23.10 UD work station. Flexibility in height enables easy access to all parts of a workstation and facilitates work tasks from standing or seated positions

ing on a number of key characteristics that support worker's abilities to perform those tasks across his/her work-life as well as for other workers to perform those specific tasks across the life of the tasks. Where job tasks permit, workstations have high sound-resistant walls to minimize ambient noise levels and enable each worker to control the noise levels in his/her own workspace, rather than creating large open areas for individual workspaces. Workstations are arranged and oriented to enable employees to have visual access to coworkers in order to communicate effectively.

Controls on equipment and drawer hardware are large, contrast from the background, enable operation by multiple modalities or methods, do not require grasping or simultaneous actions (e.g., push and turn), and minimize dexterity and operating forces. Alternative input mechanisms, such as remote controls and speech recognition, are provided to minimize reaching or to eliminate manipulation altogether.

Using the work surface. Every workstation provides sufficient knee space and toe clearance below the work surface to enable employees of any stature and chairs with a range of seat heights (including wheelchairs) to be as close to the workstation as possible.

Work surfaces provide sufficient space and locations for work items, controls, keyboards, and other work objects within easy reach, thus enabling their use by the maximum number of workers. Those items that are used most frequently are located in the closest positions possible. In most cases, employees can reach and use controls and work items with the least change in body position. However, chair that slides along the entire length of the work surface enables workers adjust their position so that all work items, equipment, and controls are within reach.

Work surfaces are a matte finish to minimize glare. The amount of light necessary depends on the requirements of the task, so a combination of natural and artificial light sources that can be adjusted through the use of motorized blinds to minimize reaching and grasping and overhead lights and task lights with touch controls directly on the work surface is used. This flexibility enables employees to adjust the lighting to fit the requirements of their tasks and individual abilities.

Maintaining support and position. For tasks that require standard work surfaces, adjustable ergonomic chairs enable employees to be supported in the right position; adjust seat height and tilt to distribute body weight among feet, legs, and buttocks; change back height and tilt to spine; and alter armrests to position the arms and hands for the task at hand. On the other hand, some job tasks, such as grocery store checkouts and many types of equipment repair, have traditionally been performed standing. However, not all employees can sit or stand for long periods of time, if at all. As a result, regardless of the tasks to be performed, all workstations, within the limits of the tasks to be performed, provide flexibility to enable either seated or standing use by as many employees as possible for as long as possible. To do so, adjustable workstations have work surfaces that raise, lower, and pivot to enable employees to change positions as needed to minimize effort and maximize abilities.

23.3.2.4 Computing

Most computer equipment is plug and play. As a result, most workplace accommodations for computing are, in fact, universal design. A variety of alternative input devices, including ergonomic keyboards, keyboards, or voice input, are available depending on employee preferences and needs. Input devices are wireless to provide flexibility, independent placement, and ease of use; keyboards have tilt-adjustable supports to increase comfort and reduce fatigue. All workstations are equipped with a high-contrast, large screen monitor on a tilt-adjustable stand that raise, lower, and tilt to reduce eye, neck, and back strain. In addition, all computer systems are capable of having dual monitors, and a second monitor is available for those who desire one. To complement the large monitors, employees are encouraged to use screen enlargement and contrast enhancement options that are built into the computer's operating system. Finally, the workspace is configured to enable employees to access computer drives and other peripherals (e.g., printers and scanners) with either hand.

23.3.2.5 Interacting

To enable face-to-face communication, all communal spaces and individual workspaces are usable by any employee, regardless of ability. Informal communal spaces, such as hallways and break rooms, are designed to encourage social interaction, while formal ones, such as meeting rooms and cafeterias, provide opportunities for planned as well as impromptu meetings. Social spaces are ability-friendly to enable all workers to benefit equally from workplace interactions. Meeting spaces are located near workstations and have a clear, simple, path of travel to make spaces easy to find and to minimize travel time. In addition, routes to meeting spaces are continuous routes that do not require the use of stairs. They use contrasting colors and floor materials and provide high-contrast, large text, iconographic and tactile information to identify spaces and aid way-finding.

Informal meeting spaces are intentionally and strategically located, with extra space and casual seating provided where employees have the opportunity for serendipitous encounters, such as at a copy machine, a coffee pot, water cooler, stair, elevator lobby, or hallway intersection. Meeting spaces have sufficient space and are equipped with chairs and tables to facilitate social interaction among all employees and groups of employees regardless of ability or use of assistive devices. Furniture is arranged in social spaces in clusters to facilitate interaction among employees. Tables have movable chairs and can be arranged in different configurations to enable use by differing size groups and employees with and without mobility aids. There are no obstructions to enable clear lines of sight so that communication partners can clearly see each other and any visual information in the work environment. There is a good acoustical environment to ensure that important information is intelligible and reverberation time and characteristics are optimized by minimizing hard reflective surfaces and using sound absorbing materials on walls, floors, and ceilings or covering windows with shades/curtains. Background noise is minimized to ensure that unwanted noise is not distracting and does not mask speech and other important information. Formal meeting spaces are equipped with assistive listening system (e.g., transmitter and receiver) to amplify sound to enable individuals who benefit from amplification to focus directly on the sound source.

23.4 Discussion

As the work force becomes increasingly diverse, universal design as a rehabilitation strategy in the workplace has the potential for enabling workers of all ages and abilities to return to work, stay at work, and participate equally and productively throughout their work-life cycles. Universal design potentially eliminates or, at worst, reduces the need for special individualized accommodations, thus saving resources and enabling all employees to use and share the same resources. This approach not only facilitates employment for employees with a variety of diagnoses, it can reduce cost by eliminating the need to hire new worker. Most importantly, universal design interventions can enhance sense of inclusion, belonging, and participation in the work milieu. These outcomes are not only critical to increasing well-being, job satisfaction, and productivity for individual employees but also enable employers attract and retain a competitive workforce—ultimately resulting in increased profitability and success.

Clearly, universal design as a return to work and stay at work intervention makes good sense—for workers, employers, and society. Yet, despite its appeal, there are few good examples of universal design interventions in the workplace. This problem is not inherent in universal design itself but rather results a variety of interconnected barriers that have limited the adoption of universally designed products, technologies, and spaces as return to work and stay at work interventions.

The most conspicuous barriers to adoption of universal design as a return to work intervention are governmental policies based on outdated twentieth-century paradigms. These policies promote specialized designs and technology to remove barriers to individual work tasks, despite their limited and calculated benefits for only one person at one point in time, at the expense of using generic universal designs that facilitate work tasks and work participation and have potential for multiple and far reaching benefits.

Clearly, the traditional "if-we-build-it-they-will-come" model in which the performance of essential work activities is expected to result in participation and equality in the workplace only addresses the activity half of the equation while ignoring accommodations that promote inclusivity and participation. In addition, reimbursement policies based on a "one-person-at-one-time" paradigm restrict the playing field of interventions for both individual employees and coworkers who may have different diagnoses. Further, neither of these two policy models actually considers important situational and contextual factors in the workplace, such as impact on the physical and social environment, effectiveness of intervention in the context, preferences, aesthetics, and stigma that determine the best rehabilitation intervention possible.

Reimbursement (i.e., who pays for the interventions) is an important issue as it is the way in which many interventions for return to work are implemented in the USA. Depending on the program and employee needs, Medicare, Workers' Compensation, Vocational Rehabilitation, the Internal Revenue Service (IRS), and other programs will cover costs for specialized accessible design, assistive devices, and medical technologies to improve an individual's ability to perform essential tasks in the workplace. However, these programs typically will not cover the cost of most universal design interventions because they are not "special," even if they would benefit the individual and save money in the long run. For example, the Medicaid/Medicare reimbursement system is so invested in the "one-person-at-one-time" strategy that specialized medical devices and equipment are preferred over universal designs even when the latter are less expensive, work better, and are preferred by the user. In a 2009 article in the New York Times, Ashlee Vance (Vance 2009) reported the case of an individual with amyotrophic lateral sclerosis who was approved by government insurance to purchase an $8000 augmentative communication device that would turn text to speech. Whereas the device was an ordinary laptop computer with specialized software, under government insurance requirements, the Windows operating system had to be removed, and any non-speech functions like sending e-mail or browsing the Web had to be blocked. After a short period of time, the user purchased a $300 iPhone 3G running $150 text-to-speech software because the approved device was too clumsy and inefficient. Despite the enhanced usability and utility of the iPhone, it was not reimbursable because it was a telephone.

At the beginning of the twenty-first century, the World Health Organization (WHO 2001) proposed a more integrative model of disability, health, and functioning that asserts that body function and structure (e.g., diagnosis), activity, and participation are individually and collectively influenced by contextual factors. Despite widespread acceptance of the WHO model across the globe, long-standing policies regarding the goals of and reimbursement for workplace accommodations have been slow to change. Yet, such change is necessary for people with a variety of diagnoses to achieve full participation in the workplace.

Toward that end, universal design is clearly a return to work and stay at work intervention that is a means to achieve these positive ends. While removing barriers is specific to an individual employee, universal design interventions not only benefit the individual but also have the potential to also benefit others, including coworkers with and without other disabling conditions, employers, and society who share social environments and who also encounter usability and inclusivity difficulties due though their own functional limitations, even if these limitations do not qualify as disabilities. In doing so, universal design can also have economic benefits that support health, activity, and participation needs of all individuals without the need for (potentially expensive) specialized interventions.

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Part IV

Best Return to Work Interventions and Practices in Key Diagnoses

Conceptual, Methodological, and Measurement Challenges in Addressing Return to Work in Workers with Musculoskeletal Disorders

24

Chris J. Main and William S. Shaw

24.1 Introduction

Since the mid-1980s, there has been increasing recognition in the management of musculoskeletal disorders of the need to move from a biomedical and biomechanical perspective to a broader biopsychosocial perspective (Gatchel et al. 2007; Waddell 1987). The broader perspective has had impact on the clinical management of pain, evidenced in the development of multifaceted treatment and more recently in the development of patient-centered medicine that attempts to place the patient, rather than patient pathology, at the core of the intervention.

Similarly, the field of occupational medicine has seen a shift from a primary focus on the physical demands of work, the characteristics of the working environment, and productivity to a focus on well-being, engagement in work, and the social context of work. In this, the first of two companion chapters on work disability in people with musculoskeletal disorders, consideration is given to the conceptual frameworks which underpin the management of work disability. The problem is analyzed using the Flags framework that focuses on different types of obstacles to recovery (or reengagement), which need to be identified and appraised as a precursor to the design of interventions. The focus is on both the worker and the workplace. An appraisal is offered of the difficulties in evaluation and challenges in measurement. Some conclusions are offered as a precursor to consideration of the development and design of interventions in the second (companion) chapter.

24.2 A Conceptual Framework

The high costs of back-associated work disability in terms of lost productivity, wage-replacement costs, and costs of treatment have long been recognized. Traditionally, the primary focus of workplace initiatives has been on injury prevention viewed principally from a biomechanical or ergonomic perspective. However, injured workers do not all return to work (RTW) as expected. When symptoms persist, matters become more complex, and although the consideration of the physical demands is important, the determinants of recovery and successful return to work require a biopsychosocial perspective (Sullivan et al. 2005) necessitating reconsideration of our intervention strategies and their effectiveness in tackling work disability and in facilitating successful and sustained RTW after illness or injury.

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In considering the various treatment and management options, which may be available, a distinction can be made between interventions with a primary *clinical* focus (in terms of content and anticipated outcome) and those with a primary *occupational* focus. Notably, Sullivan et al. (2005) further distinguish between *worker-centered* and *workplace-centered* interventions; this distinction will be used to group the interventions. In the Flags framework (Kendall et al. 1997, 2009), differentiating individual, workplace, and wider contextual factors will also be invoked, as a way of distinguishing the various stakeholders involved in the RTW process in general and in addressing specific obstacles to recovery/optimal reengagement. Indeed, MacEachen et al. (2010) describe the additional "toxic dose" of system problems that can confront the injured worker, over and above the specific effects of the initial injury.

24.2.1 The Nature of the Workplace

The workplace is first and foremost a complex psychosocial environment and as such may be viewed radically differently by different stakeholders, who differ in their knowledge and responsibility for the health/work interface. Not only are there differences in the perception of work across cultures, jurisdictions, and types of work and employer, organizations may differ even within the same industry in terms of workplace culture and management of injury and illness.

However, work should not be seen exclusively as an inappropriate place or source of risk for persons with ill health (Waddell and Burton 2006). In fact, work can be a means by which to reduce some of the broader biopsychosocial risks for chronic pain and to promote musculoskeletal health (Wynne-Jones and Main 2010). Thus, new possibilities for facilitating reengagement in work become available.

24.2.2 The Impact of Musculoskeletal Symptoms

Musculoskeletal disorders (MSDs) may interfere not only with function but also with sleep, leading to fatigue and difficulties in sustained concentration, which may lead not only to safety issues but also are certainly likely to have an adverse effect on performance. Matters can be compounded by the side effects of medications, thereby decreasing the likelihood of early and sustained RTW after injury.

McDonald et al. (2011) found that workers with arthritic back pain and fibromyalgia had significantly higher levels of work productivity loss than workers without musculoskeletal pain, even after adjusting for demographic and health characteristics.

Following an extensive evidence-based review of the literature on the relationship between musculoskeletal conditions and work, Waddell et al. (2003) concluded inter alia:

- Musculoskeletal symptoms, whatever their cause, may certainly make it harder to cope with the physical demands of work, but that does not *necessarily* (their italics) imply a causal relationship or indicate that work is causing (further) harm.
- Certain physical aspects of work are risk factors for the development of musculoskeletal symptoms. However, the effect sizes for physical factors alone are only modest and tend to be confined to intense exposures.
- Psychosocial factors (personal and occupational) exert a powerful influence on musculoskeletal symptoms and their consequences. They can act as powerful obstacles to work retention and return to work.

24.3 Models of Pain and Disability

Over the last two decades, there have been an increasing number of studies identifying prognostic factors for adverse outcome in low back pain (LBP), and there have been attempts also to investigate possible mechanisms linking risk factors and chronicity.

According to Schultz et al. (2007), research into occupational disability has been "largely hampered by lack of a clear definition of return to work" (p. 329), use of RTW both in consideration of process and outcome, and by differing concepts of occupational disability (derived, respectively, from biomedical, biopsychosocial, and social construction frameworks) which rely on differing research traditions, with differing relative emphases on individual versus system foci and, as a consequence, differing assumptions about the key determinants of RTW. As knowledge has increased, models have become increasingly integrative (and sometimes complex).

However, two models have been particularly influential. The Rochester model (Feuerstein 1991) was one of the earliest models explicitly implicating medical status, physical capabilities, specific psychological factors, and aspects of work (work demands) in a model of work disability. Although conceptual rather than statistically derived, it offered an important alternative to impairment models, which seemed to pay little regard to occupational factors or to the prevailing disability models, with their emphasis almost entirely on ergonomic or biomechanical factors.

Since then, an increasing number of factors have been implicated in work disability. The Sherbrooke model (Loisel et al. 2001; Loisel and Durand 2005) located the worker with musculoskeletal disability at the center of a four-part social framework, comprising personal factors, healthcare system factors, workplace factors, and societal economic factors, within which the challenges of work disability and RTW need to be understood.

A further advance is the inclusion of these various factors within stage or phased models of disability (Krause and Ragland 1994). Franche and Krause (2005) discuss facilitating the development of RTW strategies, which take into account the development of disability across time. However, we do not as yet have a single unifying biopsychosocial RTW model; Schultz et al. (2007) recommend both a number of components and a set of criteria if focused research into RTW is to be advanced.

24.4 The Determinants of Work Absence and Return to Work

Any such intervention strategy requires the identification of risk factors for adverse outcome, and the LBP epidemiological literature is replete with studies identifying prognostic factors of various sorts. Mallen et al. (2007) in a review of 45 studies identified a range of prognostic *clinical* indicators of poor outcome such as higher pain severity at baseline, higher baseline disability, greater movement restriction, longer pain duration, multiple-site pain, and previous pain episodes; *psychological* indicators such as anxiety and/or depression, higher somatic perceptions and/or distress, adverse coping strategies, and *sociodemographic* indicators such as low social support and older age.

Secondary prevention depends on the identification of risk factors for suboptimal outcomes, which are potentially modifiable, and a consistent relationship has been found between psychological factors and pain onset, as well as the transition from acute to chronic pain problems. Research has shown that psychological variables are important determinants of future pain and disability (Crook et al. 2002; Pincus et al. 2002; Shaw et al. 2001; Truchon and Fillion 2000), and there is accumulating evidence that psychosocial factors seem to be stronger predictors of outcome than biomedical or biomechanical factors (Burton et al. 1999; Crombez et al. 1999).

Over the last 15 years, there has been increasing interest specifically in potentially modifiable psychosocial risk factors, and the term "Yellow Flags" has become a familiar term used to describe psychosocial risk factors for chronicity. The primary focus of the original flag system (Kendall et al. 1997) was on clinical variables with a lesser emphasis on occupational factors. Main et al. (2005) have argued that, in these contexts, the term "Yellow Flags" should be reserved for more overtly psychological risk factors, whereas the social/environmental (workplace) risk factors could be divided into two categories: (1) workers' perceptions that their workplace is stressful, unsupportive, and excessively demanding, which they termed "Blue Flags," and (2) the more observable characteristics of the workplace and nature of the work, as well as the insurance and compensation system under which workplace injuries are managed, which they termed "Black Flags." More recently, Kendall et al. (2009) extended the term to encompass broader socioeconomic contexts outside of the control of the individual worker under which workplace injuries are managed (although their management recommendations are primarily aimed at the clinic and the workplace rather than at policy makers).

24.4.1 Influence of Yellow Flags on Outcomes

Leeuw et al. (2007) highlighted fear-avoidance beliefs, catastrophizing, avoidance behavior, distress, and pain behavior as being of importance in the development of pain, disability, and lowered performance. A number of studies/reviews have specifically investigated influences on occupational variables. Melloh et al. (2009) in a review of nine screening instruments found that work status was best predicted by fear-avoidance beliefs about work and the perceived chance of returning to work; functional limitations were best predicted by poor sleep and fear-avoidance beliefs; and pain was best predicted by baseline pain intensity, pain duration, and coping strategies. Depression and function were predictive of all three outcomes.

In addition to pain severity and level of depressive symptoms, Shaw et al. (2009a) also identified workplace factors such as job stress, coworker support, job dissatisfaction, employer attitudes, job autonomy, and availability of modified work as influences on duration of work disability and RTW outcomes. Their findings are consistent with an earlier more widespread review of predictors of chronic pain and disability (Waddell et al. 2003). It is sometimes difficult, however, to distinguish clinical outcomes, such as increase in activity or postural tolerance, from occupational variables, such as RTW rates or indices of work capability.

In a review by Sullivan et al. (2005), evidence was found for fear, beliefs in severity of health conditions, and catastrophizing as individual risk factors for long-term work disability. This was confirmed in a subsequent review by Iles et al. (2008) who identified expectation of recovery and fear avoidance as the most important psychosocial predictors of failure to RTW.

24.4.2 Influence of Blue Flags on Outcome

Even after controlling for a number of health, psychosocial, and demographic variables, characteristics of work and the work environment remain significant predictors of continued symptoms, functional capacity, and prolonged disability (Shaw et al. 2001). Steenstra et al. (2005), in a systematic review of seven prospective studies meeting stringent criteria, including only using studies with workers who had less than 6 weeks of sick leave, identified a range of prognostic factors for the duration of sick leave, including higher initial disability levels, specific LBP, older age, female gender, more social dysfunction, more social isolation, heavier work, and receiving higher compensation (i.e., a range of clinical and occupational features).

Shaw et al. (2009a) summarized findings from five recent systematic reviews of prognostic factors in which workplace factors had been specifically included. They concluded: “although not conclusive…. if all factors supported by at least one review are included, then the preliminary core set of workplace factors would include the following seven variables: heavy physical demands, ability to modify work, job stress, social support, job satisfaction, RTW expectation, and fear of re-injury” (p. 68). They observed further, that, “these variables suggest that occupational factors in back disability include physical and psychological demands, as well as social/managerial factors and worker perceptions and beliefs” (p. 68). Thus, evidence was found for both Yellow Flags (such as fear, belief in the severity of health conditions, catastrophizing, and poor problem solving) and for Blue Flags (such as low return to work expectancies and lack of confidence in performing work-related activities) as risk factors for long-term disability.

24.4.3 Some Observations on Yellow and Blue Flag Identification

A number of general observations are appropriate at this juncture. To begin with, according to

Nicholas et al. (2011), if modifiable risk factors are targeted specifically rather than indiscriminately, good outcomes are to be expected. In one of the few studies directly comparing prognostic factors for RTW, Steenstra et al. (2005) were able to explain 32 % of the variance in RTW using a combination of Yellow and Blue Flags. Workers at highest risk for delayed RTW: (1) expected to stay on sick leave for more than 10 days, (2) were being treated by a general practitioner or medical specialist, and (3) were unable to appear at the occupational physician's office and had a 10.8 times higher risk for delayed RTW. Similarly, the high-risk workers for *lasting* RTW as well as factors 1 and 2 for RTW also reported job stress as a cause of sick leave. Further, Shaw et al. (2009b) showed that flag identification per se does not necessarily change clinical focus and that even though clinicians may recognize the need for a more detailed assessment of patients with multiple psychosocial factors, increase in communication is focused on medical explanations and therapeutic regimen, not on lifestyle and psychosocial factors. Thus, flag identification must be linked with flag management. The assessment of Yellow and Blue Flags is detailed, respectively, in Nicholas et al. (2011) and Shaw et al. (2009a) but will also be discussed in the measurement of *presenteeism* (below), for which further validation work is required.

Recently, Gray et al. (2011) in their systematic review of Blue Flag assessment instruments for individuals with nonspecific low back pain identified six different questionnaires in eight studies (with a total recruitment of 5630 participants) but did not consider any of the instruments to be sufficiently validated to be able to recommend them. The only positive exception was the Obstacles to Return to Work Questionnaire or ORTWQ (Marhold et al. 2002), which, however, was still considered to be clinically unfeasible in its present format.

24.4.4 Influence of Black Flags on Outcome

Black Flags are not primarily a matter of perception and potentially affect all workers (Main et al. 2005). They include content-specific aspects of work which characterize certain types of job and which are associated with higher levels of illness. These features of work following injury may hinder or even prevent RTW. Examples include the physical and mental demands of the job, sickness entitlement with access to occupational health, policies of attendance and sickness management, management style, social climate, and specific RTW policies (such as the possibility of modified work or transitory work arrangements). Examples of wider contextual or "system" factors include nationally negotiated pay/conditions and employee entitlements (such as access to union representation and financial protection in the context of illness). Indeed, the influence of the financial rewards of work, financial protection in the context of illness and the net "costs" to the individual and the employer, and redress in the event of injury at work across countries and jurisdictions is well recognized (Waddell et al. 2002). For example, a major component in the genesis of extended claims in schemes like Workers' Compensation has been attributed to failures in the working of the system itself (Wickizer et al. 2001). MacEachen et al. (2010) identified the need for a "critical lens" to be applied to the entire organization of RTW.

In addressing the challenge of work disability, therefore, it is important to include consideration of Yellow, Blue, and Black Flags. In this context, some of the most important features of the work environment are described in the next section.

24.5 Influence of the Workplace

While acknowledging the aforementioned widespread contextual influences, in this chapter, the Black Flag focus primarily will be on the characteristics of the workplace which can influence successful and sustained reintegration into work.

24.5.1 Organizational Structure

According to Christensen et al. (2005), psychosocial factors at the workplace level may be important predictors of sickness absence. They found that after control for relevant confounders, low sickness absence was predicted by high workplace levels of decision authority in the technical services (rate ratio = 0.66, 95 % confidence interval = 0.51–0.86) and high workplace levels of skill discretion in the pharmaceutical company. Amick et al. (2000) criticized "one-dimensional" models of the determinants of disability and noted that in practice, organizational research had been conducted separately from employee-level research. They developed four scales: people-oriented culture, safety climate, ergonomic practices, and disability management, all of which predicted work status at 6 months and yielded odds ratios, adjusted for age, gender, and symptom severity of between 1.59 and 2.24. Although the study was on carpal tunnel syndrome, it is one of the few disability management initiatives to examine the influence of organizational factors on work disability using adequately validated assessment instruments.

Van den Heuvel et al. (2010) found that most long-standing health conditions were associated with productivity loss, but they also found that health-related factors were in general more strongly associated with sickness absence than low performance at work. Psychosocial factors such as job autonomy, job demands, and emotionally demanding work were more strongly associated with low performance at work than with sickness absence. The authors recommended the development of a healthy psychosocial climate at work.

24.5.2 Work Characteristics

Shaw et al. (2012) distinguished four different types of workplace risk factors for chronic disability: physical work demands, social climate at work, perceptions about health at work, and perceptions about workplace disability management. In terms of workplace physical demands, they found evidence for fast work pace, heavier physical demand, work demand exceeding work capacity, driving as the principal component of work, and the type of industry (private vs. public). However, it is not always clear whether objective characteristics of work or perceptions of work are being reported, and in one study in which both were specifically appraised, objective characteristics of work were relatively unimportant in the prediction of future performance (Wynne-Jones et al. 2011).

24.5.3 General Workplace Culture and Practice

There are many ways in which the nature of the general workplace and culture can be described and characterized. In the context of disability management in general and RTW in particular, however, the extent to which management is actively engaged in the RTW processes would appear to be of critical importance. This engagement, however, has to be supported by attendance and absence management policies, which facilitate reengagement in work (Main et al Chap.25 in this Handbook).

In a survey of manufacturing workplaces, lost-time frequency rates were associated *inter alia* with concrete demonstration by management of its concern for the workforce and greater involvement of workers in decision making (Shannon et al. 1996), a finding consistent with the importance of empowerment (Varekamp et al. 2006).

Several researchers have identified the importance of interdisciplinary communication and collaboration, both within and between organizations (Costa-Black et al. 2007; Feuerstein 1996; Loisel et al. 2005; Pransky et al. 2004). Indeed, after injury, there may be competing interests between the employer's need for business survival and success and the workers diminished work capability (Eakin and MacEachen 1998) and difficulties in procedures for complaining and frank challenge to the work-relatedness of injury, particularly evident in countries with adversarial tort legislation. Interestingly, Butler et al. (2007) found that workers' RTW was more responsive to satisfaction with how their firm treated their disability claim than satisfaction with their healthcare provider.

According to Shaw et al. (2009a), workplace factors meriting screening include the following: unsupportive or unhappy work environment, negative experience of workplace and management, and absence of interest from the employer. MacEachen et al. (2006) identified the importance of goodwill and trust. Finally, Brouwer et al. (2009), in a prospective longitudinal cohort study, found social support to be a significant independent predictor of RTW after long-term absence, and, indeed, many studies have found the relationship between the worker and his/her manager to be of importance. Interestingly, Mielenz et al. (2008) found that in RTW, coworker social support was more important than manager support or task satisfaction.

24.5.3.1 Attendance Management Policies

Absence management is an integral part of the RTW process. Any employer has to have in place systems for recording and managing attendance. It is obviously desirable to retain staff absent with long-term sickness in order to keep specialist skills, maximize investment in training, avoid costs of recruiting and training new staff, and circumvent the shortage of new recruits.

Nice and Thornton (2004) conducted an employers' survey as part of the background to the UK Job Retention and Rehabilitation Pilot (JRRP) scheme. Employers perceived sickness absence to be a problem because of the following factors: difficulties in covering absences, staff overload and stress, costs, productivity and profitability effects, and customer service effects. They wrote: "among managers there was some lack of sympathy towards days off for 'minor' complaints and suspicions that short-term absences were not always 'genuine'" (p. 11). This issue created some tensions with human resources (HR) staff that wanted to avoid a disciplinary approach. The summary is as follows:

> In practice, the approach to managing short-term absence was typically non-interventionist. While it was widespread practice for the employee to make contact on the first day of absence, only one employer in the study was proactive at this point in that they offered occupational health advice for selected conditions. There was rather little evidence of active management of sickness absence in the first two to three weeks…Return to work interviews, or less formal discussions, were almost universal, but sometimes cursory.… Although it was sometimes recognized that repeated short spells of absence, like occasional days off, could be the precursor to prolonged sickness absence, there was a tendency for them to be seen as suspect. (p. 13)

There appeared to be a number of ways in which responsibility for sickness absence was organized:

- Prime responsibility with departmental or line managers, common in public sector organizations
- Shared between line managers and human resource managers
- Led by human resource managers
- Led by the occupational health department, in one organization
- Shared by human resources, occupational health nurse, and line managers

Some problems were associated with leaving responsibility to managers: other pressures on their time, limited knowledge or skills, and inconsistent treatment. Backup from human resources included more proactive advice and, in large companies, central telephone-based help teams (Nice and Thornton 2004, p. 14).

There was difficulty dealing with uncertain duration of absence, particularly for mental health conditions, and managers had some skepticism about "stress-related" conditions. In general, for working conditions faced by the employees and the workplace, employers showed willingness to examine and adapt. Modifications included lowering or changing work hours and tasks completed, phasing a return to work, redeployment to other permanent or temporary work, and equipment and work modification. This was to give the wider message to staff and job applicants that they were valued (Nice and Thornton 2004).

However, it might be argued that in practice, absence management is more about attendance than ill health. Attendance management policies that aim at decreasing observed sickness *absenteeism* can easily trigger an increase in presenteeism (Bockerman and Laukkanen 2010) especially among those workers with chronic illnesses (Munir et al. 2008). According to Simpson

(1998), dysfunctional competitive presenteeism constitutes an extreme example of harmful competitive culture at workplaces. Optimal management of absenteeism and presenteeism is a central component of any RTW strategy, and, as already noted, the ways in which absence is managed can be an important obstacle to RTW.

24.6 The Evaluation of Interventions

24.6.1 Methodological Challenges

Durand et al. (2007), following a review of studies of workplace interventions, found marked heterogeneity in the content of interventions and in the diversity of reported actions, even in fairly specific initiatives such as the provision of modified work. However, they found general support in the literature for modifications to the form or nature of work as a means of hastening RTW. The group identified three general objectives: (1) enhancing individuals' work capability, (2) providing temporary transitional arrangements, such as phased RTW, and (3) provision/implementation of sustainable modifications in the workplace. Nonetheless, they found that in the studies, it was often not possible to establish explicit links between the objectives of the workplace intervention and the activities carried out and the proposed process outcomes.

There are also difficulties in the design and implementation of research. Linton et al. (2005) highlight some of the research challenges in evaluating outcomes, including the ambiguity of time to RTW as an outcome indicator, the importance of population definition, the difficulties in measurement, and the challenges of translating research into practice. Even when effectiveness for an intervention is found, interpretation of findings can be problematic.

24.6.2 The Challenge of Measurement

The principal challenge in evaluation of work compromise is the extent to which work productivity is compromised, most clearly evident in work absence, but also in the adverse effects of symptoms on performance in those at work (referred to as presenteeism), whether prior to sickness absence as possible precursors of absence or in the continuing impact of symptoms following RTW after injury or illness.

Hansen and Andersen (2008) found that more than 70 % of the core workforce goes ill to work at least once during a 12-month period, indicating that presenteeism was just as prevalent a phenomenon as sickness absence. Overall, work-related factors seem to be slightly more important than personal circumstances or attitudes in determining people's "decision" to go to work while ill. However, the relatively low explanatory power of these combined factors suggests that there are still many unknowns in this field of research.

According to Dagenais et al. (2008), indirect costs resulting from lost work productivity represented a majority of overall costs associated with LBP, and, according to Wenig et al. (2009), the majority of costs are work-related rather than direct healthcare costs.

Pransky et al. (2002) found that 1 year after injury, 68 % still had pain exacerbated by work, 47 % worried that their condition would worsen with continued work, and re-injury occurred in 42 % of the respondents. Importantly, the work-related outcome measures were largely independent of each other, and exploratory multivariate analyses demonstrated unique patterns of factors associated with each outcome. Thus, simply measuring return to work did not appear to capture the full range of job-related consequences from occupational back injuries.

According to Schwartz and Riedel (2010), the measurement of productivity can be conceptually separated into three interrelated categories: (1) *descriptive* measurement determining the degree to which health status affects worker performance, (2) *comparative* measurement offering an assessment of the differential effect that various health risks and chronic conditions or combinations of risks and conditions have on performance, and (3) *evaluative* measurement assessing change over time, particularly as part of program evaluation. It is through a combination of these functions that employers can begin to determine the magnitude of the problem and evaluate the effect of targeted solutions.

Kessler et al. (2004) investigated the methodological issues involved in evaluating the indirect costs of illness. They identified three types of data gap in information available to employers: impact of untreated health problems, magnitude of impact of illness, and lack of transformation rules needed to estimate the actual costs of change in workplace functioning. Absenteeism was often measured with a single question, but in the Health Performance Questionnaire (HPQ) (Kessler et al.,2003) there is assessment not only about days but also hours of work: expected hours of work missed on workdays, extra hours to make up for sickness absence, and total hours absent for any reason (work and nonwork related). Presenteeism presented a greater measurement challenge. Although questions or observations tailored to a specific task in a particular setting would be ideal, a broader measure is needed across diverse occupations and populations.

Finally, Koopman et al. (2011) observed that individual work performance is differently conceptualized and operationalized in different disciplines. In their systematic review, they identified a total of 17 generic frameworks (applying across occupations) and 18 job-specific frameworks (applying to specific occupations). Dimensions frequently used to describe individual work performance were task performance, contextual performance, counterproductive work behavior, and adaptive performance. They proposed a heuristic conceptual framework, in which an individual is understood in terms of the four core dimensions, for each of which a number of indicators are identified, yielding a theoretical basis for future research and practice.

24.6.3 Assessment of Productivity Loss (Absenteeism and Presenteeism) in the Individual Worker

Sickness absence is sometimes collected routinely (usually for payroll or attendance monitoring) but often in research studies is obtained by self-report, which becomes increasingly unreliable beyond 2 months (Severens et al. 2000). Dasinger et al. (1999) observed a sevenfold difference between administrative and self-report data (with higher disability estimated in self-reports), so ideally both types of information should be collected. Hensing et al. (1998) recommended the use of the following measures: frequency of sick leave, length of absence (based on individual), incidence rate, cumulative incidence, and duration of absence (spells).

The measurement of health-related suboptimal performance or presenteeism seems to represent an even bigger measurement challenge. The need for a general way to measure presenteeism across many types of jobs has led to the development of a plethora of self-report workplace productivity measurement instruments, such as the Work Limitations Questionnaire or WLQ (Lerner et al. 2001, 2003), the Work Productivity Short Inventory or WPSI (Goetzel et al. 2003; Ozminkowski et al. 2003), the Stanford Presenteeism Scale or SPS (Koopman et al. 2002; Turpin et al. 2004), with its subsequent short forms, and the Work and Health Interview or WHI (Stewart et al. 2004). The scales have undergone various levels of validity and reliability testing and displayed some level of criterion validity and reliability. Furthermore, a subset of the WLQ has been incorporated into a worksite health risk appraisal (HRA) with success in the study of a variety of health conditions (Burton et al. 2004) and health risks (Burton et al. 2005, 2006).

Turpin et al. (2004, ibid) reported the reliability and validity of the 13-item Stanford Presenteeism Scale (SPS) (Lynch and Riedel 2001) in knowledge-based and production-based workers, comparing it with the SPS, Short Form-36 (SF-36), and the Work Limitations Questionnaire (Lerner et al. 2001). They found it to have adequate reliability (alpha—0.83). Factor analysis identified two underlying factors: completing work and avoiding distraction, with knowledge-based workers load on completing work being $\alpha = 0.97$, whereas production-based workers load on avoiding distraction being $\alpha = 0.98$. There were significant and positive relationships between the SPS, SF-36, and Work

Limitations Questionnaire. They concluded that the SPS demonstrated a high degree of reliability and validity and recommended its use by employers who seek a single scale to measure health-related productivity in a diverse employee population.

Sanderson et al. (2007), in a prospective study, investigated the association of four separate measures of presenteeism (presenteeism days, inefficiency days, WLQ, and SPS) with a measure of anxiety and depression on a patient health questionnaire (Kroenke et al. 2001; Lowe et al. 2004). Only the Work Limitations Questionnaire consistently showed worse productivity as depression severity increased and sensitivity to remission and onset of depression/anxiety over the 6 month follow-up ($N=231$). They also found some evidence of individual depressive symptoms having a differential association with different types of job demands.

Prasad et al. (2004), following a major review of six generic instruments, found variation in psychometric strength and generalizability and considered that further research was needed to assess the accuracy and usefulness of individual instruments. Several other reviews have also examined their merits and the advantages of one instrument over another (Allen and Bunn 2003; Lofland et al. 2004; Ozminkowski et al. 2004), but one of the most informative reviews has been that of Mattke et al. (2007) who reviewed 17 different instruments purporting to measure or monitor health-related productivity loss, essentially absenteeism and presenteeism, based on employees' self-reporting. They considered that absenteeism on the basis of self-report was reliable and valid, provided the recall periods were short (i.e., 1–2 weeks), but recommended caution in reliance on results for recall over longer periods. The instruments varied substantially in length (3–44 items) and in scope with some addressing only specific conditions and incorporating several estimates for the cost of lost work time. They identified three modes of conceiving presenteeism: (1) assessment of perceived impairment; (2) comparative productivity, performance, and efficiency (with others and with norms); and (3) estimation of unproductive time at work. The authors identified several methods designed to estimate the effect of productivity loss on cost but considered that none of them were sufficiently developed or validated.

Kessler et al. (2004) considered that none of these instruments were sufficiently representative to enable overall comparisons and recognized that devising an overall scoring system working equally well across workforces and workers constituted a major challenge. They developed the Health Performance Questionnaire or HPQ (Kessler et al. 2003), described as a brief self-report questionnaire designed to elicit information for screening purposes and basic demographics, but also to evaluate the impact of health on three types of workplace impact: sickness absence, presenteeism, and critical incidents, with a view to evaluating the indirect workplace costs of illness. The HPQ therefore adopted a simple global rating approach based on a 0–10 rating on a single item. Considerable further details on validation, methodology, utility, and suggestions for further contextualization of the HPQ are presented in the two articles.

After reviewing the literature on various measurement instruments, Schultz and Edington (2007) observed that two presenteeism instruments were moving to the forefront in popularity, namely, the WLQ and the HPQ. They considered that their relatively strong validity and reliability make them good choices, particularly since they have been used in a variety of workplace settings and with a variety of health risks and conditions. Many of the other questionnaires reviewed here are suitable for specific patient populations, but the WLQ and the HPQ may be the most useful in general employee populations, and, further, they both give results that may be quantified monetarily.

Zhang et al. (2010), in a direct comparison of the four major measurement instruments, found that the estimates both of work-related productivity loss in the previous 2 weeks and the cost of presenteeism varied significantly depending on the instrument used, with estimates ranging from 1.6 to 14.2 h and with costs of associated productivity loss (i.e., presenteeism) varying by a factor of almost 10. Variations were also found in the strength of the associations among lost productivity, functional disability, pain, and arthritis.

Measurement instruments have also been used as a basis for cost. Lofland et al. (2004) reviewed several productivity loss instruments. Their review focused on six instruments that provided a metric suitable for conversion to a monetary figure. They found that many instruments are only suitable for use with certain patient groups, such as those with migraines. Others are applicable to broader populations that may have a variety of health conditions.

Finally, according to Brooks et al. (2010), many aspects of measurement still warrant caution, especially when using presenteeism measurements to quantify economic outcomes. They identified a number of fundamental questions:

1. Is there a "best" way of measuring presenteeism?
2. Do all instruments actually measure the same quality?
3. Do the majority or only a minority of employees experience presenteeism?
4. Can more instruments be validated against objective measures of productivity?
5. Why are there so few cross-correlated studies comparing two different presenteeism questionnaires in the same population?
6. Can the construct of presenteeism adequately accommodate the wide variety of job types?
7. Current instruments rely on a short recall period with results frequently extrapolated to give a yearly prevalence of presenteeism.

24.6.4 The Importance of Work-Related Outcomes

According to Elfering (2006), work-related outcome measures are essential indices within evidence-based medicine, and four different dimensions of work-related outcome are distinguished: occupational status, sickness absence, work ability, and work-related expectations and evaluations that may become obstacles to recovery (note: sickness absence has already been discussed).

24.6.4.1 Occupational Status

There are several ways and contexts in which occupational status is appraised both in terms of the type of job and in terms of working status pre- and post-injury. However, in order to maximize an instrument's sensitivity, a specific focus for use as a treatment-related outcome variable is required (Dionne et al. 1999).

24.6.4.2 Work Ability

Although a measure of *disability* rather than *ability*, the Roland and Morris Disability Questionnaire or RMDQ (Roland and Morris 1983) is one of the most commonly used measures; however, it has no questions directly relating to work. The modified 16-item version of the questionnaire includes two items from the Sickness Index Profile or SIP that refer to disability at work, and a separate analysis of these items is recommended when these instruments are the only work-related outcome measures (Dionne et al. 1999). The Work Ability Index (Ilmarinen 2007), comprising a 7-item rating scale, administered by an occupational health professional and yielding a score based on the worker's estimate of present and future work capability, is popular in Scandinavia. It is simple to use and has intuitive appeal, and yet surprisingly little research has as yet emerged on its utility. It merits further consideration.

The concept of work ability is linked with the enhancement of well-being, and according to Schulte and Vainio (2010), "the key to maintaining the effective functioning of the workforce is the concept of well-being, which encompasses more than just one's state of health, it is also a reflection of satisfaction with one's work and life" (p. 422).

Elfering (2006) concluded that most common measures of work-related outcome, i.e., global work status and RTW measures, lack specificity. It follows that in considering RTW after treatment for spinal disorder that work-related outcome should be adjusted against prior sick leave history. Measurement of traditional indicators including work status and RTW should be improved and, wherever possible, multiple data sources ought to be used. Furthermore, biomechanical and psychosocial work factors that are risk factors can also function as work-related outcome variables because they can be expected to predict major outcome variables, such as recurrent episodes or maintenance of disability.

During and after treatment, work-related attitudes are important work-related outcome measures. The influence of social context and perception of work colleagues and supervisors regarding their status of sickness absence and RTW expectations are potentially underestimated as important factors for early RTW.

24.6.5 Assessment of Workplace Policies and Practices

According to Tang et al. (2011), the importance specifically of workplace organizational policies and practices (OPPs) in promoting worker safety and effective disability management is increasingly recognized, and factors such as early communication between injured workers and workplace stakeholders and the promotion of a people-oriented work culture have shown to be important not only in preventing new injuries but also in facilitating work reintegration for injured workers (Shannon et al. 2001).

Habek et al. (1991) produced a 95-item OPP questionnaire from which a 20-item scale was later produced (Amick et al. 2000) comprising four major dimensions: *safety practices*, *ergonomic practices*, *disability management*, and *people-oriented culture* as the structure of the scale. It has been used as the basis for development of the OPP-11 (Amick et al. 2004; Katz et al. 2005). Further evidence of its predictive ability in relation to work outcomes is provided by Tang et al. (2011). Although the validation work was undertaken primarily for upper-limb symptoms, the four domains appear to be a helpful way of clustering organizational policies and practices; however, specific recommendations for the mediation of jobs or ergonomic adjustments would need to include a condition-specific component.

24.7 Conclusions

In this chapter, it has been suggested that the problem of work disability in people with musculoskeletal disorders, as evidenced in the problems of RTW, merits a fundamental reconsideration. The shift in focus in clinical medicine toward patient-centered healthcare and secondary prevention is paralleled by the shift in focus in occupational medicine from ergonomics, biomechanics, and disability toward the psychosocial aspects of work and the nature of the workplace, with its influence on the determinants of reengagement in work after illness or injury. Effective interventions require a foundation of careful identification and evaluation of obstacles to recovery and reengagement. There is a strong evidence-based consensus on the need for consideration both of the worker and the working environment. An important challenge in the design and evaluation of interventions has been the lack of adequately developed and validated measurement tools. Poor conceptualization, weak methodology, and overreliance on measurement tools designed in earlier eras have hindered progress in understanding the processes involved in developing, implementing, and evaluating successful interventions. Methodological shortcomings are evident in attempts to develop all-purpose measurement instruments and in the failure to differentiate the requirements for prognostic screening, treatment targeting, measurement of change, and evaluation of outcome. Measurement does not necessarily need to be complex, but it must be relevant, clearly focused, and feasible. Further comparative studies are needed of the construct validity, reliability, and specific utility of the instruments currently available in the specific occupational contexts in which they are intended to be used, but it is likely that new instruments need to be considered in conjunction with the design and development of new types of intervention more clearly focused on determinants of behavior change (these are discussed in the companion chapter).

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25 Towards an Approach to Return to Work Interventions in Musculoskeletal Disorders

Chris J. Main, William S. Shaw, and Jennifer Mitchell

25.1 Introduction

The costs of musculoskeletal disorders to sufferers, to health-care systems, and to employers have been long recognized and have been widely documented. Given the plethora of treatments available, this is perhaps surprising. Although the reasons are undoubtedly multifactorial, the continued high cost of health-related work loss mandates reexamination of some of the assumptions underlying service provision. Clinical interventions for musculoskeletal disorders, such as back pain, based on concepts of injury, structural compromise, and ergonomic challenge, derive from illness/disability models developed around the beginning of the last century, and can be broadly categorized as surgical, biomechanical, or pharmacological. Occupational medicine has tended to focus primarily on the relationship between physical challenge and injury. This has led, appropriately, to a focus on injury prevention rather than the persistence of pain-associated work compromise. It has been assumed that the predictors of persistent symptoms and prolonged disability are primarily biomechanical or ergonomic and services have been configured accordingly. Prognostic research has however highlighted the influence of psychosocial predictors on outcome and stimulated the development of multifaceted, usually multidisciplinary, approaches to pain rehabilitation, in those people in whom pain has become chronically incapacitating.

Analyses of the influence on occupational as opposed to clinical outcomes have in broad terms confirmed the importance of psychosocial factors on outcome (frequently appraised in terms of absenteeism and return to work (RTW) rates). In occupational rehabilitation however the role of the workplace becomes of heightened importance, both in terms of the physical/mental demands of work and in terms of the psychosocial impact of the way in which work disability is managed. Policies and practices developed for purposes of attendance management are not well suited to the management of pain-associated work compromise and may hinder rather than facilitate sustained RTW. It would seem appropriate therefore to review the evidence on the nature and efficacy of interventions as a prelude to consideration of a re-energized and possibly

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re-focused approach to the management of RTW in people with musculoskeletal disorders.

25.2 The Efficacy of Interventions

25.2.1 Primary Prevention

Although occupational disability traditionally has been considered a matter primarily for the workplace, the immediate sequelae of acute injury and early management of symptoms frequently calls to the health-care sector. There have been attempts to prevent the development of musculoskeletal disorders in the first place. Buchbinder et al. (2001) developed a multicomponent media campaign to successfully change beliefs about back pain at a population level, but change in beliefs does not necessarily lead to changes in work-related outcomes (Waddell et al. 2007) and it has been suggested that educational efforts need to be directed as the facilitation of behavior change rather than the provision of knowledge per se (Main and Burton 2012).

25.2.1.1 Primary Prevention in the Workplace

Primary prevention has an immediate public appeal but although there has been some success in the prevention of serious injury as a consequence of Health and Safety legislation, Dawson et al. (2007) found no strong evidence regarding efficacy of any interventions to prevent back pain and injury, moderate evidence that manual handling alone or stress management programs were NOT effective, and conflicting evidence regarding the efficacy of exercise and the provision of manual handling equipment or training.

Hill et al. (2007) concluded that although there was evidence that educational interventions for back pain and musculoskeletal disorders, designed to address an individual's beliefs and attitudes about that pain, were effective, interventions should also address employees' other attitudes and beliefs. Evidence was also found to suggest the importance of organizational policies and practices, and of employer tackling potential organizational barriers to promoting and maintaining health at work, and promoting recovery through work. The timely provision of modified duties was identified to be effective in managing back pain at work and in helping those with back pain to RTW.

25.2.2 Early Intervention and Secondary Prevention

The specific role of health-care providers in the RTW process varies across jurisdictions, but usually some sort of medical appraisal is required to sanction sick leave. According to Waddell et al. (2008), effective RTW needs to be addressed both from a health-care and an employer perspective. Many studies have found a relationship between duration of symptoms or chronicity outcome of interventions and RTW, but according to Bostrom et al. (2008), chronic symptoms are also associated with lower productivity. It would seem therefore that successful early intervention is an attractive option.

In the UK, the primary care physician (GP), as a "gatekeeper to benefits," has a pivotal role in the RTW process. Among GPs, there is some support for an active role in the rehabilitation process, although potential role conflicts were identified (Wynne-Jones et al. 2010a) and specific training needs were requested to implement this change in role (Wynne-Jones et al. 2010b). The identification of potentially modifiable risk factors is the first stage of any early/secondary intervention strategy, but there is often a lack of concordance between the risk identification and the actual interventions (Shaw et al. 2006).

Nicholas et al. (2011) identified 18 studies on acute/subacute low back pain (LBP), both work and non-work related, of which 11 studies demonstrated that targeting psychological risk factors resulted in better functional or RTW outcomes, while six studies did not. The degree of psychological expertise required in early musculoskeletal interventions requires further investigation. Main and George (2011) recommended the development of psychologically informed practice as a middle way between traditional biomedically based interventions and mental health interventions and indeed there is now evidence that such an approach delivered by physiotherapists trained to address psychosocial risk factors (Main et al. 2012) is superior to best practice of usual care (Hill et al. 2011). This approach has also been recommended for early clinical management of psychological factors by non-psychologists (Shaw et al. 2011; Sullivan et al. 2005b; Sullivan and Adams 2010).

There have been few published attempts to integrate the identification and management of occupational factors into the routine practice; however Shaw et al. (2011) recommended strategies that include (1) administration of self-report questionnaires to assess a client's perspective of physical job demands, (2) client-centered interviewing to highlight individual RTW concerns, (3) early discussions with clients about possible job modifications, and (4) incorporation of clients' workplace concerns in progress reports and summaries.

25.2.3 Specific Workplace Interventions

According to Pransky et al. (2005), there is wide variation in recommended strategies for RTW. Shaw et al. (2009a) identified four principal categories of workplace-focused interventions: (1) physical work simulation, (2) psychological (education and counselling), (3) organizational (e.g., employer support and communication), and (4) ergonomic (e.g., temporary job modifications). More details are provided in a summary table (ibid p. 70).

25.2.3.1 Educational

According to Main and Burton (2012), our educational focus needs to move beyond knowledge about the nature of LBP and its effects to how to minimize its impact with the development of appropriate self-management strategies. As a consequence, the role of education and advice needs to become less focused on provision of biomedical information to plug a knowledge deficit and more directed at illumination of ways in which to minimize the impact of LBP within a patient-centered approach (guided self-management). The role of the health-care practitioner becomes less of an educator and more of a coach. Such a re-focusing may be assisted by adopting a clearer behavioral focus on the determinants of behavior change and the identification of educational objectives (Main and Burton 2012).

25.2.3.2 Ergonomic

The evidence for the effectiveness or ergonomic interventions is mixed. In a systematic review of the effect of workplace ergonomic interventions, Tompa et al. (2010) found strong evidence in the manufacturing/warehousing sector, moderate evidence in administration and healthcare, and limited evidence in transportation but insufficient evidence to support them in other types of occupation.

Driessen et al. (2010b), however, did not find them to be generally effective and attributed these findings to failure of implementation. They recommended the adoption of participatory ergonomics (PE) as a specific implementation strategy. PE has already shown promising results in prevention of musculoskeletal disorders (MSDs) (Rivelis et al. 2008); however, the positive effects on MSD have not always been confirmed (Haukka et al. 2008). The process evaluation of a large cluster-randomized clinical trial (Driessen et al. 2008) revealed that only one-third of the proposed ergonomic measures had in fact been implemented in the intervention departments (Driessen et al. 2010c). Various factors can positively or negatively influence implementation and can be present at different levels (i.e., individual professional, worker, societal, or organizational) (Grol and Wensing 2004).

It would seem therefore that knowledge of the barriers and facilitators in different levels of occupational context is crucial to improve implementation, but such knowledge is lacking in most ergonomic intervention studies (St. Vincent et al. 2006). Driessen et al. (2010a) concluded that it was important to create an enthusiastic and sustainable working group supported by management and supplied with sufficient resources as part of the implementation strategy.

25.2.3.3 Workplace Accommodations

Typically, accommodation can include modified or altered duty, graded work exposure, work trials, work design, activity restrictions, reduced hours, or other efforts to temporarily reduce work demands (Brooker et al. 2001) and there is some evidence for workplace accommodation in the prevention of prolonged absences for workers with MSDs (Krause et al. 1998). Following an extensive review of the literature, Waddell et al. (2008, ibid) concluded that "there is strong evidence that temporary provision of modified work reduces the duration of sickness absence and increases return to work rates. It is often low-cost, and can be cost-effective" (p. 31).

Modified work has long been recognized as potentially helpful (Krause et al. 1998). Recently, Van Duijn and Burdorf (2008) showed that workers who performed modified work had a lower risk of recurrence of musculoskeletal sick leave than those who had returned directly to full duties. The precise mechanisms by which such arrangements facilitate RTW are not fully understood but it seems probable that psychological as well as physical factors are involved. Indeed, Abriola (2009) has suggested that transitional duty programs may help firms boost morale. Shaw et al. (2009a) recommended a three-step care approach that is discussed in the concluding section of this chapter.

25.2.4 Case Management

Successful interventions depend not only on the content of the intervention, but also on its overall management, particularly in the more difficult and challenging cases. Following a widespread literature review, Hanson et al. (2006) concluded that:

> There is good scientific evidence that case management methods are cost effective through reducing time off work and lost productivity, and reducing healthcare costs. There is even stronger evidence that best-practice rehabilitation approaches have the very important potential to significantly reduce the burden of long-term sickness absence due to MSDs. The combination of case management with suitable rehabilitation principles is currently being used effectively in multiple settings throughout the UK, and there is growth within the case management sector…It may be concluded there is moderate evidence that case management approaches are effective and can yield a variety of benefits which are cost effective (pp. vii–ix).

25.3 Integrated Return-to-Work Programs

Although many interventions are commissioned and delivered by a health-care practitioner on a one-to-one basis, it is becoming increasingly apparent that more complex and intense interventions are often required to get people successfully back to work. These can vary considerably in content, complexity, and organization but have a common principal focus of RTW. (In the UK, these are sometimes referred to as Vocational Rehabilitation Programs, a term which is used somewhat differently in the USA to refer more to the process of preparing for employment.)

According to Bose (2008), a key objective of an RTW program is to facilitate return to employment as soon as possible, thereby helping an injured person regain a sense of importance and worthiness; key corporate elements include (1) early injury and illness management, (2) accident prevention, (3) active safety program, (4) ongoing review of workplace design and process, (5) proactive claims management, and (6) employee assistance and corporate wellness (ibid pp. 64–65). More specifically, an *active role* for management is advocated, with a "hands-on approach" including interacting with the physician and making work accommodations. Bose identifies a range of potential resources including work-hardening clinics, ergonomic consultation, occupational therapy, and occupational medicine.

Inspired by the Sherbrooke model (a system-based approach with clinical and occupational elements), Loisel et al. (1997) conducted a randomized clinical trial (RCT) on subacute work-related back pain comparing a clinical intervention, an occupational intervention, a combined intervention, and a (usual care) control group. Only the combined approach was superior to the usual care approach in terms of faster RTW. Whitfill et al. (2010) however found that the addition of a work transition component conferred no significant additional benefit to a biopsychosocial early treatment approach to the management of acute LBP in terms of work outcomes. Nonetheless, although the Sherbrooke model (Loisel et al. 1997) has been particularly influential, there is considerable variation in the objectives of the workplace component and is often inadequately documented. What then is known?

Briand et al. (2008) integrated the findings from a number of reviews of RTW interventions for workers absent with musculoskeletal disorders and grouped the components into three main categories: personal interventions, work environmental interventions, and interventions focused on interactions among stakeholders. The *personal interventions* included knowledge conditioning, physical conditioning, psychological conditioning, and occupational conditioning; and the *work environmental interventions* included workplace interventions *and* organizational interventions. On the basis of their review, they concluded that the essential components were:

- Centralized coordination of RTW
- Formal individual psychological and occupational interventions
- Workplace-based interventions
- Work accommodations
- Contact among various stakeholders and interventions to foster concerted action

In fact, of the 11 programs identified in the study, 5 were designed for clients in a subacute phase, 5 were designed for clients in a chronic phase, and only 2 were designed to address both client groups with a fully integrated multidimensional perspective.

25.3.1 The Scope of Return-to-Work Programs: Illustrative Examples

There are many case examples of RTW initiatives in the grey (nonscientific) literature, such as commissioned reports and policy documents. Five types of RTW programs are illustrated in the following examples.

25.3.1.1 A Preventative Approach with Absence Management

Waddell et al. (2008) developed and implemented a company-wide absence management policy and effective sickness absence management program at Rolls Royce (HSE 2005). All staffs were trained on the new policies and procedures, explaining the responsibilities of managers, human resources, and occupational health advisors. A computer-based program was introduced that monitors employee absence, records the reasons for the absence, and calculates costs. Early rehabilitation was provided to anyone who was absent for 4+ weeks, including an action plan and physiotherapy services (for both work- and non-work-related injuries). The initiative inter alia led to a drop in the proportion of staff absence due to stress and fewer staff days absent due to illness. The reduction in staff absence from an average of 2.9 % (1999) to 2.4 % (2002) of the workforce saved the company approximately £11 million.

25.3.1.2 A Job Placement Program

According to Li-Tsang et al. (2008), a 3-week job placement program, comprised of an individual interview, vocational counselling, job preparation training, and case management, led to a significantly higher RTW rate with a higher level of work readiness and emotional status in coping with work injuries than self-placement appointment with a social worker.

25.3.1.3 A Functional Restoration Approach

The Health and Safety Executive (HSE 2012) reported a 24-month initiative by the Royal Mail who introduced a biopsychosocial Functional Restoration Program (FRP) to help employees with chronic long-term and recurrent musculoskeletal conditions to RTW and normal function. 67 % of those who were off work and 73 % of those on restricted duties returned to full duties. The financial benefits of the program to the employer were substantial with costs of absence reducing from £1,384,501 to £127,738 for the study group and provided a return of approximately £5 for every £1 invested in the program.

25.3.1.4 A Staged Approach

Ammondolia et al. (2009) detailed a five-step RTW program using intervention mapping (mentioned further below) consisting of a four-step plan beginning with a needs assessment, developing program objectives, developing theoretical methods and practical strategies, and finally designing the workplace intervention program with the identification of performance objectives, focusing attitudes/beliefs/emotions, knowledge, and skills/self-efficacy with declared expected outcomes.

25.3.1.5 A Comprehensive Strategic Approach to Return to Work

Waddell et al. (2008, p. 257) also report an integrated strategy developed at British Telecom described as the "B.T. People Strategy." There are three steps to the consideration of health and safety—primary engagement, secondary intervention (formerly prevention), and tertiary restitution (formerly rehabilitation) with line managers keeping in regular contact with workers on sickness absence to remind them that they are part of the work community with the ability to arrange practical interventions to support RTW (e.g., flexibility for home working, funding transport to work). In 5 years, the scheme has reduced sickness absence by about 1/3; mostly, this has occurred by reducing long-term absence rather than sporadic short-term absences. The largest drop has been in absence due to musculoskeletal conditions, which was previously the largest cause. The highest proportion of absence is now due to mental health problems.

25.4 Principles, Processes, and Practices Underpinning Successful Interventions

25.4.1 Principles

So is there any sort of consensus as to how to approach RTW? The Institute for Work and Health (IWH 2007) synthesized the findings of a number of reviews and research studies focusing on three outcomes (duration of work disability, costs of work disability, and quality of life of workers) and found a positive impact for workplace-based RTW interventions for duration and costs, but less so for quality of life. The results are presented in Table 25.1 below.

Table 25.1 Seven "principles" for successful return to work

Principle no.	Principle
1	The workplace has a strong commitment to health and safety, which is demonstrated by the behavior of the workplace parties
2	The employer makes an offer of modified work (also known as work accommodation) to injured/ill workers so that they can return early and safely to work activities suitable to their abilities
3	RTW planners ensure that the plan supports the returning worker without disadvantaging coworkers and supervisors
4	Supervisors are trained in work disability prevention and included in RTW planning
5	The employer makes an early and considerate contact with ill/injured workers
6	Someone has the responsibility to coordinate RTW
7	Employers and health-care providers communicate with each other about the workplace demands as needed, and with the worker's consent

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Interesting evidence from both quantitative and qualitative studies is provided in support for these recommendations. The authors observe *inter alia* that the "planning must acknowledge RTW as a *fragile social process* where coworkers and supervisors may be thrust into new routines" (p. 3).

25.4.2 Processes

James et al. (2006) identified seven key processes/practices central to the provision of effective support to ill, injured, and disabled workers:

- Speedy identification of workers whose attendance or more general job performance is being adversely affected by their conditions.
- Action to aid the job retention of workers by making provision for workers to have access to "medical" treatment, and providing other forms of support, including any necessary re-training and adjustments to work processes and environments.
- Put in place adequate mechanisms to facilitate communication, discussion, and cooperation.

- Provision of access to worker representation as a means of ensuring that rehabilitation occurs in an atmosphere of openness and trust.
- Establishment of policy frameworks, which clearly detail not only what can and should be done, but also make clear who is responsible and accountable for implementing their requirements.
- Systematic actions to ensure that the laid-down policy frameworks are implemented properly and hence do, in practice, influence how particular cases are handled.
- Create mechanisms to monitor the operation and effectiveness of established rehabilitation procedures with a view to identifying and addressing any weaknesses in them (pp. 292–293).

They also identified a number of specific factors, including both organizational and wider contextual factors, which can potentially help or hinder the rehabilitative process. They concluded that "the provision of rehabilitative support by employees is crucially influenced by the establishment and effective implementation of policy frameworks which enable the rehabilitative needs of workers to be identified in a timely and collaborative fashion and to be addressed in a coordinated and positive way" (p. 297).

25.4.3 Practices

Following a systematic review of 53 studies of injury/illness prevention and loss control programs (IPCs), Brewer et al. (2007) concluded:

1. There is strong evidence supporting the effectiveness of disability management/RTW programs—the authors recommended the development of multicomponent disability management programs, using an approach that involves the health-care provider, company supervisors and workers, and workers' compensation carriers.
2. There is a moderate level of evidence that supervisor practices, workstation adjustments, and exercise have a positive effect on reducing injuries/illnesses. Workstation adjustment or ergonomic training alone has no effect on reducing injuries/illnesses.
3. There has long been agreement in principle on the need to involve all key stakeholders.
4. The key to good absence management is commitment from senior management and having the right policies in place. Where senior managers had primary responsibility for absence management, absence rates averaged nearly a day lower.

There were also lower absence rates where Human Resources managers had primary responsibility. However, in 71 % of organizations, line managers had the day-to-day responsibility for absence management. Employers typically took action after 10 days or three spells of sickness absence, but the best performing organizations triggered their absence management policies earlier.

Franche et al. (2005b), in a systematic review of workplace-based RTW interventions, concluded that the evidence base supports the notion that workplace-based RTW interventions can reduce work disability duration and associated costs; however, the evidence regarding their impact on quality-of-life outcomes was much weaker.

25.5 Content, Timing, and Cost-Effectiveness

There are many individual studies and a number of reviews reporting outcomes from RTW/rehabilitation programs. The conclusions of two of them are reported here. According to Hanson et al. (2006):

1. There is strong evidence that rehabilitation programs using a cognitive-behavioral orientation and an activity focus are effective, and cost effective, at reducing pain and increasing productive activity in both subacute and chronic groups.
2. There is also strong evidence that the use of these interventions at the subacute stage can

prevent the development of long-term problems and reduce time off work.

3. Furthermore, there is good evidence that this is highly cost effective, especially when the intervention is selectively delivered to individuals screened as having a high risk for a poor outcome (pp. ix–x).

They concluded that the key components of good-quality rehabilitation service delivery contain the following:

- An effective method to identify suitable cases with a standardized screening process.
- Consideration given to the timing of the intervention: not too early and not too late.
- Interventions are individualized by targeting specific obstacles to recovery/RTW.
- The role of the case manager is integrated with the intervention through an agreed individualized rehabilitation plan.

The content of the intervention described by Hanson et al. (2006) is expected to be:

- Focused on RTW
- Cognitive-behavioral in orientation (with a problem-solving approach)
- Activity based
- Integrated with the workplace
- Based on evidence-based protocols (p. x)

Hanson et al. (2006) also concluded that the literature provided strong evidence on the cost-effectiveness of the approach.

Finally, Waddell et al. (2008) produced a major review and evidence synthesis on vocational rehabilitation that included a specific focus on musculoskeletal disorders. Their conclusions are shown in Table 25.2.

Although the outcomes of RTW programs seem in general to be encouraging in the short term, less is known about the longer term effectiveness. In one study (Suoyrjo et al. 2009), improved occupational outcomes in terms of sickness absence were shown for vocationally oriented multidisciplinary intervention in comparison with controls. This was demonstrated for the intervention year and the three subsequent years, but the absence rates subsequently thereafter returned to the pre-intervention level. Clearer more long-term studies are required.

25.6 The Psychology of Engagement: Lessons from Organizational Development

Perspectives have broadened in the RTW field from attendance management to sickness management; a concomitant shift in emphasis from symptom management to the enhancement of well-being has occurred. It would seem therefore that facilitating engagement and re-engagement in work has the potential to assist those returning to work after illness or injury. The concept of engagement in work traditionally has not fallen within the purview of occupational health or the rehabilitation literature but merits consideration in the context of both the enhancement of well-being and pain management.

25.6.1 Engagement: What It Is and Why It Matters

McPherson (2007) linked employee engagement with discretionary effort and productivity within an overall framework of work-life balance, emphasizing that work-life balance must be supported and encouraged at all levels of the organization, including senior management, line managers, and all staffs.

Workers with musculoskeletal problems often struggle to maintain their pre-injury work capability and discretionary effort becomes beyond their reach. According to McLeod and Clarke (2009), engagement goes to the heart of the workplace relationship between employee and employer, can be a key to unlocking productivity, and correlates with a number of factors: better financial performance, better outcomes in the public sector, higher levels of innovation, a higher level of employee advocacy of their organization, lower rates of absenteeism, and higher employee well-being.

Table 25.2 Evidence synthesis from Waddell et al. (2008)

	Conclusions
1	There are good epidemiological and clinical reasons and widespread acceptance throughout the literature that early return to work and stay at work approaches are appropriate and beneficial for most people with most musculoskeletal disorders
2	***A common set of approaches for helping people return to work are effective across the range of musculoskeletal disorders/injuries
3	***There is strong evidence that occupational outcomes for most people with most musculoskeletal disorders are improved by (increasing) activity, including early return to (some) work
4	***Early intervention through delivery of appropriate treatment, positive advice/reassurance about activity and work, and/or workplace accommodation is sufficient for many people with musculoskeletal disorders; those who do not respond in a timely manner may require more structured vocational rehabilitation interventions
5	**Treatments to address any specific pathology and to reduce symptoms are integral to vocational rehabilitation, but treatment per se has little impact on occupational outcomes
6	**There is moderate evidence (and wide consensus) that vocational rehabilitation entails a number of elements, which must take account of the individual, their health condition, and their work; involvement of the workplace is crucial
7	***There is strong evidence that temporarily modified work (transitional work arrangements) can facilitate early return to work
8	***There is strong evidence that structured multidisciplinary rehabilitation programs, including cognitive-behavioral principles to tackle psychosocial issues, are effective for helping people with persistent musculoskeletal disorders return to work
9	***There is strong evidence that commitment and coordinated action from all the players are crucial for successful vocational rehabilitation: especially important is communication among health-care professionals, employers, and workers, which should be initiated at an early stage of absence
10	*There is general consensus and limited evidence that successful return to work requires the provision of consistent information and advice (including the correction of unhelpful beliefs and myths) for all the players
11	*There is limited evidence that (some aspects of) vocational rehabilitation for musculoskeletal disorders can be cost effective

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* weak evidence
** moderate evidence
*** strong evidence

Engagement however is enacted in a social context. According to Lawson et al. (2010), "multiple studies show that companies which invest in the social connection of their staff have lower turnover rates, higher satisfaction levels, and contribute more to revenue growth" (p. 4). Interestingly, financial reward did not appear on the list.

25.6.2 Performance Management

The importance of performance management now appears to be increasingly recognized. A recent commissioned survey (You.Gov 2011) challenged the assumption that line managers actively communicate with their employees and found *inter alia* that:

- Less than half of employees (44 %) feel that they receive helpful feedback from [their] line manager frequently enough.
- Only 44 % feel that they receive regular enough feedback from their line manager that helps them to do their job better.
- Only 44 %, considerably less than half feel that the performance standards on which their line manager is evaluating their performance have been communicated to them.

Feedback and setting clear standards and expectations are key elements of performance management. Of equal importance are issues such as understanding and focusing on strengths and helping to overcome weaknesses. The further results of the YouGov (2011) survey are equally concerning:

- Only 55 % of employees believe that their line manager genuinely understands their strengths.
- Finally, only 38 % feel that their line manager encourages them to talk about their strengths.

Performance reviews are generally considered to be desirable; however in a recent report by Wharton Business School (2011) it was noted that although performance reviews are undertaken by more than 90 % of organizations, they have a negative reputation. "Performance reviews typically are not done often enough and all too often are done poorly. A good performance review gives employees constructive, unbiased feedback on their work. A bad one demonstrates supervisor bias and undermines employee confidence and motivation" (p. 1). Performance appraisals can destroy the trust between the boss and the employee, and the report recommended the introduction of previews rather than reviews.

25.6.3 The Importance of Leadership and Line Management

There is need for involvement at the highest level (Boardman and Lyon 2006). However, leadership should permeate all levels of the organization. The CEO nonetheless is in a key position to facilitate the trickle down of policies and practices. Sutton (2010) identified three key features/functions of leadership in boosting work performance:

1. Provide psychological safety by creating a safety zone where people can talk about half-baked ideas, test them, and even make big mistakes without fear of ridicule, punishment, or ostracism.
2. Shield innovative people and eliminate needless meetings.
3. Make small gestures—e.g., taking time to express appreciation. "Conveying this attitude is especially crucial when the stench of failure fills the air … Unfortunately, too many bosses have the opposite response and use such occasions to point fingers, humiliate the guilty, and throw a few overboard" (p. 10).

According to a recent report, middle managers have a key role particularly in knowledge-intensive industries and they may have a greater impact on company performance than almost any other part of the organization and much larger than that of individual creative team members (Wharton Business School 2010). The authors estimate that managers accounted for 22.3 % of the variation in revenue among projects, as opposed to just over 7 % explained by innovators and 21.3 % explained by the organization itself. It is the role of individual managers to integrate and coordinate the innovative work of others. Thus, the best managers are able to work closely with the innovators to turn their ideas into realistic project plans, and they are effective at motivating the team and facilitating collective creativity.

25.6.4 The Employer-Employee Relationship

Lekhi and Blaug (2009) stress the importance of trust, the need for a contract that is perceived as fair, the importance of the degree of personal control and autonomy, and the need for a degree of stability and predictability. Furthermore, according to Sullivan et al. (2010), the deal on offer must be explicit, credible, and transparent—and the walk must match the talk. However, according to Wong et al. (2010) there may need to be a radical step change in the skill and attitudes of managers to enable greater autonomy and control in the workplace.

25.6.5 Positive Psychology, Organizational Behavior, and Employee Performance

In attempting a reconceptualization of the problem of work disability we have so far suggested two changes in emphasis: first, a shift from a biomedical/ergonomic viewpoint to that of a biopsychosocial understanding of disability, and second, a change in focus from symptom management to that of health and well-being. The third and final gear change is to offer an analysis of human performance as a facet of organizational behavior developed from an understanding of "positive psychology" and how it may be relevant as a framework within which to reestablish function and facilitate re-engagement. Notably, "Treatment is not just fixing what is broken, it is nurturing what is best" (Seligman and Csikszentmihalyi 2000 p. 7).

Over the last decade there has been an increasing interest in *positive organizational behavior* (*POB*) which has been defined as "the study and application of positively oriented human resource strengths and psychological capacities which can be measured, developed and effectively managed for performance improvement" (Luthans 2002, p. 59). The derived capacities include core constructs such as self-efficacy, hope, optimism, and resilience, well-recognized aspects of psychologically oriented pain management, collectively referred to as *psychological capital* (PsyCap) which has in turn been linked with performance enhancement (Avey et al. 2006; Luthans et al. 2007; Stajkovic and Luthans 1998) and based on core confidence. Avey et al. (2010), using the Psychological Capital Questionnaire (Luthans et al. 2007), found that PsyCap was related to both demonstrated manager-related performance and objective performance outcomes.

Finally, Luthans et al. (2008) reported the results of three studies in which they investigated PsyCap as a possible mediator of the organizational climate-performance relationship. They found support for previous research demonstrating PsyCap as an important mediating link between supportive organizational climate and employee performance, and concluded that PsyCap seems to have influence at various levels within organizations.

The challenge of work disability and analyses of organizational processes may seem far apart. However, in attempting to move towards work ability and the enhancement of well-being, in the context of ongoing symptoms, it is perhaps now time to consider how the lessons from the psychology of engagement might assist the psychology of re-engagement, both at an individual and an organizational level, as part of the RTW process.

25.7 New Approaches to Intervention Design

The multifaceted nature of work disability offers a real research challenge, and it is perhaps now time to consider, following Linton et al. (2005) and Schultz et al. (2007), how we might grasp the challenge of developing new more systematic approaches to intervention. An example is offered about how this might be done.

25.7.1 Stage 1: Design and Development of the Intervention

As previously mentioned, Franche et al. (2005a) recommended optimization of the role of stakeholders in implementation and research and how this might be achieved, primarily as a way of resolving conflicts. However, this is a "Black Flag solution" and can be seen as an example of the new science of participatory research which has been applied in a number of fields (Anema et al. 2003). Barreteau et al. (2010) specifically attempted to accommodate inputs from the relevant stakeholders to obtain relevant research outcomes. The reported framework has three facets: (1) the flows of information among participants and the control of these flows over each step in a process, (2) the timing of the involvement of participants in the different stages of the research process, and (3) the organization of communication among participants for each information flow (whether researchers, stakeholders, or policy makers).

25.7.2 Stage 2: Devising an Intervention Strategy

Vermeulen et al. (2009) have used intervention mapping (Bartholomew et al. 1998) to develop a structured stepwise RTW program for a participatory RTW intervention designed for workers sick listed due to musculoskeletal disorders. In essence, the approach linked a theory-based approach, beginning with a needs assessment, with engagement of the key stakeholders in clarifying the nature of the problem, identifying its determinants, designing the intervention, and implementing it.

McEachan et al. (2008) have also used intervention mapping to develop a worksite physical activity intervention designed to target awareness, motivation, and environment (e.g., management support) to address behavioral and interpersonal outcomes with the help of a facilitator manual, as a precursor to a cluster randomized trial (McEachan et al. 2011). The intervention consisted of an easy-to-implement toolkit delivered by in-house-trained local facilitators charged with encouraging increased physical activity using eight key identified components, delivered over a 3-month period with a focus on physical health benefits (month 1), mental health benefits (month 2), and social benefits (month 3). The intervention was delivered both at the worksite and at an individual level. Although no difference was found in the primary outcome (physical activity) between the intervention and control, other health benefits accrued. Careful analysis of the study is merited by the clarity of the methodology, intervention details, and the reflections on implementation and contextual factors.

25.7.3 Stage 3: Identifying Specific Targets as a Focus for Behavior Change

Having developed and designed an intervention and devised an intervention strategy, the final component is the identification of specific targets for intervention.

There is now a burgeoning literature on linking theory and intervention. Michie et al. (2008) recommended the incorporation of psychological theory in developing evidence-based practice and suggest the mapping of theoretically derived behavioral determinants to specific behavioral change techniques. A number of theories are illuminating, but the Theory of Planned Behavior (TPB) (Ajzen 1991) appears most extensively researched and lends itself well to specify elements in communication which can be specifically targeted. The McEachan et al. (2011) study (mentioned in Sect. 9.2) was developed using the TPB.

25.8 Implications for Management of Musculoskeletal Symptoms in the Return-to-Work Process

25.8.1 Refocus Educational Interventions

Arguably, there are three major challenges of work disability and RTW programs in achieving not just RTW but *sustained* RTW:

1. Enable an understanding not only of the relationships among symptoms, function, and work, but also of the challenges involved in returning to work, and how to optimize sustained re-engagement.
2. Change the perception of work environment as inherently dangerous to that of an environment which is capable of fulfilling our psychosocial and financial needs and enhancing our well-being.
3. Understand that the determinants of behavior change at the level of both the worker and the workplace with a view to designing effective interventions.

Importantly, these messages have to reach not only employees and health-care providers, but also employers.

25.8.2 Embed Blue (and Yellow) Flag Management into Clinical Practice

Psychologically informed practice (Main and George 2011) has already been suggested as a way of developing a more patient-centered approach to clinical management, but in addressing RTW in employees with low back pain a specific focus on occupational factors is required. The three-step care approach advocated by Shaw et al. (2009a) comprises of:

1. Initial screening beginning with identification of patients with significant workplace concerns (i.e., Blue Flags)
2. An additional more focused clinical interview including identification of workplace problems and possible solutions in those workers in whom pain and work dysfunction have lasted for more than 2 weeks
3. Exploration of problem solving with the individual, culminating in a worksite meeting (focused on analysis of job tasks with a view to provision of tailored work restrictions), appraisal of levels of supervisor and coworker support and development of an RTW strategy for those in whom pain and work dysfunction have persisted for 3–4 weeks

25.8.3 Use Appropriately Validated Measurement Tools

Relevant and accurate measurement is fundamental to constructing and evaluating interventions (Amick et al. 2000). Many newly developed and partly validated measurement tools have become available, and are referenced earlier in this chapter. Although promising, further research into their reliability, validity, and specific utility must be undertaken as a matter of priority.

25.8.4 Need for a New Evaluative Framework to Support the Development of Interventions

There are two assumptions about the approach to RTW that characterizes this chapter: (1) better working conditions and health among employees will lead to higher productivity/quality and customer satisfaction and (2) these outcomes in turn will benefit both the worker and the workplace.

It has also been argued that progress in the achievement of these aspirations requires a systematic approach. Kristensen (2005) recommended a framework linking theory, research, and practice with a focus on the measurement of theoretically supported changes in exposure/behavior. This is in line with recent UK implementation research recommending the targeting of behavior change techniques at theoretically derived determinants of behavior change (Michie et al. 2008).

25.8.5 Need for a New Inclusive Workplace Culture

What might be required to develop a new workplace culture? There are several considerations:

1. Understand the workplace as a complex psychosocial environment characterized at times by significant physical and mental demands influencing productivity.
2. Recognition that symptomatic people are the norm, particularly in the context of an aging workforce, and that persons as well as their symptoms come to work.
3. Accept that restoration to full symptom-free function often is not achievable.
4. Optimizing performance/productivity in workers burdened with symptoms such as pain and fatigue requires the adoption of a systems perspective focused on the determinants of optimal productivity, requiring consideration of work ability and not just work disability, and recognition of the worker as a resource rather than just as a cost.
5. Yellow or Blue Flags may constitute significant obstacles to RTW, but in a facilitative work environment, with effective communication in an atmosphere of trust, satisfactory reintegration into work is more likely to be achieved. A review of the literature on organizational development suggests a number of ways in which this RTW might be addressed.

25.8.6 The Need to Reconsider Performance and Absence Management

A constant theme throughout this chapter has been on the influence of policies and practices on performance and absence management on the RTW process. From a worker's perspective, inconsiderate and insensitive management of sickness not only can be a significant stress in its own right, but also may inhibit satisfactory work reintegration and delay RTW. If indeed a shift towards wellness and work ability is to be achieved, then there is clearly a need to integrate sickness absence and attendance management not only in practice but also in intent. This approach will require full engagement of all interested parties since, as aforementioned, it would appear that performance management policies are not always integrated in practice.

25.8.7 Case Management

RTW may involve complex negations about the funding and provision of treatment, involving not only the workers, but also their health-care provider, third-party payer, and employer and specific case management. According to Hanson et al. (2006), the key components of successful and cost-effective case management typically include allocation of a specific case manager. Important activities are as follows:

- Recognize and address personal and occupational obstacles to secure safe and sustainable RTW.
- Interface with health-care services (but not actually provide health care).
- Monitor all aspects of treatment and make treatment-funding decisions informed by normative data on the likely absence durations for conditions. Recognize when a case has exceeded a typical absence period and instigate a review of the case.
- Liaise directly with employer about RTW.
- Negotiate transitional work arrangements (p. ix).

25.8.8 Need for a New Strategic Approach to Intervention Design

There have been many interesting and promising attempts to solve the problem of work disability but they have been somewhat disappointing. Perhaps adoption of a sharper focus on specific and achievable objectives, translated into clearly specified interventions with an understanding of the determinants of behavior change, will enable the design of more successful interventions at both the level of the individual worker and the workplace.

25.9 Conclusions

We have moved towards more expansive and integrative theoretical models of the relationship between symptoms/injury and work disability. Most models are developed from a specific set of assumptions about the nature of work disability and have a range of utility in providing explanations, stimulating the targeting of interventions and first and foremost reducing the burden of work disability. Schultz et al. (2007) pleaded for the development of an agreed overall framework with a sufficient degree of specificity to significantly enhance our understanding (and management) of the RTW process. While laudable the plea is as yet still aspirational and it may be that for now all we can do is reach agreement on the need for an overall framework linking the individual, their workplace, and the wider context of work disability. Further, there is a need to consider RTW from the perspective of obstacles to recovery, and a focus on RTW via optimal re-engagement as in the Flags Initiative (Nicholas et al. 2011; Shaw et al. 2009a), with the integration of behavioral and psychosocial perspectives (Sullivan et al. 2005a). Linking the identification of modifiable risk factors for outcome with the design of interventions targeting obstacle recovery has been achieved, as in the recent STarTBack LBP trial (Hill et al. 2011). The challenge now is to apply this methodology to interventions focusing on the individual worker, the workplace, and the wider occupational context (Kendall et al. 2009).

25.10 Recommendations

We note and support Schultz et al.'s (2007) call for the development of an agreed overall framework with a sufficient degree of specificity to significantly enhance our understanding (and management) of the RTW process. Based on our review, we wish to make the following suggestions and recommendations.

1. Refocus the clinical management of musculoskeletal problems within the RTW process to address the psychosocial as well as the biomedical and biomechanical components of musculoskeletal disorders. We recommend the adoption of psychologically informed practice, which should include the identification and targeting of both clinical and occupational risk factors (i.e., Yellow and Blue Flags) as early as possible in the clinical intervention, and recognize that a modicum of further professional training may be required since recognition of psychosocial factors may not lead to a change in focus of the communication (Shaw et al. 2009b).
2. Optimal management of the RTW process, which in complex cases may require specific case management and needs active engagement with the workplace, necessitating an effective system of communication among all parties.
3. The line manager is pivotal, but the workplace culture throughout the organization needs to facilitate the RTW process, with buy-in from workers as well as management.
4. Appropriate systems for performance management and sickness management are crucial as they may constitute significant organizational obstacles (Black Flags) to effective re-engagement.
5. An explicit focus on wellness rather than on sickness and on work ability rather than on work disability may offer new strategies for the creation of a work environment conducive to minimizing the impact of musculoskeletal symptoms and facilitate re-engagement with work after illness or injury.
6. Identify sustained re-engagement in work as a key objective of an RTW strategy invites reexamination at an organizational level of factors likely to foster discretionary effort and diminish the impact of ongoing musculoskeletal symptoms on performance.
7. Design of an intervention needs to begin with consideration of the principles, processes, and general practices (outlined above) on which there is a consensus. However, effective interventions require careful focus, design, and delivery; beginning with clarity in terms of desired outcomes and clear specification of objectives, based on the identification of the determinants of behavior change and adoption of the appropriate evidence-based techniques to effect the change.
8. Design of "optimal" interventions, however, will need to be developed along with effective implementation strategies in the workplace.
9. Phillips et al. (2008) recommended prioritizing pain in policy making, stressing the need for a whole systems perspective. This recommendation is in alignment with the joined-up approach underpinning the Flags framework (Kendall et al. 2009). In our view, the problem of work disability and RTW in the context of troublesome musculoskeletal symptoms requires a similar breath of perspective.
10. We have long recognized the biomedical and biomechanical components of pain-associated disability, and it could be argued that there have been significant advances in our identification and understanding of the psychological components, but it is now time to develop a clearer and sharper focus on the *social* component (both in terms of communication and in terms of workplace culture) as part of the design and development of the next generation of interventions attempting to prevent/minimize work disability, and facilitate effective and sustained reintegration into the workplace.

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26

Fibromyalgia Syndrome or Chronic Fatigue Syndrome/Myalgic Encephalomyelitis and Factors Influencing Work Disability in Women

Monika Löfgren, Marie-Louise Schult,
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26.1 Introduction

Sick leave and disability pension contribute to major costs to the community (Breivik et al. 2006). Chronic musculoskeletal pain is one of the three most common reasons for long-term sickness-related absenteeism (Benavides et al. 2001; Woolf and Pfleger 2003). Of those on sickness benefit or disability pension for musculoskeletal pain, women are in the majority. Fibromyalgia (FM) is a common diagnosis among women with musculoskeletal pain. The prevalence of FM in Western countries is about 2 % (Perrot et al. 2011; Wolfe et al. 1995), more common among the female part of the population, about 80 % of those diagnosed with FM being women.

The cost of FM counted in lost working days and healthcare resources is high. In a study of healthcare resource costs, the cost incurred for employees with FM resembled that for a group with osteoarthritis, and was significantly higher than for a group of controls (White et al. 2008). Annual costs from a societal perspective have been calculated in Germany and France. Direct costs per year, including visits to a physician's clinic, medication and related out-of-pocket expenses, indirect costs, missed days at work, and lost productivity, reached €7900 in France and €7300 in Germany (Winkelmann et al. 2011).

Work is important for health. For women in general, being in work, even in a low-status job, is associated with better health and better economic outcomes (Lundberg 2002). Working women with FM report better health status and are more satisfied with their life situation than non-working women with FM (Henriksson and Liedberg 2000; Van Duijn et al. 2005). However, to remain in work when suffering from FM involves a struggle. In a study of work ability in working women with FM (Henriksson and Liedberg 2000), 99 % reported that FM symptoms affected their work. When exploring function and disability among 100 patients with FM, it was found that pain, tiredness, muscle weakness, and memory and concentration difficulties were the most prevalent symptoms reported by patients that limited their working ability the most (White et al. 1999a). For working women with FM, changes in working hours and work tasks due to FM symptoms were common

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(Liedberg and Henriksson 2002). In a review by Henriksson et al. (2005), the authors concluded that women with FM often continue to work, but that their symptoms limit their working ability.

Diagnostics, assessments, treatments, and rehabilitation of women with chronic fatigue syndrome/myalgic encephalomyelitis (CFS/ME) are a considerable problem for health and medical services. The prevalence of CFS (according to diagnostic criteria, see below) in a population-based study in the USA was 0.07–0.2 %, while 2–6 % of the patients reported chronic fatigue without meeting all of the criteria (Buchwald et al. 1995). In more recent studies, figures for prevalence vary widely, from 0.2 to 2.6 %, probably depending partly on the differing diagnostic criteria used (Cairns and Hotopf 2005; White et al. 2012). The prognosis for CFS/ME is poor if untreated. Many women with CFS/ME have low work capacity and are not at work, resulting in considerable costs to the community. In addition, many receive sickness benefits.

26.2 The Fibromyalgia Syndrome

The fibromyalgia syndrome (FM) is a complex chronic pain syndrome characterized by widespread muscle pain, tenderness, and fatigue. Other common symptoms are disturbed sleep, cognitive problems, decreased muscle endurance, bowel and bladder problems, and anxiety (Wolfe et al. 1990). In 1990, the American College of Rheumatology (ACR) developed criteria for classifying FM. They include chronic widespread pain for more than 3 months and pain in at least 11 of 18 specific tender points (Wolfe et al. 1990). Generalized allodynia/hyperalgesia distinguishes fibromyalgia from other chronic pain conditions. The symptoms and associated disability of FM often overlap other conditions, such as chronic fatigue syndrome (White et al. 2000), depression (Kassam and Patten 2006), and chronic headache (Weir et al. 2006), and are aggravated by, for example, stress and too strenuous physical activity.

The pathophysiology of FM is multifactorial but not yet fully understood (Bennett 1999; Vierck 2006). Abnormalities of the central nervous system interact with peripheral pain generators and psycho-neuro-endocrine dysfunction. In the periphery, muscle ischemia (Henriksson 1999), possibly caused by deficient regulation of blood flow in muscles during physical activity, has been found (Elvin et al. 2006). The microdialysis technique has been used in the trapezius muscle in women with FM; it showed altered concentrations of algesic substances together with metabolic alterations in the myalgic muscle and increased interstitial concentrations of pyruvate and lactate (Gerdle et al. 2010b). Centrally, a disturbed function of the autonomic nervous system (Cohen et al. 2001) and an impaired inhibition of pain (Vierck et al. 2001) were found.

The role of workplace low-level mechanical trauma, posture, and environment in the onset of chronic widespread pain has been addressed by McBeth et al. (2003). They investigated the relative contribution of individual psychosocial and work-related mechanical postural and environmental factors in symptom onset. They found that onset of chronic widespread pain was predicted by workplace factors (pushing/pulling heavy weights (RR = 1.8), repetitive movements of the wrist (RR = 1.8), kneeling (RR = 2.2)), and other pain at baseline. These results suggest that workplace factors might be important contributors to development and aggravation of FM symptoms.

In FM, depression is often seen as comorbidity (Jansen et al. 2011; Kassam and Patten 2006). Among those with FM, the prevalence of major depression was 22 %, compared to 7 % in the general population. Both FM and depression are negatively associated with work capacity (Jansen et al. 2011).

Living with continuous pain, fatigue, and cognitive as well as bodily symptoms has a severe effect on daily life (Henriksson and Burckhardt 1996; Liedberg and Henriksson 2002). Fatigue is often reported to be a greater hindrance than pain (Liedberg and Henriksson 2002). Patients report how the FM symptoms and limitations affect most parts of their lives and that they have had to change their way of living (e.g., doing everything at a slower pace, having to rely on help from others, trying to avoid heavier tasks, and spending more time resting and exercising) (Henriksson 1995). FM symptoms have a major negative effect on work ability, but work disability among women with FM varies (Henriksson and Liedberg 2000; Henriksson et al. 1992; Liedberg and Henriksson 2002; Lofgren et al. 2006) and with appropriate support and adaptation most women with FM are able to continue to work to some extent.

As described above, FM is a complex syndrome with extensive consequences for function. The International Classification of Function (ICF) is a useful tool when recognizing different aspects of health from a biopsychosocial perspective, providing a coherent view of FM. To facilitate clinical application, comprehensive core sets have been developed for different diagnoses (Brage et al. 2008; Lemberg et al. 2010; Schwarzkopf et al. 2008; Stucki and Grimby 2004). These core sets consist of up to a hundred ICF categories. They can be used as "checklists" in clinical assessment and clinical practice (Stier-Jarmer et al. 2009). The comprehensive ICF core set for chronic widespread pain (Cieza et al. 2004) includes 67 categories. They comprise 34 % from the component *body functions* (e.g., emotional functions, sensation of pain, energy and drive, and sleep functions). Two percent are categories from the component *body structures*, 41 % from the component *activities and participation* (e.g., carrying out daily routine, handling stress, and recreation and leisure), and 24 % from the *enviromental factors* (e.g., individual attitudes of immediate family members). A validation of the present core set for chronic widespread pain has been completed using the perspective of FM patients (Hieblinger et al. 2011). Focus groups identified concepts, which were linked to the ICF categories. Most categories of the present core set were confirmed by the patient groups.

In a study on healthcare costs, more than 8000 employees with FM, 8000 employees with osteoarthritis, and 7000 controls from 31 different companies in the USA were compared (White et al. 2008). Employees with FM missed an average of 15 % of all working days in a calendar year, approximately three times the work loss in controls. Further, the average healthcare cost in the FM group was significantly higher than among the controls and the indirect costs were more than twice the controls. Winkelmann et al. (2011) concluded that FM imposes a significant economic burden on society. The costs are also high for the individual. European women with FM have substantial costs related to FM, of which over 75 % were indirect costs for lost productivity (Winkelmann et al. 2011).

26.2.1 Return to Work Among Women with Fibromyalgia

26.2.1.1 Causes of Sickness Absence

Much research has concentrated on causes of sickness absence, and there is still much more to learn. However, there is also a lack of knowledge about how to succeed in back-to-work rehabilitation. What are the success factors and what are the factors that are less important? In this section, the causes of sickness absence and factors of success are both discussed.

A review by Henriksson et al. (2005) explored disability and work situation in women with FM, showing that limitations caused by pain, fatigue, decreased muscle strength, and endurance influence work capacity. Further, total life situation, other commitments, type of work task, ability to influence work situation, and the physical and psychosocial work environment are also important factors in determining whether a person can remain at work.

Women with FM have reported that symptoms limiting their work ability were pain (reported by 87 %), tiredness (80 %), muscle weakness (73 %), and memory and concentration difficulties (51 %) (White et al. 1999b). Research shows gender differences in the labor market; for example, in Sweden and Europe women work mostly in office and customer services, health, elderly, and child care, and as shop assistants and cashiers (Sweden Statistics 2011). These occupations often include stressful situations, monotonous, static or repetitive muscle load, and lifting in awkward body positions, reportedly difficult for women with FM (Henriksson et al. 2005).

When performing a standardized work task, women with FM had a 59 % reduction in voluntary muscular strength compared with healthy controls (Cathey et al. 1988). According to an electromyographical study by Gerdle et al. (2010a), reports of inability to relax muscles, or increased muscular tension, in persons with trapezius myalgia have focused attention on the association between neuromuscular control mechanisms and chronic pain. Several neuromuscular control mechanisms are candidates for preventing muscular fatigue and pain. One mechanism, which prevents monotonous prolonged activation of motor units and local fatigue, involves a reciprocal reversal of activity between regions in a single muscle, termed “differential activation.” The main finding of the Gerdle et al. (2010b) study was a lower median frequency of differential activations, and thus a longer average duration of differential activation between the trapezius regions in FM women compared with healthy controls during static shoulder elevation with no or very low weights. It was concluded that the neuromuscular control mechanism involving a degree of shift between regions (differential activation) within a single muscle differs between FM women and healthy controls. These results, together with other muscular deficits in women with FM (Elvin et al. 2006; Henriksson et al. 1982; Mannerkorpi and Ekdahl 1997; Mannerkorpi et al. 2006), were associated with the work demands women with FM described as difficult.

Work demands that are “difficult” for women with FM to perform include repetitive movements, static muscle work as in holding, standing, or sitting in the same positions for longer periods, heavy work, working above shoulder level, power gripping, and frequent carrying and lifting (Henriksson et al. 2005). Activities that include holding or lifting are reported as difficult or impossible by 20–50 % (Henriksson et al. 1992). These problems make seemingly simple activities like lifting a plate from the table or sink or holding tools difficult to manage (Henriksson and Liedberg 2000). Work tasks that are reportedly difficult to manage are physically heavy work, computer work, and talking on the telephone (Henriksson et al. 1992; Henriksson and Liedberg 2000). Tasks reported to possibly increase pain include writing on a blackboard, lifting books or files from shelves, and helping small children with buttoning clothes and tying shoelaces. Light work, which requires static muscle work, bending, dexterity, and coordination, also increases pain or can be impossible to manage (Henriksson and Liedberg 2000). These difficulties are in line with the FM pathophysiology features such as deficient regulation of blood flow in muscles during physical activity (Elvin et al. 2006) and altered neuromuscular control (Gerdle et al. 2010b).

The association between chronic pain conditions and workplace disability is strongly associated with the same socioeconomic factors as in other chronic conditions (Teasell and Finestone 1999). The factors associated with return to work are age, education, income, marital status, and heavier work tasks. White et al. (1999b) also found that the number of major symptoms, the level of satisfaction with health, the number of tender points, education level, and physical stress in the prior employment predict work disability in patients. A study of younger women with FM from Sweden and the USA showed that those who remained employed were older, perceived considerably less difficulties in daily activities, and experienced less severe symptoms, and pain interfered less with their work ability (Liedberg et al. 2006; Lydell et al. 2009). Factors predictive of sustained return to work in people with musculoskeletal disorders undergoing rehabilitation were number of sick-listed days before rehabilitation, age, self-rated pain, physical capacity, self-rated functional capacity, educational level, and light physical labor (Lydell et al. 2009).

26.2.1.2 Those Who Remain at Work: Success Factors

Cooperation among rehabilitation actors is a success factor for return to work for people on long-term sick leave (Jakobsson et al. 2011; Karrholm et al. 2008). Those who participated in a cooperation project reduced their number of sick leave days (Karrholm et al. 2008) and more were at work 6 years after, compared to usual management (Jakobsson et al. 2011).

The literature provides examples of reasons why workers with chronic pain and women with FM continue to work despite pain and other severe symptoms. Workers who stayed at work despite chronic musculoskeletal pain had four key motivators: work as value, responsibility, therapy, and income. Five success factors for staying at work were identified as follows: personal characteristics, adjustment latitude, coping with pain, use of healthcare services, and pain beliefs (de Vries et al. 2011).

For women with FM, the work role is an important part of their identity and serves as a motivator to continue working (Henriksson 1995; Liedberg and Henriksson 2002; Lofgren et al. 2006). Values and norms, structural factors in society, working conditions, and other commitments are also important for remaining in the work role (Liedberg and Henriksson 2002). The women described that work meant opportunities for social relations, personal development, and a sense of community, and that work gave the day and week a time structure (Liedberg and Henriksson 2002). Many women with FM on sickness benefits grieved for their loss of working life (Gustafsson et al. 2004; Henriksson 1995; Liedberg and Henriksson 2002).

To be able to remain at work, women with FM need workplaces and work tasks which are flexible and adjustable. They need to be able to change and alternate work positions and work tasks, take short breaks during work, and in many cases reduce working hours. They often need to work at a slower pace and divide strenuous activities with breaks or other task changes. It helps them if working time is flexible so that they can work more when they feel better and less when symptoms are aggravated (Henriksson and Liedberg 2000; Henriksson 1994; Henriksson et al. 2005; Lofgren et al. 2006).

The experience of women with FM who, despite difficult symptoms, managed to work many years after rehabilitation has been explored by Lofgren et al. (2006). The women had made changes in almost every aspect of their lives. To manage, they used a wide variety of conscious, action-oriented strategies, described in Box 26.1 and Fig. 26.1.

Box 26.1 Strategies used to manage the symptoms by working women with FM (Lofgren et al. 2006). Reprinted by permission of the publisher

Strategies
Slow tempo
Split activities
Prioritizing, planning
Rest
Various forms of heat
Exercise, keeping fit
Perceiving signals from the body and respecting them
“The pain is not dangerous”
Positive thoughts
Enjoying life as much as possible
Positive view of life
Unwillingness to give in

Women who resumed work developed these strategies over many years. They described how the rehabilitation program had helped them accept their limitations and how it had been a starting point for finding alternative ways of being active and participating. Commonly used strategies included consciously enjoying life and taking care of oneself by striving for a bodily balance. It was, the women reported, necessary to have accepted the boundaries associated with FM to be able to manage the struggle. They had worked through the loss of their former capacity—both bodily and personally—and through difficult feelings of disappointment with life, self-blame, and despair. They described how they reached a turning point when they began to accept the situation, and that it was then that they could start to develop a new way to manage life and work (Lofgren et al. 2006).

All these research results indicate that successfully managing the extensive symptoms of FM, together with the demands of working life, is a challenging and rather time-consuming task.

26.2.1.3 Not Returning to Work

The work return outcome is influenced by many factors that can facilitate or hinder work resumption. They include (1) principles of Social Welfare

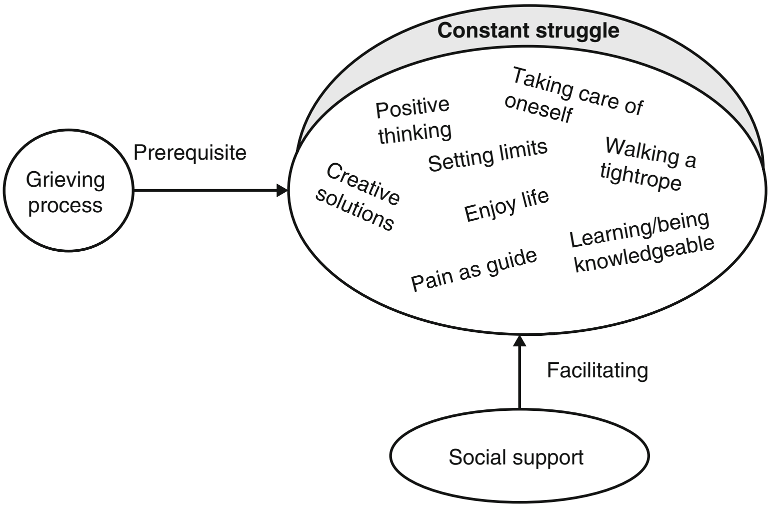

Fig. 26.1 Model of the constant struggle: Strategies shown are used by working women with FM; the two categories, grieving process and social support, influence their ability to use the strategies (Lofgren et al. 2006). Reprinted by permission of the publisher

Law/Social Security Law (changes in a law can markedly influence return to work in either direction), (2) the rehabilitation actors' applications of these laws, (3) the resources and effectiveness of the rehabilitation actors, (4) the quality of cooperation among rehabilitation actors, (5) current labor market situation, (6) medical factors, and (7) personal factors (Chamberlain et al. 2009). The ICF (WHO 2001) views most of these factors, except the medical and personal factors, as environmental.

Exploration of sick-listed individuals' experience of not returning to work after multidisciplinary rehabilitation showed barriers, such as pain and somatic symptoms, fatigue, and not fulfilling work requirements (Sjostrom et al. 2011). Almost the same was true in women's narratives concerning work ability: confusion, coping with fluctuating symptoms, and being near over the edge with exhaustion were reported. Severe pain and fatigue symptoms, combined with a demanding life situation and aging, led to a substantial decrease in work ability (Sallinen et al. 2010).

There are often difficulties in cooperation among the social insurance office, unemployment office/job center, employer, and health and medical services, with long time gaps between different services provided for the patient. Failure of one link can destroy the efforts of all the others. To achieve a successful result for a patient undergoing work rehabilitation, it is important that all the links in the rehabilitation chain function properly, with adequate cooperation among the actors (Chamberlain et al. 2009; Karrholm et al. 2008).

26.2.2 Best Return-to-Work Interventions and Key Practices for Women with Fibromyalgia

For a woman affected by a chronic condition such as FM, life cannot be expected to return to what it was like before. The woman has to challenge previous ways of living and of knowing her body and self (Charmaz 2000). People who become chronically ill lose their control over life. They have to find ways to make sense of their strange symptoms, reconstruct a new order, and regain control over life (Charmaz 2000; Lachapelle et al. 2008).

In this perspective, return-to-work interventions need to focus on restoring activity and participation ability, for example, by (1) helping clients improve fitness and learn new coping and adaptation strategies, (2) assisting them to get back to a sustainable employment, and (3) providing appropriate support when they wish to adapt to their situation and become validated as adults, both in their own eyes and in the eyes of others (Charmaz 2000). Also, many “external” factors are of importance for return to work. It remains necessary to emphasize that employers, unemployment rate, work opportunities, and laws and regulations have to be considered when planning for the optimal return-to-work intervention in FM cases.

26.2.2.1 Multidisciplinary Rehabilitation Programs

The effects of rehabilitation on work return vary in different studies, though a clear focus on return seems to be important for success. Multidisciplinary rehabilitation for patients with FM and other chronic pain conditions is advocated by systematic evaluations (Goldenberg et al. 2004; Sim and Adams 2002). A Cochrane report, updated in 2008 (Karjalainen et al. 2000), concluded that there is yet limited evidence for effectiveness of multidisciplinary rehabilitation for patients with FM, but that behavioral treatment and stress management appear to be important, and education in combination with physical training shows some positive effects in long-term follow-up. These measures usually form parts of multidisciplinary rehabilitation programs. No specific rehabilitation measures for FM have been shown to be essential; on the contrary, a specific multidisciplinary rehabilitation program for FM provided no benefit in reducing work disability compared to that of a nonspecific multidisciplinary musculoskeletal rehabilitation program (Suoyrjo et al. 2009). There might be a gender difference in what measures are effective. In a study by Jensen et al. (2005), women with chronic pain benefited more from full-time, multidisciplinary rehabilitation with a behavioral approach than men did. The implications of those findings need further study.

26.2.2.2 Workplace Training

For return to work, modified work training in the workplace is common. In Sweden, an evaluation by the Swedish national insurance offices found that although rehabilitation measures were offered equally to women and men, women more often received less expensive measures such as workplace training, while men were granted more expensive measures such as education/training (Marklund 1997). Opinions differ as to the effect of workplace training. Van Duijn et al. (2005) found no effect for workplace training alone on return to work after a sick leave for musculoskeletal pain. However, as a part of an extensive rehabilitation program for patients with musculoskeletal pain, workplace training was found to be effective (Loisel et al. 1997).

26.2.2.3 Participation, Support, and Coordination

Research indicated the importance of taking account of the perceptions and views of individuals participating in rehabilitation and that they should be actively engaged in all decisions (Selander et al. 2007; Straaton et al. 1996; Glavare et al. 2012). In the complicated return-to-work process with many actors, the importance of this engagement is most evident, but can be difficult to achieve. Also, service coordination to minimize the waiting time between various rehabilitation services and programs, in addition to individualized professional support, is likely to improve return-to-work outcomes (Dekkers-Sanchez et al. 2010; Juvonen-Posti et al. 2002). Eleven persons with chronic pain, five of whom were women with FM, and who had participated in a coached work training program following multidisciplinary rehabilitation, were interviewed about possibilities for and barriers to return to work (Glavare et al. 2012). They reported that their return to work was facilitated by the support that got them involved in their rehabilitation process and strengthened their own resources. The support came from different sources, for example, from their rehabilitation team—in identifying work tasks which can be accommodated and matching their capacity and limitations and selecting the right timing to increase working hours. The interviewees also described support in the workplace where they felt that they were valued coworkers. Those who did not return to work reported little support and more negative responses, such as not being listened to or respected, excessive demands, and feeling dominated. Such negative responses were important obstacles to rehabilitation and return to work, making the individual feel excluded, abandoned, and not believed in. This study underscored the importance of support where the individual client is actively involved and feels listened to (Glavare et al. 2012).

Juvonen-Posti et al. (2002) showed positive results of professional support offered by a pain rehabilitation clinic for individuals with chronic pain during their rehabilitation process. Within this setting, many mistakes can be avoided during rehabilitation for return to work. Such mistakes include recommending work tasks beyond the person's capacity or increasing working hours too fast. Importantly, rehabilitation professionals can help clients deal with uncertainty about pain, health, and work capacity, an uncertainty that otherwise might be a barrier to work return (Patel et al. 2007).

Some projects have studied the benefits of coordination and cooperation among the actors in the return-to-work process (Kärrholm et al. 2008), including rehabilitation clinic and social security offices;, but many problems remain.

26.2.2.4 Adjustment in the Work Situation

Adjustment in the work situation, understood as both work accommodation and modification, is an important part of return to work for women with FM. If their work situation is adjusted to their abilities and needs, the women continue to work and find work rewarding (Henriksson and Liedberg 2000; Henriksson et al. 2005; Lofgren et al. 2006).

The daily variability in pain and other symptoms makes work and work planning more difficult. The work situation needs to be modified and accommodated according to woman's abilities and problems, but some general guidance is available from pathophysiology and reported experience (Henriksson et al. 2005). Work situations with heavy physical tasks, static, repetitive, or eccentric muscle work, frequent lifting or carrying, and working above shoulders should be avoided by women with FM (Henriksson et al. 2005). Flexible working hours, dividing strenuous activities, and working ergonomically are accommodations reported as helpful at the workplace (Lofgren et al. 2006). To reduce stress as much as possible, by, for example, having one's workstation in a quiet corner of the office or getting a room of one's own, is another accommodation that has been found to help working women with FM (Lofgren et al. 2006). Ability to adjust working hours according to the time of year (Lofgren et al. 2006) and the variability in pain and other symptoms (Henriksson and Liedberg 2000; Henriksson et al. 2005; Lofgren et al. 2006) are also of assistance to some FM sufferers to continue working.

26.2.2.5 Body Awareness/Fitness

Body awareness and ability to relax are techniques which patients with FM report as helpful for controlling pain and muscle symptoms (Gustafsson et al. 2004; Lofgren et al. 2006). A multidisciplinary rehabilitation program using a combination of basic body awareness (Gard 2005) and a work technique training with EMG biofeedback (Lofgren et al. 2008) was evaluated by measuring muscle activity before and after the program. The aim was to improve the women's posture and muscular activity patterns. The women were able to lower their trapezius pars descendens activity during task performance after rehabilitation (Lofgren et al. 2008). Ratings of exertion and pain during activity decreased and tended to follow the decrease in muscle activity. These results suggest that learning a more functional pattern of work movements is an important part of return to work for women with FM. Results from two interview studies support these findings: women with FM describe how body awareness and ability to relax help them to control their pain and other symptoms (Gustafsson et al. 2004; Lofgren et al. 2006).

Muscle weakness and pain severely contribute to the difficulties women with FM experience as barriers to work (Mannerkorpi et al. 1994; White et al. 1999a). FM is associated with muscular difficulties, which adversely affect the ability to perform dynamic work tasks. Examples include decreased relaxation between dynamic muscle contractions (Elert et al. 1989) and diminished output during dynamic activity compared to pain-free controls (Elert et al. 2001), impaired isometric shoulder muscle endurance (Mannerkorpi et al. 1994), and decreased muscle blood flow during exercise (Elvin et al. 2006). To improve muscle functioning, it can be helpful for persons with FM to learn a relaxed movement pattern with as little muscle activity as possible. Also, pain and exertion might improve with a relaxed movement pattern.

Notably, hyperalgesia is a main symptom in FM and theories differ about its cause. Sensitization of the central nervous system (CNS) produces increased general pain sensitivity and is an important mechanism in maintaining pain in FM (Staud et al. 2004a, b). Central sensitization, once established, can be maintained by very low stimulus frequencies (Staud et al. 2004a). Also, women with FM have reduced tissue vascularity compared to healthy controls (Elvin et al. 2006). The authors (Elvin et al. 2006) suggest that deconditioning and/or inability to relax between contractions would contribute to women with FM obtaining less blood flow to the tissue following dynamic work. The reduced vascularity seen during static contractions in women with FM could be explained by a complex interaction among deconditioning, a disturbance of the sympathetic nervous system, and muscle ischemia. Muscle ischemia could contribute to pain by maintaining central sensitization in FM (Elvin et al. 2006). These suggestions support the hypothesis that improved posture and a more relaxed muscular activity pattern might lessen pain and muscle difficulties during work activity in FM cases.

Physical capacity is an important predictive factor for return to work among persons with chronic pain (Lydell et al. 2005, 2009). Functional training, suitable for the current work situation, is considered an important part of return-to-work rehabilitation (Karjalainen et al. 2000). Meta-analyses (Dinler et al. 2009; Hauser et al. 2010) showed that aerobic exercise reduces pain, fatigue, and depression and improves physical fitness and health-related quality of life in women with FM. Positive outcomes can be achieved with different kinds of exercise: aerobic, strength, or a combination of both. A recent study using medical imaging indicates that increased physical activity has a positive effect on pain perception in women with FM (McLoughlin et al. 2011).

In addition, FM sufferers show less muscular endurance than healthy women; they have lower perceived functional ability and demonstrate impaired physical performance (Jones et al. 2010; White et al. 2000). According to this research, although women with FM have much to gain by following recommendations on exercise on a regular basis (Busch et al. 2011), they are often less physically active than healthy women (Mcloughlin et al. 2010). Ongoing symptoms often make it difficult for the women to manage exercise at a sufficiently high level to achieve desired benefits. In exercise studies, many participants found it difficult to perform and adhere even to moderate-intensity programs because of an increase in symptoms (Clark et al. 2001). For this reason, coached exercise programs or carefully developed recommendations for and evaluation of self-managed exercise are recommended. The exercise can be performed in different ways: aerobic training, strength training, training in a warm-water pool, tai chi, yoga, Nordic walking, and lifestyle activities (Busch et al. 2011; Mannerkorpi 2005). Most importantly, the woman herself needs to be attracted to the exercise to improve her self-efficacy and adherence.

26.2.2.6 Acceptance

Women who live with FM find ways to adapt their way of living to their constant pain (Gustafsson et al. 2004; Gullaksen and Liedbeck 2004; Lofgren et al. 2006; Lachapelle et al. 2008). The working women who experience life satisfaction and maintain a sense of control despite FM also describe how they accept the FM with associated pain and other symptoms (Lofgren et al. 2006). Studies indicate that pain acceptance can be an important part of the rehabilitation process, decreasing distress and disability (McCracken et al. 2004a, b). Women with FM reveal that their acceptance experience is a process involving realization and acknowledgement. They tend to realize that their pain is now a normal condition, acknowledge that there is no cure, and realize that they need to redefine the new “normal” (Lachapelle et al. 2008).

Factors found to promote acceptance include diagnosis, social support, educating self and others, and self-care. Barriers to acceptance include struggling to retain their pre-pain identity, others not accepting their pain, and the unspoken message that the pain was "all in their head" (Lachapelle et al. 2008). This acceptance process recurs in the working women with FM who find it necessary to accept the bodily boundaries imposed on them by the FM in order to develop new strategies and live a satisfactory life (Lofgren et al. 2006).

26.3 Chronic Fatigue Syndrome/ Myalgic Encephalomyelitis

Myalgic encephalomyelitis (post-viral fatigue) is classified by the WHO ICD-10 as a neurological disease (G93.3). Its origin is based on descriptions of epidemic outbreaks of polio-like disease during the twentieth century with an unidentified suspected infective causative factor. Sporadic cases were also reported, often linked to post-infective onset, for example after mononucleosis (Epstein–Barr Virus [EBV]). Diagnostic criteria were first proposed in 1988 (Wessely et al. 1998), later modified by the international expert group headed by the American Center for Disease Control (CDC), and termed the CDC or Fukuda criteria (Fukada et al. 1994). The syndrome was initially defined as "chronic fatigue syndrome" based on one major symptom, severe mental and physical fatigue persisting over 6 months, and at least four of eight additional symptoms, including (1) post-exertional malaise (exacerbation of symptoms after mental or physical activity, lasting for over 24 h), (2) recurrent sore throat, (3) tender cervical or axillary lymph nodes, (4) muscle pain and multi-joint pain, (5) new headaches, and (6) unrestorative sleep. Cognitive symptoms were also identified and included concentration and memory problems. "Chronic fatigue syndrome" was defined as an exclusionary diagnosis where other somatic or psychiatric diseases needed to be excluded first.

The link and the causative relation to infectious disease have been strongly debated, and research has been somewhat divided between groups primarily seeing CFS/ME as a psychosomatic disease and groups viewing the syndrome as a biologically based disease (Evengard et al. 1999; Holgate et al. 2011). Definitions based on a psychological fatigue model have been published, focusing on the symptom of medically unexplained chronic (over 6 months), namely fatigue (Sharpe et al. 1991), contributing to development of comorbid psychiatric disorders, such as depression and anxiety disorder.

Recent longitudinal prospective cohort studies show an increased risk of developing a syndrome that fulfils the CDC diagnostic criteria following several infectious disorders, including EBV and Ross River virus (White 2007), a syndrome, which is clearly not related to depression or previous psychiatric disease. Randomized controlled trial (RCT) treatment studies of CFS/ME also, although small and not yet confirmed in larger trials, show significant effects of immunomodulatory treatment in CFS/ME (Fluge et al. 2011; Fluge and Mella 2009; Rowe 1997; Zachrisson et al. 2002, 2004). Notably, the CDC criteria are criticized for not clearly excluding mental disorders, such as depression and anxiety disorders. New criteria, the so-called Canadian criteria (Carruthers et al. 2003), seem to identify patients with a more severe disease.

Recent research also more clearly defines stress-related fatigue, burnout syndrome, or maladaptive stress reaction (Peterson et al. 2011; Sandahl et al. 2011). Most previous research on rehabilitation of CFS/ME is impeded by the application of the CDC criteria, which was not designed to exclude the burnout syndrome (which was not defined at the time). Burnout-related chronic fatigue is probably much more prevalent than post-viral fatigue, and data suggest that it might have a better prognosis and a more favorable response to graded exercise therapy (GET) and cognitive-behavioral therapy (CBT), whereas CFS/ME (post-viral fatigue) has a poorer prognosis with long-standing functional impairment and activity limitations which are not responsive to "deconditioning" therapy and graded exercise (Bell et al. 2001).

Patients with unexplained prolonged fatigue not meeting all the diagnostic criteria are usually classified as idiopathic chronic fatigue (CF). The pathophysiology of CFS/ME is unknown but one prominent hypothesis is gaining increasingly more credence; it postulates that the disease is a neuroinflammatory disease (Selmi et al. 2011). Notably, cases of CFS/ME are reported that were linked to post-infective onset, for example after mononucleosis (EBV).

Diagnostic criteria for CFS were first proposed in 1988 (Wessely et al. 1998). The natural history of CFS has been studied over 10 years. In a community-based sample, unbiased by help seeking, the CFS group remained rather ill with a variety of different conditions over time (Jason et al. 2011). CFS is reportedly more common in women (60–70 %), and the biological-versus-psychological debate regarding the disease has been analyzed from a feminist perspective (Richman et al. 2000).

In addition to their direct use for diagnostics, another way of using symptom criteria is by linking symptoms and signs to categories of functioning according to the WHO ICF model (WHO 2001). Using CFS/ME symptom criteria, mainly categories at the body function level will be identified as such according to the WHO ICF. CFS/ME patients also have activity limitations and participation restrictions, about which little has been published.

The abbreviated 2003 version of the Canadian criteria for CFS/ME (Carruthers et al. 2003) is presented below. Among other materials, a “tick chart” has been developed for the initial consultation. Sections 26.1–26.6 must all be met as indicated below:

1. *Post-exertional malaise and fatigue*. All three criteria in this section must be met: (a) The patient must have a marked degree of new-onset, unexplained, persistent, or recurrent physical and mental fatigue that substantially reduces activity level; (b) post-exertional fatigue, malaise, and/or pain; and (c) a delayed recovery period (over 24 h to recover).
2. *Sleep disorder*. This criterion must be met: It involves unrestorative sleep or altered sleep pattern (including circadian rhythm disturbance).
3. *Pain*. This criterion must be met: Arthralgia and/or myalgia without clinical evidence of inflammatory responses of joint swelling or redness, and/or significant headache of new type, pattern, or severity.
4. *Neurological/cognitive manifestations*. Two or more of the following criteria must be met: (a) Impairment of concentration and short-term memory; (b) difficulty with information processing, categorizing, and work retrieval, including intermittent dyslexia; (c) there may be an overload phenomenon: information, cognitive, and sensory overload (e.g., photophobia and hypersensitivity to noise) and/or emotional overload which may lead to relapses and/or anxiety; (d) perceptual and sensory disturbances; (e) disorientation or confusion; and/or (f) ataxia.
5. *Autonomic/neuroendocrine/immune manifestations*. At least one symptom in at least two of the following three categories must be met: (a) *Autonomic manifestations*: (1) orthostatic intolerance (neurally mediated hypotension), (2) postural orthostatic tachycardia syndrome (POTS), (3) vertigo and/or light-headedness, (4) extreme pallor, (5) intestinal or bladder disturbances with or without irritable bowel syndrome (IBS) or bladder dysfunction, (6) palpitations with or without cardiac arrhythmia, (7) vasomotor instability, and/or (8) respiratory irregularities; (b) *neuroendocrine manifestations*: (1) loss of thermostatic stability, (2) heat/cold intolerance, (3) anorexia or abnormal appetite and weight change, (4) hypoglycemia, (5) loss of adaptability and tolerance for stress, worsening of symptoms with stress, and slow recovery, with emotional lability; and/or (c) *immune manifestations*: (1) tender lymph nodes, (2) recurrent sore throat, (3) flu-like symptoms and/or general malaise, (4) development of new allergies or changes in status of old ones, and/or (5) hypersensitivity to medications and/or chemicals.
6. The illness must persist for at least 6 months. This criterion must be met.

Originating from the 2003 Canadian criteria, typical ICF categories of impaired function in CFS/ME patients would be as follows: energy and drive functions (b130), exercise tolerance functions (b455), muscle endurance functions (b740), sleep functions (b134), sensation of pain (b280), attention functions (b140), memory functions (b144), thought functions (b160), higher level cognitive functions (b164), control of voluntary movement functions (b760), blood pressure functions (b420), sensations associated with cardiovascular and respiratory functions (b460), sensations associated with the digestive system (b535), thermoregulatory functions (b550), weight maintenance functions (b530), and immunological system functions (b435) (Njoo 2012).

If the Fukada et al./CDC criteria (Fukada et al. 1994) are used for the same purpose, the list of ICF categories originating from the diagnostic criteria is shorter but with many identical categories. However, this listing will include some disability categories. The criteria on chronic fatigue and mental problems are further specified with "and results in substantial reduction in previous level in occupational, educational, social or personal activities"—this includes remunerative employment (d850), recreation and leisure (d920), carrying out daily routine (d230), acquisition of food and services (d620), preparing meals (d630), doing housework (d640), personal self-care (d5), and caring for others (d660). The following categories are linked as well: energy and drive functions (b130), memory functions (b144), attention functions (b140), immunological system functions (b435), sensation of pain (b280), sleep functions (b134), and exercise tolerance functions (b455) (Njoo 2012).

26.3.1 Return to Work Among Women with Chronic Fatigue Syndrome/Myalgic Encephalomyelitis

26.3.1.1 Work Disability in Chronic Fatigue Syndrome/Myalgic Encephalomyelitis Women

Much less has been published about work disability in CFS/ME than in FM, and the proportion of women is often not indicated. Cairns and Hotopf (2005) published a systematic review of studies describing the prognosis for chronic fatigue (CF) and chronic fatigue syndrome (CFS). Twenty-eight articles met the criteria for inclusion in the review and, for the 14 studies of patients meeting criteria for CFS, the median full recovery was 5 % (range 0–31 %) and the median proportion of patients who improved during following up was 39.5 % (8–63 %). Return to work at follow-up ranged from 8 to 30 % in the three studies that considered this outcome. From the rehabilitation perspective, it has been concluded that medically prompted retirement of individuals with this condition should be postponed until appropriate rehabilitative interventions have been tried. A limitation of this review was that the proportion of women was not indicated. However, since CFS/ME is more common in women, it can be assumed that a majority of the participants in the studies were women.

Fatigued employees on sick leave underwent a follow-up after 4 years to determine long-term predictors of work disability (Leone et al. 2006). Inclusion criteria were the presence of severe fatigue for at least 4 months in combination with complete absenteeism from work for 6–26 weeks. Individuals with granted disability pension at the beginning were excluded. The participants were classified into fatigue cases and CFS-like cases (if potential for chronic fatigue syndrome was judged to exist) using particular research criteria based on the CDC criteria. Fifty-six percent of the 127 employees were women, and 26 % of the participants were receiving work disability benefits at the 4-year follow-up. Older age and lower levels of physical functioning predicted work disability. A CFS-like status was predicted by female gender and lower levels of physical functioning.

CFS-like cases at baseline were three times more likely to be unable to work at a 4-year follow-up than fatigued employees who did not meet CFS criteria at baseline, in another study with 56 % women ($n = 127$) (Huibers et al. 2006). A CFS-like status (compared to non-CFS fatigue) proved to be a strong predictor of an inactive work status and full work incapacity in the long term.

26.3.2 Best Return-to-Work Interventions and Key Practices in Women with Chronic Fatigue Syndrome/Myalgic Encephalomyelitis

In 2006, Chambers, Bagnall, Hempel, and Forbes updated a systematic review published in 2002 (Bagnall et al. 2002) to determine whether any particular intervention or combination of interventions is effective in the treatment, management, and rehabilitation of adults and children with CFS/ME. Seventy studies now met the inclusion criteria. Studies on behavioral, immunological, pharmacological, complementary therapies, nutritional supplements, and miscellaneous other interventions were identified. GET and CBT appeared to reduce symptoms and improve function, based on evidence from RCTs. For most other interventions, evidence of effectiveness was inconclusive and some interventions were associated with significant adverse effects. The authors' statement of principal findings is as follows. A number of RCTs suggest that behavioral interventions, including elements of CBT, GET, and rehabilitation, may reduce symptoms and improve functioning among people with CFS/ME. Immunological and antiviral treatments may have beneficial effects but are also associated with harmful side effects. Most pharmacological treatments have not shown beneficial effects. A limitation of this review—in this chapter context—is that the conclusions are based on adult and child participants and the proportion of women is unknown. In addition, return to work was not a specific outcome measure. However, it is probable that the main conclusions can be seen as relevant for the theme of this chapter—women and work resumption.

26.3.2.1 Cognitive-Behavioral Therapy

In an early Cochrane review (Price and Couper 1998), it was concluded that CBT appears to be an effective and acceptable treatment for adult outpatients with CFS. The review was updated in 2008, when 15 studies were included (1043 CFS patients) (Price et al. 2008). It was concluded that CBT is effective in reducing the symptoms of fatigue posttreatment compared with usual care and may be more effective in reducing fatigue symptoms than other psychological therapies. However, the evidentiary basis at follow-up is limited to a small group of studies with inconsistent findings.

A recent randomized trial, with 77 % women, concluded that CBT and GET can safely be added to specialist medical care to moderately improve outcomes for CFS, but adaptive pacing therapy (APT) is not an effective addition (White et al. 2011). In this review, treatment strategies used in four different types of intervention were also described.

The long-term efficacy of CBT conducted by general practitioners for fatigue (CF, not meeting all criteria) showed no difference between the intervention group and control group with respect to fatigue and sick leave (Leone et al. 2006).

Consecutive outpatients at a CFS treatment service were studied for associations between occupational status, symptom severity, and cognitive and behavioral responses to symptoms (Knudsen et al. 2011). All patients had high symptom levels, but those on long-term sickness absence had significantly more physical fatigue and worse sleep. Patients with long-term sickness absence also demonstrated more embarrassment-avoidance cognition and avoidance-based behavioral responses. It was concluded that identifying and addressing avoidance behavior and cognition regarding embarrassment in interventions may improve patients' chances of returning to work.

Only about 30 % of people with CFS/ME recover after CBT; thus methods for improving treatment outcomes are needed. A pilot randomized study (Rimes and Wingrove 2013) demonstrated that a mindfulness-based intervention was associated with reduced fatigue and other benefits for people with CFS who were still experiencing excessive fatigue after a course of CBT.

26.3.2.2 Graded Exercise Therapy

A systematic review of the level of daily physical activity of patients with chronic fatigue syndrome (Evering et al. 2010) included 17 studies. Myalgic encephalomyelitis was also included among the search words. Fourteen studies, including 18 comparisons, demonstrated lower physical activity levels in patients with CFS than in controls. A meta-analysis showed that the level of daily physical activity in CFS patients was only 68 % of that observed in controls. This review provides a proportion of women for each study, showing a clear majority of women. In GET, therapeutic approaches are outlined that are specific to different fitness levels among patients with CFS/ME (Pardaens et al. 2006).

Studies of chronic fatigue syndrome, deconditioning, and GET have been commented on in a letter to the editor (White and Fulcher 2002), noting that two systematic reviews of the management of CFS/ME concluded that GET had positive results in three studies of high quality (Whiting et al. 2001). Graded exercise programs, designed to reverse deconditioning, are described as a safe and effective treatment in patients with CFS (Fulcher and White 1997; Whiting et al. 2001). Graded exercise with pacing has been associated with improvements in physical work capacity, and in specific psychological and cognitive variables in a randomized controlled trial with relaxation/flexibility therapy as comparison (Wallman et al. 2004).

26.3.2.3 Multidisciplinary Rehabilitation

An evaluation of a multidisciplinary intervention in Hamilton, Canada, for CFS (meeting the Fukada et al. definition) with long-term follow-up (Marlin et al. 1998) showed that of 51 treated patients, 31 returned to gainful employment, 14 were functioning at a level equivalent to employment, and 6 remained significantly disabled. Patients who had been treated showed good maintenance of gains. After a multidisciplinary assessment, the patients were offered a comprehensive multidisciplinary intervention that included (1) optimal medical management, (2) treating any ongoing affective or anxiety disorder pharmacologically, and (3) implementing a comprehensive cognitive-behavioral treatment program. The CBT component was individually tailored, but included (1) structured physical exercise and activation, (2) sleep management strategies, (3) careful activity management, (4) regulation of stimulant intake and reduction in the use of symptomatic medication, (5) cognitive intervention designed to deal with the patients' beliefs concerning the nature of their disorder, (6) participation of patients' families, and (7) efforts to establish specific vocational and non-vocational goals.

26.3.2.4 Adaptive Pacing Therapy

According to White et al. (2011), APT is based on the "envelope theory" of chronic fatigue syndrome. This theory regards CFS as a biologically driven "organic" disease process that is not reversible by changes in behavior and which results in a reduced and finite amount (envelope) of available energy. The aim of therapy is to achieve optimum adaptation to the illness. This adaptation is achieved by helping the patient to plan and pace activity to reduce or avoid fatigue, achieve prioritized activities, and provide the best conditions for natural recovery. In the study, APT was provided by occupational therapists. The background to the publication mentions that surveys by patients' organizations in the UK have reported that CBT and GET are sometimes harmful, and have recommended pacing and specialist health care. That randomized trial compared APT, CBT, and GET when added to specialist medical care and specialist medical care alone. When added to specialist medical care, CBT and GET had greater success in reducing fatigue and improving physical function than did APT or specialist medical care alone. The findings were much the same for participants meeting different diagnostic criteria for CFS, and for myalgic encephalomyelitis (ME).

26.3.2.5 Need for Support

The need for support in managing illness and maintaining social inclusion expressed by people with CFS/ME has been systematically reviewed (de Drachler et al. 2009). Thirty-two quantitative and qualitative studies, including the views of over 2500 people with CFS/ME, with mainly moderate or severe illness severity, met the inclusion criteria of the study. The following major support needs emerged:

- Making sense of symptoms and gain diagnosis
- Respect and empathy from service providers
- Positive attitudes and support from family and friends
- Information on CFS/ME
- Adjusting views and priorities
- Developing strategies to manage impairments and activity limitations
- Developing strategies to maintain or regain social participation

The distinction between CFS/ME and the burnout syndrome is important. This distinction requires a thorough medical investigation, particularly for women with CFS/ME, information about the disease, a thorough examination of functional impact, and realistic support regarding disability and prognosis. Clinical prognosis should be based on symptoms, patient history, and functional impairments and activity limitations. Improving capacity for retraining and work in women with CFS/ME should be seen as an important but limited part of the rehabilitative assessment. Focusing on individually tailored rehabilitation with a quality-of-life perspective and providing a realistic life situation taking account of chronic functional impairments and activity-level limitations continues to be a priority.

26.4 Gender Aspects on Work

Statistical data from 2010 show only a minor difference in gainful employment between Swedish women and men. Among women aged 16–62, 76 % were gainfully employed as compared to 82 % of men (Sweden Statistics 2011). The Swedish labor market is nevertheless strongly segregated along gender lines, in that women tend to work in certain areas, and men in others. The majority of women work in the public sector, and men in private companies. Of the 25 occupations where the risk of musculoskeletal disorders is most frequent, women are overrepresented in 18 and are much more frequently on sick leave than men. However, life expectancy at birth is still in favor of women; in 2009, it was 83 years for women and 79 years for men (Sweden Statistics 2010).

From the statistics perspective, one can conclude that the so-called gender paradox in terms of sickness and life expectancy also operates in Sweden, a country ranked as one of the world's most gender-equal countries according to the World Bank Global Gender Gap Report (World Economic Forum 2010). International research also shows that men return to work after sick leave more often than women, in both short-term and long-term follow-up studies (Enthoven et al. 2006; Lydell et al. 2005, 2009). Women with FM are 9.6 times less likely to return to work 1 year posttreatment, and those who do return are 4.3 times less likely to remain at work (Howard et al. 2010). Return to work after three different rehabilitation programs for patients with widespread pain (an extensive program vs. a light program vs. treatment as usual) was investigated by Skouen et al. (2006). The extensive program was associated with significantly fewer days absent for women. Among men, the light program was associated with more days absent from work compared to treatment as usual.

The "gender bias" phenomenon in medicine needs highlighting here. Risberg (2004) defined gender bias as "treating women and men differently (or the same) in an unjustified manner and/or as analyzing men and women in a skewed way." From research, it is obvious that both sexes are disadvantaged by this bias (e.g., Danielsson 2010; Hamberg et al. 2002; Risberg 2004). Women are, for instance, overdiagnosed with unspecified chronic pain, whereas men are underdiagnosed with depression: "it is more likely to require a physical finding to support diagnostic conclusion in male patients" (Katz et al. 2010).

Gender researchers in health science have investigated illness stories and medical discourses on gender and chronic pain. Werner et al. (2004) and Gustafsson et al. (2004) found illness stories revealing emotions of shame among women with chronic pain, due to the ways they were treated in the healthcare system. Werner et al. (2004) concluded that in the women's stories were accounts relating to medical narratives about the stereotype medical discourse of the "crazy, lazy, illness-fixed or weak woman."

From existing evidence of statistics and research it is difficult to discern whether a gender bias component is involved in return to work in FM and CFS/ME. However, to minimize the likelihood of women and men being treated differently in an unjustified manner in different situations and disorders, there is a need to integrate gender awareness into the medical and rehabilitation fields. Risberg (2004) defines gender awareness as "taking into consideration the role of gendered cultural norms and power differences between women and men in all kinds of social interaction as well as when theorizing about women and men" (Risberg 2004).

To conclude, it is crucial that therapists of all kinds are aware of gender as an important aspect of treatment outcomes, the potential of gender prejudice, as well as the power of relationships involved in the medical encounter, so that women and men are treated appropriately—without gender bias.

26.5 Important Factors Favoring Work Participation: Take-Home Message for Practitioners

Take-home messages relevant for management and return to work in FM and CSF/ME are indicated below with "FM+CFS/ME" in brackets, points only relevant for FM are indicated "FM," and points only relevant for CFS/ME are indicated "CFS/ME." For a woman with FM or CFS/ME, it is important at work to:

- Maintain balance in life among activities of daily living, work, leisure, and social participation (FM+CFS/ME).
- Maintain balance during the day—between activity and rest (FM).
- Avoid overexertion by maintaining balance between activity and rest (CFS/ME).
- Increase or develop body awareness and/or physical fitness (FM).
- Maintain or develop body awareness and/or physical fitness (CFS/ME).
- Set realistic limits to one's own and others' expectations and demands, as well as to when to ask for help (FM+CFS/ME).
- With a well-designed work situation, a woman with FM or CFS/ME might increase her work capacity.
- Experience a calm, low-stimulation, and low-stress environment (FM+CFS/ME).
- Receive support and understanding from colleagues and superiors (FM+CFS/ME).
- Have the option to work at a slower pace and/or take short breaks (FM+CFS/ME).
- Avoid heavy lifting and carrying (FM+CFS/ME).
- Avoid static muscle activity and repetitive movement (FM+CFS/ME).
- Avoid power grip and sustained manual working tasks (FM+CFS/ME).
- Have the opportunity to rest (FM+CFS/ME).
- Have flexible working hours (FM+CFS/ME).
- Have reduced working hours (FM+CFS/ME).
- Have flexible work tasks (FM+CFS/ME).
- Have variability in work postures (e.g., avoiding lengthy standing or sitting in the same position) (FM).
- Have the opportunity to interrupt or change work tasks when symptoms worsen (FM+CFS/ME).
- Be knowledgeable of how the disease influences the individual's work performance (FM+CFS/ME).

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27 Improving Return to Work in Cancer Survivors

Angela de Boer, Monique Frings-Dresen,
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27.1 Introduction

Early detection and advances in new and less invasive treatments have improved the prognosis for many cancer patients in recent years. A diagnosis of cancer has therefore for many people changed from a life-threatening disease to a chronic condition. While survival rates are on the rise, many living postprimary treatment for cancer experience long-term and late effects of their disease and treatment that can present challenges to both return to work and remaining at work for as long as they intended prior to diagnosis and treatment.

Many countries around the globe have recognized this rising public and occupational health burden. For example, since the number of cancer survivors has significantly increased over the past two decades in the USA there has been increased activity on the part of the federal government, professional organizations, and private general and cancer-specific foundations to improve the long-term health, function, and well-being of many types of cancer survivors (IOM 2005). The Council of the EU (Council 2008) recognizes, in their council conclusions on reducing the burden of cancer, that new cancer treatments improved and prolonged the life of cancer survivors, many of whom suffer from severe medical, psychological, or social consequences deriving from the diseases (EU). However, people disabled by cancer experience a broad array of physical, emotional, and cognitive disabilities that can impact their social and occupational integration (de Boer et al. 2008).

27.1.1 Incidence and Prevalence of Cancer

At a global level, the incidence of 26 cancer diagnoses in 2008 was estimated at 12.7 million new cases each year by the GLOBOCAN series of the International Agency for Research on Cancer (Globocan 2008), with over half of these cases (6.5 million) occurring in people of working age (15–64 years). For the age group 15–64 years, breast cancer was the most common with one million new cases, followed by lung cancer with 0.7 million cases, colorectal cancer with 0.5 million new cases, stomach cancer with 0.4 million cases, and gynecological cancer with 0.4 million cases. Looking to the future, the scale of global cancer incidence is forecast to increase

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from 12.7 million cases in 2008 to 14.9 million new cases in 2015 and 19 million new cases by 2025. In terms of prevalence (number of people alive with cancer at a particular point in time), survival up to 5 years after diagnosis has been a widely used benchmark because of its association with long-term survivorship. The worldwide 5-year prevalence was estimated as 28.8 million people living with cancer in 2008 (Globocan 2008). The total number of global cancer survivors is estimated to be approximately three times higher than this number because survivors who live beyond the 5-year survival point have been excluded from this estimate.

The National Cancer Institute in the USA reports that currently there are an estimated 11.9 million cancer survivors, of which 4.2 million (35 %) are included in the 5-year survival group. They represent approximately 4 % of the total population in the USA. Of these cancer survivors, 40 % are currently 65 years of age or younger and potential members of the national labor force. Among these survivors, the most common cancer includes female breast (22 %), prostate (20 %), colorectal (9 %), and gynecologic (8 %) (NCI 2012). Cancer is also a substantial social and public health problem in Europe. Each year, an estimated 3.2 million new cases of cancer are diagnosed in Europe, with half of them of working age (Ferlay et al. 2007). Cancer survival rates are going up (Verdecchia et al. 2009) and the number of people disabled by cancer is rising sharply. It is estimated that one in every 38 European citizens is a cancer survivor which is 2.6 % of the total European population (Micheli et al. 2002). Approximately 1.1 million cancer survivors live in the UK (Cancer UK 2011). As cancer is predominantly a disease of older age, the aging of the European population means that the number of survivors is predicted to continue to increase (La Vecchia et al. 2010). This pattern is similarly reported in the USA (Howlader et al. 2010).

27.1.2 Long-Term Effects: Physical, Mental, and Social

A new episode begins in the lives of survivors when cancer treatment ends. Some survivors may leave cancer behind and continue life with few or no problems. Others may enter an unexpected new phase of the experience of living with what is now often considered a chronic illness. This phase does not focus on treating the cancer itself. Instead, the new challenge may now be the need to manage a new life with long-term and late effects of cancer and/or its treatment (Harrington et al. 2010). A proportion of survivors experience physical, emotional, and social problems, such as fatigue, pain, cognitive deficits, anxiety, and depression, which may become recurrent or chronic. These long-term medical and psychological effects of cancer or its treatment may cause or contribute to various impairments that diminish social functioning, including obtaining or retaining employment (de Boer et al. 2009; Oberst et al. 2010).

More than one in four cancer survivors report high levels of symptom burden 1 year post-diagnosis, even after treatment termination (Shi et al. 2011). The physical, functional, and psychological long-term effects of cancer can also persist for many years following the first year posttreatment. Based on longitudinal and cross-sectional evidence, cancer survivors can experience symptoms for more than 10 years following treatment because of related treatments, such as chemotherapy, radiation therapy, and surgery (Harrington et al. 2010). Some examples of physical symptoms include lymphedema, cardiovascular problems, lung problems, and hearing loss. Breast cancer survivors can experience a series of postsurgical complications (e.g., lymphedema, scar tightness, and pain) that can influence function in limbs and specific work functions (Kärki et al. 2005; Tahan et al. 2010). Heart problems in cancer survivors are most often secondary to radiation therapy and/or chemotherapy. Some survivors may experience inflammation of the heart muscle or congestive heart failure (a condition where the heart has difficulty pumping blood). Chemotherapy may cause injury to the lungs and hearing loss as well. A number of cancer survivors experience persistent fatigue, sleep problems, and pain (Harrington et al. 2010).

Cancer-related fatigue has been described as the most common and debilitating symptom in patients with cancer (Spelten et al. 2002). It is defined as the feeling of extraordinary exhaustion associated with a high level of distress and is not relieved by sleep or rest. Prevalence rates range from 59 to nearly 100 % (Weis 2011). Except for chemotherapy-induced anemia, the mechanisms responsible for cancer-related fatigue are not yet completely understood. Therefore, it may be influenced by multiple possible somatic and psychosocial factors. Cancer-related fatigue has been shown as either a short-term side effect of adjuvant cancer therapy or a chronic long-term late effect (Weis 2011). One-third of all cancer survivors report fatigue as a long-term effect of cancer treatment (Spelten et al. 2002). Compared with other symptoms, such as pain or nausea, cancer-related fatigue is more distressing and often long lasting, with a strong impact on daily living such as employment and quality of life (Spelten et al. 2002).

Cognitive long-term and late effects include problems with working memory, learning, and executive function (planning and problem solving). Patient-reported cognitive limitations at work have been related to work output in breast cancer survivors (Calvio et al. 2010). Furthermore, cancer survivors often experience a variety of emotions, including depression and anxiety (Gordon et al. 2011), fear of cancer recurrence (Meyerowitz et al. 2008), anger, and isolation (Harrington et al. 2010). The fear of recurrence of the original cancer and/or development of new malignancies (which do occur) can strain emotional resources. Thus, long-term and late sequelae of cancer survival can have an effect on long-term social functioning, including the ability to work (Shi et al. 2011; Van der Mei et al. 2011).

27.2 Unemployment and Return to Work in Cancer Survivors

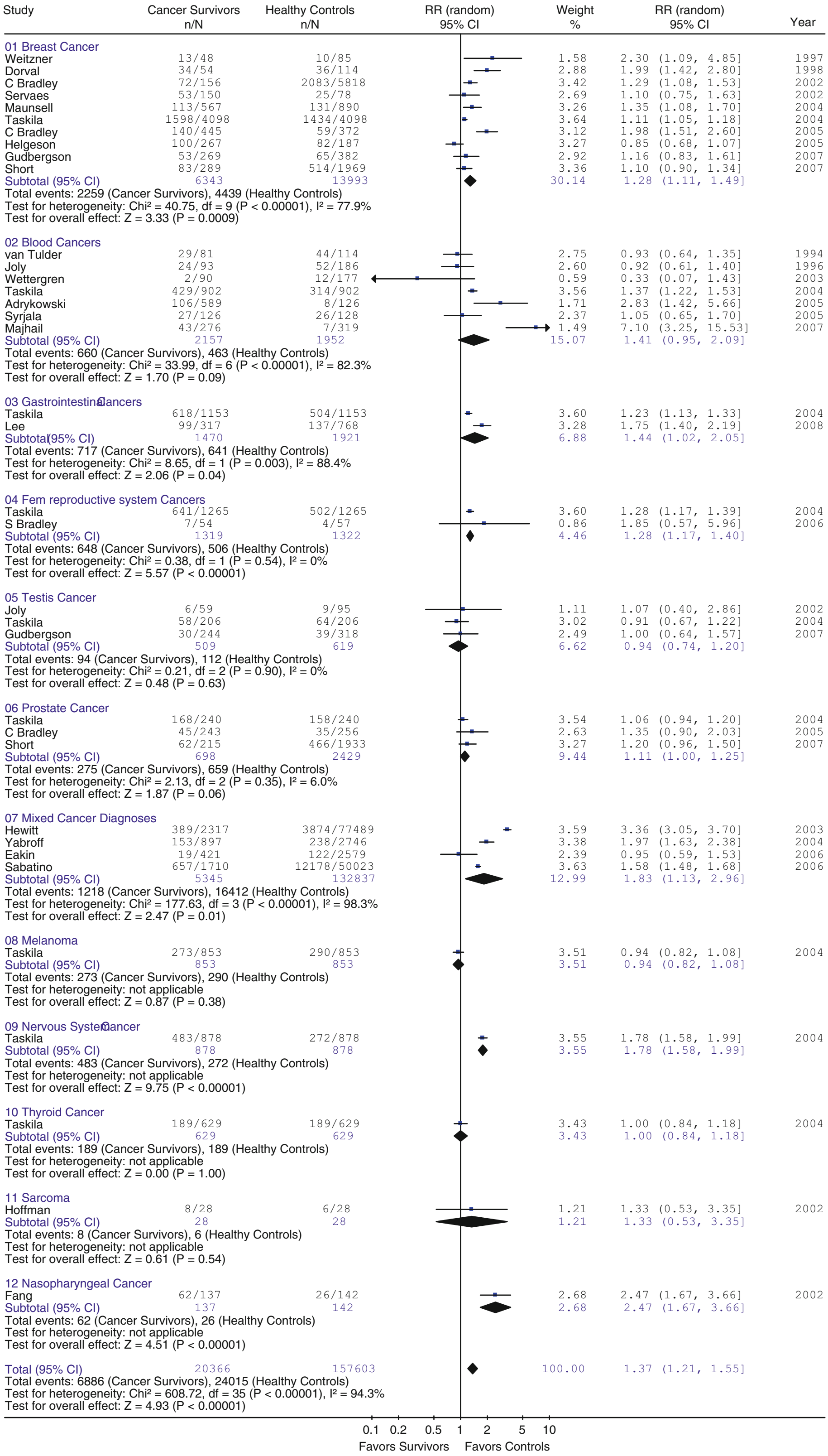
Almost half of cancer patients will experience a cancer diagnosis during an age when career and work-related issues play an important role in individual and family lives (Mehnert 2011). Most cancer survivors will want to resume work after treatment but not all survivors are able to do so and find the process of return to work difficult (McGrath et al. 2011). Returning to work is important for cancer patients, their families, and society. Patients often regard returning to work as a sign of complete recovery (Spelten et al. 2002) and regaining a normal life (Kennedy et al. 2007), while in Western aging societies, it is also an economic and social reality to encourage work participation whenever possible because of the forthcoming decline of the labor force.

27.2.1 Unemployment

In a previous meta-analysis on 20,000 cancer patients and almost 160,000 healthy control participants, we have shown that cancer survivorship is associated with unemployment. Our results demonstrated that cancer survivors have a 37 % higher chance of unemployment compared with healthy individuals (de Boer et al. 2009). Figure 27.1 shows the results of these meta-analyses for 12 different diagnostic groups. Additional meta-analyses by diagnosis groups showed an increased risk of unemployment for survivors of breast cancer (28 % higher chance), gastrointestinal cancers (44 %), and cancers of the female reproductive organs (28 %). The highest risk for unemployment was identified among survivors of nervous system cancer (78 %) and nasopharyngeal cancer (147 %), but these involved single studies only. Survivors of blood cancer (41 % higher, but not significant), prostate cancer (11 %), and testicular cancer (−6 %) did not have higher risks of unemployment compared to healthy controls. Cancer survivors are also at an almost threefold increased risk for unemployment because of disability or having a disability pension as compared to controls.

More recent studies have confirmed the higher unemployment risk for younger cancer survivors (age 28–54) in the USA (Moran et al. 2011), young gynecologic cancer patients in Italy (Bifulco et al. 2012), and female cancer survivors in Norway (Torp et al. 2012).

Obtaining employment appropriate to one's education and interests is an important and chal-



Study	Cancer Survivors n/N	Healthy Controls n/N	Weight %	RR (random) 95% CI	Year
01 Breast Cancer					
Weitzner	13/48	10/85	1.58	2.30 (1.09, 4.85]	1997
Dorval	34/54	36/114	2.88	1.99 (1.42, 2.80]	1998
C Bradley	72/156	2083/5818	3.42	1.29 (1.08, 1.53]	2002
Servaes	53/150	25/78	2.69	1.10 (0.75, 1.63]	2002
Maunsell	113/567	131/890	3.26	1.35 (1.08, 1.70]	2004
Taskila	1598/4098	1434/4098	3.64	1.11 (1.05, 1.18]	2004
C Bradley	140/445	59/372	3.12	1.98 (1.51, 2.60]	2005
Helgeson	100/267	82/187	3.27	0.85 (0.68, 1.07]	2005
Gudbergson	53/269	65/382	2.92	1.16 (0.83, 1.61]	2007
Short	83/289	514/1969	3.36	1.10 (0.90, 1.34]	2007
Subtotal (95% CI)	6343	13993	30.14	1.28 (1.11, 1.49]	
Total events: 2259 (Cancer Survivors), 4439 (Healthy Controls)					
Test for heterogeneity: Chi² = 40.75, df = 9 (P < 0.00001), I² = 77.9%					
Test for overall effect: Z = 3.33 (P = 0.0009)					
02 Blood Cancers					
van Tulder	29/81	44/114	2.75	0.93 (0.64, 1.35]	1994
Joly	24/93	52/186	2.60	0.92 (0.61, 1.40]	1996
Wettergren	2/90	12/177	0.59	0.33 (0.07, 1.43]	2003
Taskila	429/902	314/902	3.56	1.37 (1.22, 1.53]	2004
Adrykowski	106/589	8/126	1.71	2.83 (1.42, 5.66]	2005
Syrjala	27/126	26/128	2.37	1.05 (0.65, 1.70]	2005
Majhail	43/276	7/319	1.49	7.10 (3.25, 15.53]	2007
Subtotal (95% CI)	2157	1952	15.07	1.41 (0.95, 2.09]	
Total events: 660 (Cancer Survivors), 463 (Healthy Controls)					
Test for heterogeneity: Chi² = 33.99, df = 6 (P < 0.00001), I² = 82.3%					
Test for overall effect: Z = 1.70 (P = 0.09)					
03 Gastrointestinal Cancers					
Taskila	618/1153	504/1153	3.60	1.23 (1.13, 1.33]	2004
Lee	99/317	137/768	3.28	1.75 (1.40, 2.19]	2008
Subtotal (95% CI)	1470	1921	6.88	1.44 (1.02, 2.05]	
Total events: 717 (Cancer Survivors), 641 (Healthy Controls)					
Test for heterogeneity: Chi² = 8.65, df = 1 (P = 0.003), I² = 88.4%					
Test for overall effect: Z = 2.06 (P = 0.04)					
04 Fem reproductive system Cancers					
Taskila	641/1265	502/1265	3.60	1.28 (1.17, 1.39]	2004
S Bradley	7/54	4/57	0.86	1.85 (0.57, 5.96]	2006
Subtotal (95% CI)	1319	1322	4.46	1.28 (1.17, 1.40]	
Total events: 648 (Cancer Survivors), 506 (Healthy Controls)					
Test for heterogeneity: Chi² = 0.38, df = 1 (P = 0.54), I² = 0%					
Test for overall effect: Z = 5.57 (P < 0.00001)					
05 Testis Cancer					
Joly	6/59	9/95	1.11	1.07 (0.40, 2.86]	2002
Taskila	58/206	64/206	3.02	0.91 (0.67, 1.22]	2004
Gudbergson	30/244	39/318	2.49	1.00 (0.64, 1.57]	2007
Subtotal (95% CI)	509	619	6.62	0.94 (0.74, 1.20]	
Total events: 94 (Cancer Survivors), 112 (Healthy Controls)					
Test for heterogeneity: Chi² = 0.21, df = 2 (P = 0.90), I² = 0%					
Test for overall effect: Z = 0.48 (P = 0.63)					
06 Prostate Cancer					
Taskila	168/240	158/240	3.54	1.06 (0.94, 1.20]	2004
C Bradley	45/243	35/256	2.63	1.35 (0.90, 2.03]	2005
Short	62/215	466/1933	3.27	1.20 (0.96, 1.50]	2007
Subtotal (95% CI)	698	2429	9.44	1.11 (1.00, 1.25]	
Total events: 275 (Cancer Survivors), 659 (Healthy Controls)					
Test for heterogeneity: Chi² = 2.13, df = 2 (P = 0.35), I² = 6.0%					
Test for overall effect: Z = 1.87 (P = 0.06)					
07 Mixed Cancer Diagnoses					
Hewitt	389/2317	3874/77489	3.59	3.36 (3.05, 3.70]	2003
Yabroff	153/897	238/2746	3.38	1.97 (1.63, 2.38]	2004
Eakin	19/421	122/2579	2.39	0.95 (0.59, 1.53]	2006
Sabatino	657/1710	12178/50023	3.63	1.58 (1.48, 1.68]	2006
Subtotal (95% CI)	5345	132837	12.99	1.83 (1.13, 2.96]	
Total events: 1218 (Cancer Survivors), 16412 (Healthy Controls)					
Test for heterogeneity: Chi² = 177.63, df = 3 (P < 0.00001), I² = 98.3%					
Test for overall effect: Z = 2.47 (P = 0.01)					
08 Melanoma					
Taskila	273/853	290/853	3.51	0.94 (0.82, 1.08]	2004
Subtotal (95% CI)	853	853	3.51	0.94 (0.82, 1.08]	
Total events: 273 (Cancer Survivors), 290 (Healthy Controls)					
Test for heterogeneity: not applicable					
Test for overall effect: Z = 0.87 (P = 0.38)					
09 Nervous System Cancer					
Taskila	483/878	272/878	3.55	1.78 (1.58, 1.99]	2004
Subtotal (95% CI)	878	878	3.55	1.78 (1.58, 1.99]	
Total events: 483 (Cancer Survivors), 272 (Healthy Controls)					
Test for heterogeneity: not applicable					
Test for overall effect: Z = 9.75 (P < 0.00001)					
10 Thyroid Cancer					
Taskila	189/629	189/629	3.43	1.00 (0.84, 1.18]	2004
Subtotal (95% CI)	629	629	3.43	1.00 (0.84, 1.18]	
Total events: 189 (Cancer Survivors), 189 (Healthy Controls)					
Test for heterogeneity: not applicable					
Test for overall effect: Z = 0.00 (P = 1.00)					
11 Sarcoma					
Hoffman	8/28	6/28	1.21	1.33 (0.53, 3.35]	2002
Subtotal (95% CI)	28	28	1.21	1.33 (0.53, 3.35]	
Total events: 8 (Cancer Survivors), 6 (Healthy Controls)					
Test for heterogeneity: not applicable					
Test for overall effect: Z = 0.61 (P = 0.54)					
12 Nasopharyngeal Cancer					
Fang	62/137	26/142	2.68	2.47 (1.67, 3.66]	2002
Subtotal (95% CI)	137	142	2.68	2.47 (1.67, 3.66]	
Total events: 62 (Cancer Survivors), 26 (Healthy Controls)					
Test for heterogeneity: not applicable					
Test for overall effect: Z = 4.51 (P < 0.00001)					
Total (95% CI)	20366	157603	100.00	1.37 (1.21, 1.55]	
Total events: 6886 (Cancer Survivors), 24015 (Healthy Controls)					
Test for heterogeneity: Chi² = 608.72, df = 35 (P < 0.00001), I² = 94.3%					
Test for overall effect: Z = 4.93 (P < 0.00001)					

Fig. 27.1 Meta-analysis of unemployment risk of adult cancer survivors compared to healthy controls for 12 different diagnostic groups (de Boer et al. 2009). Reprinted by permission of the publisher

lenging life goal for anyone. It is even more significant for young survivors of childhood cancer, because they have their entire working lives ahead. Furthermore, Badell et al. (1998) found that the main concern in life was work for 19 % of the childhood survivors of bone marrow transplantation versus for only 2 % of their age-matched controls.

It may be especially difficult for young survivors of childhood cancer to obtain a job, given the possible long-term and late physical effects of childhood cancer, such as cardiovascular and pulmonary damage, scoliosis, fatigue or visual handicap, cognitive effects such as impaired attention, and the increased risk of depression or post-traumatic stress. We performed a meta-analysis on the risk of unemployment of adult survivors of childhood cancer compared to the risk of healthy controls. Results of a total of 24 controlled studies showed that survivors of childhood cancer were almost twice as likely to be unemployed than healthy controls (de Boer et al. 2006). Survivors of central nervous system (CNS) and brain tumors were almost five times more likely to be unemployed while the risks for survivors of blood or bone cancers were elevated but not statistically significant. If fortunate to find work, there is a genuine concern for possible job discrimination. For many types of illnesses, cancer survivors in the USA report more claims related to job retention, raises, promotions, and health insurance (Feuerstein et al. 2007b; Strauser et al. 2010) and Japan (Asami et al. 2012).

27.2.2 Return to Work

Numerous studies have been conducted since the year 2000 assessing return-to-work rates of cancer patients in many countries. A recent review by Mehnert analyzed 28 of these original studies. Overall, an average of 63.5 % of cancer survivors (range 24–94 %) returned to work depending on the time from diagnosis to work. Overall, studies indicated a steady increase of return to work from on an average 40 % at 6 months post-diagnosis to 62 % at 12 months, 73 % at 18 months, and to 89 % at 24 months after cancer diagnosis. The mean duration of absence from work was 151 days (Mehnert 2011). An earlier review by Spelten et al. of ten studies published between 1985 and 1999 reported similar return-to-work rates. They documented that 62 % of cancer patients (range 24–93 %) manage to return to work depending on the period of time following treatment (2002).

Although various studies have now investigated the return to work of cancer patients up to 24 months after diagnosis, very little information on midterm (2–5 years post-diagnosis) and long-term (≥5 years post-diagnosis) employment status or career paths of cancer survivors is available from any international study. One French study by Fantoni reported that 82 % of women who had worked before their breast cancer diagnosis returned to work at a median follow-up of 36 months (Fantoni 2010) after a median sick leave of 11 months. An American study showed that 84 % of leukemia or lymphoma patients were able to work 5 years after cancer diagnosis (Syrjala et al. 2004). Yet, the employment pathways of cancer survivors in general and those with specific cancers over the course of time remain largely unknown. Little is known either about the sustainability of employment after cancer survivors have actually returned to work. Sanchez et al. (2004) showed in a study performed in the USA that 81 % of those colorectal cancer patients who returned to work sustained their employment 5 years after diagnosis.

27.2.3 Other Work Outcomes

As return to work can be important to patients, their families, and society, the majority of studies that specifically address cancer and work outcomes have been focusing on the likelihood and timeliness of work return. The work participation of cancer survivors is typically assessed by measurements, such as the employment status (working yes/no) (de Boer et al. 2011), or the length of sick leave reflected in the number of days off work after diagnosis (Roelen et al. 2009). The actual performance of a cancer survivor once back at work has been infrequently measured.

Recently, this research area has evolved to also measure work productivity. Breast cancer survivors (Hansen et al. 2008) and brain tumor survivors (Feuerstein et al. 2007a) who were on average 3–4 years postprimary treatment self-reported significantly lower work productivity than their peers who had no history of cancer, while breast cancer survivors showed a mean reduction in productivity of 2.5 h of work over a 2-week period (Lavigne et al. 2008). In a large UK population-based study of 780 individuals with a previous cancer diagnosis, 1372 individuals with one or more of ten chronic conditions but no cancer, and 2740 individuals without a previous cancer diagnosis or chronic condition, it was found that cancer survivors were significantly more likely to report poor health outcomes than those with no history of cancer or a chronic condition. In addition, cancer survivors were more likely to indicate that their health had prevented them from working in their preferred occupation (19 % of cancer survivors versus 5 % of healthy participants) (Elliot 2011).

Other work outcomes following diagnosis and/or treatment for cancer have also been identified, including work ability, work productivity, work sustainability, and number of working hours (Feuerstein et al. 2010; Munir et al. 2009). Compared with other chronic conditions, both males and females with a recent history of cancer and its treatment are more likely to report higher work disability than those with heart disease, lung disease, stroke, arthritis, major depression, or panic disorder (Munir et al. 2009). Although studies show that those diagnosed with cancer who have relatively high work ability scores are most likely to be working during or following cancer treatment (de Boer et al. 2008), most cancer survivors continue to experience lower levels of perceived work ability compared to those without a history of cancer or those with other chronic conditions (on average 2 years post-diagnosis) (Munir et al. 2009). Cancer survivors with a recent history of breast cancer, malignant brain tumors, and stomach, prostate, colorectal, or testicular cancer reported either lower work productivity, impairments in physical and mental work ability, or reduced working hours compared to an employed comparison group with no history of cancer. Working hours for those with breast cancer are reduced when compared to a healthy comparison group (Munir et al. 2009). A recent study on a large group of younger age US cancer survivors showed that as long as 2–6 years after diagnosis, cancer survivors work 10 % (females) to 12 % (males) fewer hours than other similarly aged adults (Moran et al. 2011).

27.3 Factors Related to Unemployment and Return to Work

It should be emphasized that many cancer survivors are doing well in terms of employment, return to work, and work capacity. However, a substantial number of cancer survivors might benefit from help, advice, cancer-specific accommodations, and support on work issues. In order to know which patients need help, information is required on factors associated with return to work. Knowledge regarding these factors can also provide further input to the development of new, targeted interventions. In the studies published since 1985, the number of factors associated with return to work of cancer survivors has become more diverse, and more evidence has accumulated especially in the areas of sociodemographic and disease-related factors (Mehnert 2011).

27.3.1 Sociodemographic Factors

In terms of gender, women show lower return-to-work rates than men (Steiner et al. 2010; Mehnert 2011). This finding must be interpreted with caution as breast cancer is the most prevalent cancer diagnosis among women and the majority undergo aggressive treatment regimes. As a result of the long-term effects of these treatments, they are more likely to experience lower return-to-work rates (Mehnert 2011). Thus, other sources of support such as a husband's source of income might influence the decision to return to work. Women with breast cancer in Korea who lived with a spouse were more likely to quit working after treatment compared to women who had no spouse (Ahn et al. 2009).

On the other hand, young female survivors of childhood cancer face higher unemployment rates than young male survivors, but they are not survivors of breast cancer with the aggressive treatment regimes. Most prevalent cancer diagnoses in childhood are different from diagnoses in adulthood and include leukemia, lymphoma, sarcoma CNS, and brain tumors (de Boer et al. 2006), which are roughly equally distributed among boys and girls. One explanation could be that young female survivors of childhood cancer more often choose not to start working compared to males (de Boer et al. 2006).

With regard to age in general, four earlier reviews by Spelten et al. (2002; Mehnert 2011; Steiner et al. 2010; Taskila and Lindbohm 2007) found that older age had a significant relation with lower return-to-work rates. However, no differences in unadjusted unemployment risks or unemployment risk adjusted for country, diagnosis, and background unemployment rate were identified for older (over 50 years) compared to younger patients in our more recent meta-regression analyses. Also, patients who have a lower level of education are less likely to be employed than those who are higher educated (Mehnert 2011; Steiner et al. 2010; Taskila and Lindbohm 2007). Older and lower educated cancer patients might therefore need additional support in the return-to-work process and/or work retention.

27.3.2 Disease-Related Factors

27.3.2.1 Type of Cancer

It is very important to realize that the term cancer refers to a very heterogeneous group of diagnoses with a range of treatment modalities and cancer type-specific impairments. Return-to-work rates have been highly affected by this variation of diagnoses and treatments. For instance, a large population-based study by Taskila et al. (2004) involved all working age cancer survivors in Finland who were alive on December 31st 1997. Overall, she found a 50 % employment rate of cancer survivors compared to 55 % of age- and gender-matched referents. The employment rates did vary considerably according to different cancer diagnoses, with the lowest percentage of employed cancer survivors for lung cancer (29 % employed), multiple myeloma (32 %), cancers of the nervous system (43 %), and head and neck cancer (43 %). However, common cancer diagnoses such as breast cancer (54 % employed), lymphomas (51 %), and skin cancer (60 %) had employment rates that were only slightly below the rates of the matched controls.

27.3.2.2 Treatment

Treatment for cancer varies according to the site and stage of the disease and may involve surgery, chemotherapy, radiotherapy, and hormone treatment either alone or combined. Chemotherapy has one of the strongest associations with work outcomes and has been consistently linked to poorer work outcomes in comparison to other treatments in those working during or following cancer treatment, irrespective of cancer type (Munir et al. 2009). In a Dutch study, patients treated with surgery alone had the highest chance of returning to work quickly. Those who were treated with radiotherapy or radiotherapy plus surgery had a hazard ratio of 0.63, corrected for age and work ability, of returning to work and were thus 1.6 times more likely to stay off work than patients with surgery alone. Patients treated with chemotherapy, either alone or in combination with other treatment modalities, had 2.4 times higher risk of staying off work than patients treated with surgery alone, corrected for age and work ability (de Boer et al. 2008). Thus, cancer patients treated with chemotherapy run the highest risk of prolonged sick leave and might need the most support.

27.3.2.3 Fatigue, Depression, Anxiety, and Cognitive Function

Fatigue is increasingly recognized as one of the most common and distressing side effects of cancer treatment (Spelten et al. 2003) and has a significant impact on return to work and employability. Among those treated for cancer, the prevalence of fatigue or lack of energy experienced at work ranges from 22 to 94 % (Munir et al. 2009). Several studies have found that higher levels of fatigue are significantly associated with longer time to return to work or no return to work (Spelten et al. 2003; Pryce et al. 2007; Mehnert 2011). There is evidence for a significantly increased rate of depression or depressive symptoms in cancer survivors with many types of cancer during and soon after active treatment (Gordon et al. 2011). Persistent and recurrent (i.e., fluctuating) depressive symptoms are a problem for an important minority of cancer survivors. Furthermore, a substantial proportion of cancer survivors experience increased anxiety after treatment (Gordon et al. 2011) and this finding is often related to routine screening and follow-up (Richardson et al. 2011). The presence of depression and anxiety has been found to be a risk factor for unemployment and prolonged sick leave (Mehnert 2011; Spelten et al. 2003; Steiner et al. 2010).

Cancer survivors have reported deterioration in their ability to perform mental tasks, such as concentrating, learning new things, and analyzing data (Asher 2011; Correa and Ahles 2008; Wefel et al. 2011; Vardy 2009). Although findings vary with type of cancer, time since treatment, and the methodology used, a general trend toward decrements in functioning is found across cognitive domains, such as attention, concentration, information processing speed, executive functioning, and visual and verbal memory. These limitations can interfere with job performance, sometimes along fatigue and depressive symptoms (Boykoff et al. 2009; Todd et al. 2011). In a Dutch study, 15 out of 45 cancer survivors (33 %) with various diagnoses showed neuropsychological impairments covering various domains 12 months after the first day of sick leave. More cancer survivors with neuropsychological impairments (7/15, 47 %) than without (9/30, 30 %) were still on sick leave (Nieuwenhuijsen et al. 2009), one 18 months after diagnosis.

27.3.3 Survivor Perspectives

Recently, a number of qualitative studies have explored the views patients themselves have on important issues of cancer and work. Several psychosocial factors, such as poor coping and loss of confidence, have been described by patients as contributing to the difficulties experienced with work tasks and work interactions (Banning 2011). Previous studies have indicated that a non-cooperative work environment, decreasing importance of work, and severe physical and psychological side effects are important barriers for return to work (Tamminga 2012). In addition, temperament and personality functions, job issues, and societal attitudes can be experienced as barriers to return to work, while taking good care of one’s health, adequate coping skills, and support of family and health care professionals are seen as facilitators of return to work. After the return to the workplace, some breast cancer survivors felt that a wear-off effect of understanding from the work environment was a barrier for work retention (Tamminga 2012). Overall, many cancer patients believe that a return to work means that they are cured and life goes back to “normal” (Tiedtke et al. 2011). However, for other cancer survivors, thoughts of returning to work were associated with feelings of apprehension due to estimations of possible employment demands, and employer’s expectations regarding work schedules and the type of work employment that would be expected of them (Banning 2011).

27.3.4 Work-Related Factors

The type of work cancer survivors are engaged in and the environment they work in are important with respect to their ability to return to work and remain employed. Cancer survivors in manual, blue-collar occupations are less likely to be employed than cancer survivors who have white-collar jobs such as office work (Taskila et al. 2004). High physical demands at work are also a predictor of prolonged sick leave and, hence, workplace adjustments for this group of workers may assist in sustainable employability (Taskila et al. 2004). Perceived employer accommodations for cancer and treatments are strong and significant predictors for return to work (Spelten et al. 2002; Mehnert 2011; Steiner et al. 2010) and the importance of practical support from workplace and health care providers has been reported in some studies on cancer and work. According to a Finnish study on social support in the workplace and occupational health services, practical support was most needed from the supervisors in the form of taking illness into consideration when planning and managing the work tasks of a cancer patient. From occupational health personnel, support was especially needed in a form of evaluating the working conditions in the light of the cancer patient's ability to cope at work (Taskila et al. 2004). Notably, rehabilitation after cancer is routinely provided to all cancer patients in Germany. Perceived employer accommodation proved to be one of the most predictive factors of a successful return to work after such a rehabilitation program (Mehnert 2011). A return-to-work meeting with the employer as well as advice from a doctor about work are positively associated with return to work in cancer survivors (Pryce et al. 2007).

Few studies have taken into account the important influence of psychosocial work factors on the work ability of those working during or following cancer treatment (Munir et al. 2009). With regard to work adjustments and workplace support, Pryce et al. (2007) found that over half of those diagnosed with cancer disclosed their illness to their line manager but less than half received any work adjustment or support. This was the case for both those who were working during treatment and for those who had returned to work following sick leave, regardless of cancer type, disease stage, treatment, and symptom side effects. In a study by Taskila et al. (2004), those diagnosed with cancer received the most support from coworkers irrespective of cancer type. Women in general required more support from their supervisors and from occupational health professionals; and men who had lymphoma, had low education, or worked in blue-collar occupations also reported requiring more support.

In the return-to-work context, many women reported that employer's expectations of their work capacity varied (Banning 2011). Kennedy et al. found that employers could have been misled by the physical appearance of women, which may have indicated that they had completely recovered, but in many cases this impression was untrue and unrealistic. Consequently, many women encountered reduced sympathy and work-related support in terms of requested work adjustments (Kennedy et al. 2007).

Amir et al. (2008), Maunsell et al. (1999), and Johnsson et al. (2010) reported workplaces where cancer survivors were permitted modifications in their respective workload and working practices to support them in adjusting to their work situation. Yet, other studies reported that breast cancer patients were often refused employment modifications (Banning 2011). Difficulties with employer's understanding of the long-lasting effects of cancer on work are consistently reported as important barriers in gaining long-term support and work adjustments to help improve work ability. Such work adjustments and accommodations, including shorter work hours, flexible work times, and reduced demands, are only offered by some employers. Other employers make unwanted work adjustments such as a demotion or job role change. Finally, many employees have to ask themselves for work adjustments to be initiated, or have to make the work adjustments themselves to manage their work ability (Banning 2011). A qualitative study from Belgium reports that employers have to balance the interests of both the business and the employee making supportive return to work sometimes difficult (Tiedtke et al. 2011). In conclusion, work-related issues are important factors for cancer survivors in their return-to-work process.

27.3.5 The Role of Physicians

Specialized occupational health physicians play an important role in the sick leave management and support and advice on return to work of cancer survivors in many countries. In the UK, Amir surveyed 797 occupational physicians (response rate 51 %). Most respondents felt that managers treated referrals to occupational health (OH) differently for employees with cancer compared with management referral for employees with other diagnoses, with 45 % of respondents indicating that referral may take place too late to be effective in securing a return to work. A significant lack of understanding of the information requirements of employers and the role of OH by treating doctors was identified (Amir et al. 2009).

Two studies examined the performance of occupational physicians in the return-to-work process of cancer patients. In Finland, Taskila studied the amount of social support that 640 long-term cancer survivors had actually received from occupational health services. Most support was received from colleagues and the least from occupational health services. The patients, especially those who had received chemotherapy, indicated that they had hoped for more support from the occupational health services. The authors concluded that their study indicates a clear need to better organize occupational health services for cancer survivors (Taskila et al. 2004). Verbeek et al. (2003) measured the quality of care in a cohort of 100 cancer survivors 1–2 years after diagnosis and in their occupational physicians in the Netherlands. There was hardly any communication between the occupational physician and the treating specialists. In only 6 % of the cases, there had been a formal exchange of information. As to the continuity of care, most patients had seen the same physician but a follow-up was lacking, leaving almost 40 % without a new appointment. The authors concluded that the quality of care was reasonable, but that communication with the specialists was open for improvement.

These studies show that improvement of the care provided by occupational physicians creates the important opportunity of increasing support and advice for cancer survivors in their return-to-work process.

Support from oncologists and a medical system is essential for patients to continue working (Wada et al. 2012). In Japan, only half of the medical oncologists advised patients to tell their supervisors about prospects for treatment and to ask for understanding. In medical institutions in Japan, about a third had a nurse-involved counseling program and adjustments in radiation therapy and chemotherapy schedules to accommodate patients' work. Awareness of cancer treatment effects on work as well as behavior of oncologists are both important considerations that hospitals should take into account to support employed cancer patients. Hence, there is room for improvement in awareness and behavior of oncologists and support in medical institutions for cancer patients continuing to work. Notably, proactive development of support measures by medical institutions could alter the awareness and behavior of oncologists (Wada et al. 2012).

27.3.6 Legislation

Job discrimination, perceived employer discrimination, and difficulty combining treatment with full-time work may be major causes of unemployment (de Boer et al. 2009; Mehnert 2011; Steiner et al. 2010). Additional factors, such as the (high) prevailing unemployment rate in a specific country or region, could further increase the risk for survivors (de Boer et al. 2009). Our prior study showed that young adult survivors of childhood cancer in the USA are at a higher risk of unemployment compared to those in Europe (de Boer et al. 2008), possibly due to differences in social security systems and health care insurance.

In some European countries, the employer has the legal responsibility to make "reasonable adjustments" to allow continuing participation in employment. Line managers and supervisors play an important role in the return-to-work process of cancer survivors and supervisors themselves perceive their role in this process as important (Amir et al. 2010). Cunningham et al. (2004) however suggest that a "rhetoric-reality gap" may exist between desired organizational policy in terms of return to work and line managers' ability to put this into practice given the other constraints of their job. The legal requirements in the workplace for some type of protection because of a cancer disability are not applied uniformly across all chronic illnesses (Feuerstein et al. 2007b). Analysis of the Americans with Disability Act (ADA) claim patterns provide information that indicates cancer survivors in contrast to those employees with neurological, musculoskeletal, cardiovascular, and behavioral health problems, and report high levels of claims related to hiring and term or conditions, which include promotions and benefits. The apparent work discrimination faced by some employees with a history of cancer suggests that the work environment for cancer survivors can be less than supportive (Feuerstein et al. 2007b). A study by Park from Korea on 748 cancer patients shows that 6 % experienced discrimination in the workplace, and that reports of discrimination were significantly correlated with forced unemployment (Park et al. 2010).

27.4 Return to Work: Best Practices

Given the importance of employment for cancer survivorship and quality of life, it is necessary to provide employed cancer patients with programs to support the return-to-work process and/or work retention. In the past two decades, several interventions have been developed with approaches that were psychological (e.g., counseling), physical (e.g., physical exercise), vocational (e.g., encouragement to go back to work, job placement services, and vocational rehabilitation), occupational (e.g., educating employers, implementation of work adjustments), legislative (e.g., anti-discrimination acts), or multidisciplinary in their emphasis. In the US and the European regions, a number of programs to enhance labor participation of cancer survivors have been evaluated. These initiatives typically focus on supporting either the cancer survivor or the employer, or both. At this point, however, very few of these programs have been evaluated in randomized controlled trials or before-after studies (de Boer et al. 2011) but more and more are being developed and feasibility studies are on their way. Table 27.1 provides an overview of various levels of intervention which have been developed to enhance return to work and work retention in cancer survivors.

27.4.1 Psychological Interventions

Some interventions only included “counseling” such as the US study of Lepore et al. (2003) with men who have prostate cancer. One intervention, which only included patient education involving lectures delivered by an expert on such topics as physical side effects, stress, and coping, was compared with care as usual. In a second intervention group, group discussions to improve coping were added to the patient education and also compared to care as usual. Only the education plus group discussion group was effective in improving the return-to-work rate compared to normal care (Lepore et al. 2003). In Canada, breast cancer patients were offered brief psychosocial intervention from a social worker at initial treatment followed by monthly telephone screening of distress levels using a brief, validated instrument, with additional psychosocial intervention offered only to those with high distress at screening. However, the additional telephone screening and psychosocial intervention did not improve return-to-work rates compared to a group of control breast cancer patients (Maunsell et al. 1996).

27.4.2 Physical Interventions

Several physical intervention programs have been developed for cancer survivors to improve physical activity and reduce fatigue (Duijts et al. 2011; Fong et al. 2012; Speck et al. 2010). Physical activity has positive effects on physiology, body composition, physical functions, psychological outcomes, and quality of life in patients after treatment for cancer (Duijts et al. 2011; Fong et al. 2012; Speck et al. 2010). However, not many of them have included work-related outcomes. The physical interventions included a moderate walking program executed in the USA (Rogers et al. 2009). This training

Table 27.1 Interventions to enhance return to work and work retention in cancer survivors

Intervention type	Author	Country	Content
Psychological	Maunsell	Canada	Screening + psychosocial counseling
	Lepore	USA	Patient education and group counseling
Physical	Rogers	USA	Discussion group, home-based exercise
	Purcell	Australia	Fatigue education
	Thijs	The Netherlands	In-hospital exercise training
Vocational	Rio Suaerez	Spain	Job placement program for cancer survivors
	Kyle	UK	Case manager
	Strauser	USA	Vocational rehabilitation services
	Hensel	Germany	Inpatient rehabilitation
Occupational	Macmillan	UK	Employers' guide to manage cancer in workplace
Legislative	Paraponaris	France	Protective labor law
	Feuerstein	USA	Americans with disabilities act
	Sharp	Ireland	No protective labor laws
Multidisciplinary	Maguire	UK	Counseling, physical activity, vocational advice
	Berglund	Sweden	Information, physical training, coping skills
	Nieuwenhuijsen	The Netherlands	Vocational advice, enhanced doctors' communication
	Tamminga	The Netherlands	Counseling, vocational advice, doctors' communication
	Bains	UK	Education, vocational advice, managing symptoms

program included an individually supervised exercise session, face-to-face counseling sessions with an exercise specialist, and home-based exercises. No effects on return-to-work rates, however, were found (Rogers et al. 2009).

The use of education is recommended to teach patients self-care behaviors to reduce cancer-related fatigue. In Australia, an educationally based cancer-related fatigue intervention trial, CAN-FIT, aimed to reduce severity of fatigue in radiotherapy patients. Patients received either pre- or post-radiotherapy fatigue education and support or both. The intervention was however not associated with reduction in fatigue levels at any assessment point. The program was associated with higher activity levels. Pre-radiotherapy education and support were associated with slower return to paid work and post-radiotherapy and support were associated with decreased levels of unpaid work compared with no fatigue education and support (Purcell et al. 2011).

Possibly, the activities that were involved in the fatigue education and support program and the walking program were not vigorous enough to improve fatigue and return to work or support alone is not enough to induce long-lasting higher activity levels. In a study in the Netherlands, cancer patients who had received chemotherapy were followed during a high-intensity physical exercise sport program. This in-hospital program lasted for 18 weeks and included strength and interval training and home-based activities. Results revealed that time until (partial) return to work was 11.5 weeks for the intervention group versus 13.2 weeks for the control group who did not participate in the program. On long-term follow-up, 78 % of the participants from the intervention group versus 66 % from the control group had returned to work at the pre-diagnosis level of working hours (Thijs et al. 2011).

27.4.3 Vocational Interventions

Several countries have special vocational services or rehabilitation programs for people with disabilities or a chronic disease, sometimes specifically aimed at cancer patients. In Spain, the Spanish Association Against Cancer (AECC), in coordination with the Employment Service in Andalusia, has implemented a Job Placement Program to promote socio-labor integration of cancer patients since 2005. In this program, it is stressed to address modulating factors in the job placement process, especially those related to cancer, such as psychological factors. For an early detection of those factors, an adapted Job Placement Psychological Factors' Questionnaire was employed. The analysis of these factors, along with a customized employability diagnosis, informs the adoption of specific return-to-work intervention strategies for each cancer patient. The program's job placement was 62.5 % (Rio Suarez et al. 2010).

Both in the UK and the USA, vocational rehabilitation services for patients with cancer are available and currently being evaluated. In Scotland, patients receiving employment support are allocated a "case manager." He or she conducts a telephone assessment of supportive care needs to facilitate remaining in or returning to work. Based on this initial assessment of each individual's personal goals and health status, the case manager assigns participants to appropriate support services including physiotherapy, occupational therapy, an occupational health nurse, an occupational health doctor, counselor/psychological therapy, or complementary therapy. Each individual may therefore receive a different (combination of) intervention(s). The effects of this intervention are evaluated in a pilot randomized trial (Kyle et al. 2011).

Young adult cancer survivors have lower levels of occupational development and are less ready to pursue employment when compared to their non-cancer survivor counterparts. In the USA, vocational services are offered to young cancer survivors although very few of them are involved in the state-federal rehabilitation program (Strauser et al. 2010). Despite this issue, the provision of certain vocational rehabilitation services is related to increased employment in this group. Those who received job search assistance and on-the-job support were four times more likely to be employed following such services (Strauser et al. 2010).

In Germany there is a long tradition of rehabilitation since the 1970s. Every patient with a malignant disease is entitled to receive an inpatient oncologic rehabilitation program provided by specialized facilities. The cancer rehabilitation program lasts for 3 weeks and follows a multidimensional therapeutic approach that includes patient education, exercises, and physical therapy to regain physical fitness and vitality, relaxation training, psychosocial counseling, and psychosocial support groups to enhance coping skills, as well as individual psychotherapy (Mehnert 2011). Participation is voluntary and health insurance providers encourage their members to participate, with the intention of improving the rate of reintegration into professional life. However, in a non-randomized study, Hensel et al. (2002) found that employment status and return to work were similar in patients who participated in a rehabilitation program and those who did not.

27.4.4 Occupational Interventions

Line managers and employers should be supported as well to help their employees affected by cancer. Because, for instance, 73 % of employers in the UK had no formal policy for managing employees diagnosed with cancer just one-third of organizations ensured that relevant staff had a good understanding of cancer and the impact of treatment on an individual's working role. The consequence of lack of policy, knowledge, and support within UK companies is that insufficient support and information are made available by employers to employees with cancer (CIPD 2006). Furthermore, line managers treated referral to occupational health physicians differently for employees with cancer compared to employees with any other chronic conditions, with 45 % of respondents indicating that referral may take place too late to be effective in securing a return to work because referral by line managers has not been made at a sufficiently early stage (Amir et al. 2009). To overcome these barriers, the Danish Cancer Society is supporting employers by developing an employer's guide containing information, legislation, and practical advice about how to support employees affected by cancer. The guide is currently being adapted for other European countries. A similar guide has been developed by MacMillan Cancer Support in the UK. It contains practical advice about how an employer can support employees affected by cancer, including their responsibilities as an employer and their employees' rights. So far, neither guide has been evaluated (Macmillan 2012).

27.4.5 Legislative Interventions

Despite protective labor law and favorable health insurance arrangements, French cancer survivors continue to experience problems remaining at work or returning to the labor force (Paraponaris et al. 2010). Measures targeting only the employment protection of cancer survivors do not seem to be sufficient to mitigate social inequalities in job attainment. These data stem from an interview study on a representative sample of 4270 French individuals older than 17 and younger than 58 years when diagnosed with cancer in 2002 and interviewed 2 years later. Overall, 66 % of the cancer survivors who were working at the time of diagnosis were still employed 2 years later. Self-reported work discrimination was common despite legislative measures and workplace discrimination increased the probability of job loss by 15 %.

Cancer-related discrimination usually stems from an employer's misunderstanding of cancer and its treatments, beliefs in myths or stereotypes about cancer, or incorrect assumptions about what cancer survivors can or cannot do on the job. Cancer survivors are protected by federal laws that include the Americans with Disabilities Act (ADA) and the Family and Medical Leave Act. Feuerstein investigated the pattern of ADA disputes among cancer survivors and non-cancer-related impairments and analyzed 59,981 cases over a 6-year period (Feuerstein et al. 2007b). Results showed that cancer survivors are more likely to file job loss claims and differential treatment related to workplace policies. Furthermore, those with cancer and another impairment file more claims related to relationship problems at work than cancer only (Feuerstein et al. 2007b).

Sharp and Timmons (2011) investigated employment outcomes among 1373 breast and prostate cancer survivors in Ireland, where sick leave and sick pay are at the employers' discretion and the law affords no protection against dismissal following extended absence. The high level of workforce departure (18 %) and associations between self-employment, sick pay and medical cards, and employment outcomes suggest that social welfare and legal provisions are important determinants of the survivors' workforce participation.

27.4.6 Multidisciplinary Interventions

Multidisciplinary interventions include several modules of interventions such as physical, psychological, and vocational modules (Pransky et al. 2011). In a recent Cochrane review, the effects of intervention studies that used randomized controlled trials (de Boer et al. 2011) were reported. Evidence showed that multidisciplinary interventions involving physical, psychological, and vocational components led to higher return-to-work rates than care as usual. Two of the effective multidisciplinary interventions were executed by an oncology nurse in a hospital setting (Maguire et al. 1983; Berglund et al. 1994). Overall, few European interventions have been developed and evaluated which enhance return to work in cancer patients. One of the first was the study by Maguire et al. in the UK, performed in the early 1980s (Maguire et al. 1983). In this study, performed in the university hospital of South Manchester, a specialist nurse was appointed to counsel patients undergoing mastectomy and monitor their progress after discharge. Breast cancer patients were advised on exercise, encouraged to return to work and become socially active, and counselled on feelings. The nurse started the intervention in hospital early after surgery and followed up with the patients every 2 months to monitor their progress until the patients adapted well. Twelve to eighteen months after surgery those helped by the nurse showed a greater social recovery, return to work, and adaptation to breast loss than those without the nurse's support (75 % versus 54 %, respectively). This study showed that advice on return to work can be given very early on in the treatment process and that reintegration to work could already start within the hospital setting.

Berglund et al. (1994) developed an intervention in Sweden for breast cancer patients in which they received information and performed physical training, supplemented by training in coping skills. An oncology nurse specialized in psychosocial issues conducted the group training during all sessions. Patients in the program improved significantly more than the controls with respect to appraisal of having received sufficient information and return to work.

Other studies have investigated multidisciplinary interventions enhancing return to work of cancer patients without a randomized controlled trial design. Given the evidence that early advice on return to work in a hospital setting is feasible and effective and that communication between attending and occupational physicians should be improved, a pilot intervention study was conducted in the Netherlands. Nieuwenhuijsen et al. (2006) aimed to enhance communication between attending and occupational physicians by sending copies of two letters containing information on diagnosis, treatment plan, and outcome of treatment from the treating radiotherapist to the occupational physician. Additionally, cancer survivors and occupational health professionals received a leaflet with practical guidelines on how to return to work. The leaflet described a detailed ten-step plan for return to work based on principles of graded activity and goal setting. Examples of recommended actions included the following: make an appointment with your occupational physician or make sure that the return-to-work plan encompasses the date and number of hours of the start and on which days of the week you will work. Almost all patients (96 %) scheduled an appointment with their occupational physician, all patients maintained contact with their colleagues and employer, and most patients (62 %) drew up a detailed return-to-work plan, but only 15 % drew up a second, less ambitious return-to-work plan. However, there was no effect of level of adherence on actual return to work, perhaps because of the small sample size of $n = 26$.

In a more recent intervention, a psycho-oncology nurse supported cancer patients with their return to work in a work-directed intervention consisting of the following: (1) four meetings with a nurse at the treating hospital department to start early vocational rehabilitation and supply work-related and legal information; (2) one meeting with the participant, occupational physician, and supervisor; and (3) letters from the treating physician to the occupational physician to enhance communication (Tamminga et al. 2010). The effectiveness study of this intervention is ongoing.

In the UK, a program has been developed in which patients are provided with an educational leaflet and a face-to-face return-to-work consultation. This included advice and guidance on managing symptoms at work, communication with employer, and information on work ability during and after treatment. This advice is tailored according to work type (manual versus non-manual). Most participants found key aspects of the intervention useful. In particular, information and advice on the impact of treatment upon work ability are considered most valuable (Bains et al. 2011).

27.5 Future Research and Practice

Maximizing opportunities for cancer survivors to return to work and remain working is a significant concern for patients, employers, and society. Future improvements in cancer treatments and the aging society will most probably increase not only the number of cancer survivors but also their ability to work during and following treatment. Research is therefore urgently needed to address factors related to return to work and employment, and into development and evaluation of new interventions to support return to work, employment, and positive work outcomes.

27.5.1 Developments in Return to Work and Unemployment

Whether the employment rates for cancer survivors will increase, decrease, or remain the same is unknown. On the one hand, there is a drive toward maintaining steady workforce levels in countries of the Western world due to the aging society and increasing pension age. Thus, cancer survivors may have a greater chance of employment than in former years. On the other hand, the current global recession and financial hardship might marginalize the cancer survivor in the workplace, especially those who experience cancer diagnosis and treatment-related long-term and or late effects that may influence work performance. As we found in our earlier meta-analysis, cancer survivors are the first ones to become unemployed in times of economic difficulties and high unemployment rates. Thus, cancer survivors will need more cost-effective ways to improve employment. There is a need for proactive approaches to facilitate employment and work retention. Also, ongoing research on large cohorts of cancer patients to monitor their return to work and employment status is of great importance in order to show if vulnerable subgroups do emerge. Moreover, very early in the treatment process of cancer patients, attention should be given to return to work and work retention issues because many patients already experience work-related problems around the time of diagnosis (de Boer et al. 2011). During diagnosis and treatment, information and support on work-related issues should be offered to patients with cancer as an essential part of high-quality oncological care.

Symptoms generally improve over years post-treatment but residual symptoms in some cancer survivors may persist at a level interfering with work ability and work retention. A person might physically or emotionally not be able to work or is not motivated to return to work. Also, certain components of jobs due to limitations in physical function, persistent or recurrent pain, fatigue, depression, cognitive difficulties, and functional limitations due to lymphedema may pose barriers to return and remain at work. With regard to the employment status of cancer survivors, hardly any prospective information on midterm (2–5 years post-diagnosis) and long-term (≥5 years post-diagnosis) employment status of cancer survivors is available. Hence, the employment pathways of cancer survivors over the course of time are unknown. Such information can be important in the psychosocial survivorship care of cancer patients. Health care professionals who counsel and advise cancer patients would be able to use such information. In the development and update of oncological guidelines on oncological revalidation or cancer and work, outcomes on the employment pathways of cancer patients can be incorporated. For example, the Lance Armstrong Foundation and American Cancer Society recently created “The essential elements of cancer survivor care,” using an expert consensus approach. In the essential elements of cancer survivor care there is rehabilitation for late effects including a work element that represents a critical area providers need to focus on (Livestrong 2011). In Canada, a pan-Canadian guideline to provide survivorship services for adult cancer populations has been developed. The evidence-based guidelines conclude that the end-of-treatment consultation should link individuals to employment counseling, in coordination with the primary care provider, depending on the issues or concerns identified (Howell et al. 2011).

Finally, based on the assessment of prognostic factors of midterm employment status, specific subgroups at higher risk of deteriorated employment can be selected and given additional care. In this way, quality of life can be improved by preventing work loss and distress.

27.5.2 What Interventions Could We Develop?

At present, most solutions to problems of work and cancer are based upon a generic understanding of chronic illness and work, or on information on musculoskeletal illness and other illnesses such as arthritis and cardiovascular disease. While we can build off of the existing work disability prevention knowledge base, there is a need to customize evaluation, intervention, and workplace accommodation efforts to certain unique characteristics of cancer survivors. A comprehensive conceptualization of cancer survivorship and work can potentially guide the evaluation, prevention, and management of survivors who experience problems returning to and/or remaining at work. Such efforts could also assist those with cancer-related problems maintain or enhance their abilities at work. Recently, Feuerstein et al. (2010) specifically developed a cancer-specific model with both a framework for future research and attention to clinical and workplace application.

27.5.2.1 Overall Perspective

Feuerstein's model identifies a set of eight areas that represent personal, macro-, meso-, and micro-levels. Clinicians and others involved in preventing, evaluating, and managing work-related problems among cancer survivors can use this framework to help address these problems to develop and evaluate interventions and their impact on work outcomes (Feuerstein et al. 2010).

Figure 27.2 illustrates an evidence-based model (i.e., based on research on factors related

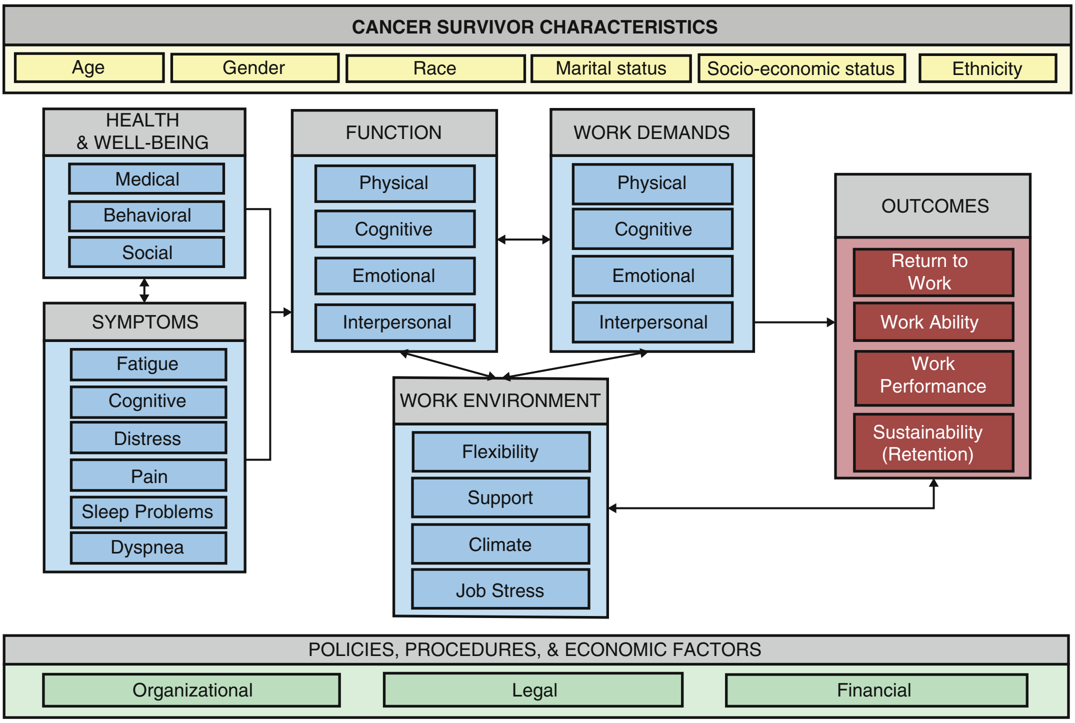


Fig. 27.2 Cancer and work model (Feuerstein et al. 2010). Adapted with permission of Springer

to work disability among cancer survivors) that can help guide evaluation of workers with cancer, prevention of long-term work disability, and interventions to reduce days lost and enhance productivity for cancer survivors (Feuerstein et al. 2010).

27.5.3 Health and Well-Being

This section of our chapter is related to the World Health Organization definition of health that includes not only medical health, but also behavioral health and social health. This conceptualization implies that the cancer survivor needs a level of health and well-being that will help the individual focus on other elements that can optimize work outcomes. While this may be obvious, it seems essential to make certain that a basic level of health is necessary prior to focusing on other components of the conceptual framework that may influence various work outcomes. Comorbidities in health problems (cancer and arthritis or cardiovascular illness of some type) sometimes create additional problems at work indicating that those with multiple health problems will need closer attention to not only health problems but also difficulties in the workplace.

27.5.4 Symptom Management

An approach that identifies the cancer survivor's residual symptoms related to the cancer and/or its treatment that are potentially modifiable, such as fatigue, cognitive problems, distress, pain, sleep problems, dyspnea, or other symptoms that are inferring with function, is also an area that needs more attention. The distress thermometer and symptom list is a simple screening tool that can be used by many who work with cancer survivors throughout the world (Snowden et al. 2011). The use of this measure can trigger a more complete evaluation of symptoms and their association with work. When an individual reports or experiences a problem in any of the four work outcomes indicated at the far right end of the model, an appropriate intervention or a set of interventions targeted at the specific set of symptoms may be appropriate. Currently, interventions that target symptoms and reductions in work productivity persisting for years postprimary treatment are lacking. Since cancer survivors can experience long-term effects chronically, there is a great need for such interventions.

27.5.5 Physical Interventions

Physical interventions focused on improving strength, flexibility, endurance, and pain relief represent another area that may require attention. These interventions can include work with a physical therapist, occupational therapist, and exercise physiologist. However, depending on the extent of the discrepancy between what the cancer survivor can do at a current point versus what they will need to do in their job may simply require coordination in a fitness facility. Of course, clearance from the survivor's physician should be obtained prior to that route.

27.5.6 Occupational and Vocational Interventions

Very few interventions for cancer survivors are currently aimed at the workplace. As indicated above, rehabilitation interventions that focus on minimizing the discrepancy between physical capacity and work demands are important but depending on whether the cancer survivor has a job to return to or not, vocational counseling, job selection, and job coaching could be helpful. Vocational intervention may also assist with realistic job accommodations to which both the employer and employee can adjust.

Collaboration between employers and employees is often lacking. Programs that aim to improve the supervisor and/or coworker support, as well as other aspects of the workplace climate and job characteristics, such as job flexibility and autonomy (likely involving some workplace consultation), may also be warranted in cases where workplace issues constitute an identifiable problem area. Attention to any clusters of cancer survivors or others with chronic illness experiencing problems at a certain company or work field could indicate problem areas. When present, these problem areas might suggest that a larger organizational level intervention might be recommended.

27.5.7 Legislative and Policy Interventions

Although legislation and policy are not much of a concern for the practitioner trying to help the cancer survivor to return to work, they nonetheless need to be addressed as a potential barrier to positive work outcomes. There are many stakeholders that might be involved in improving a return-to-work outcome for cancer survivors. Information related to the need for cancer survivors to be aware of the support that company human resource services, health care services, community oncology groups, and insurance and social net representatives (insurance, social agencies, government) provide is important.

27.5.8 Multidisciplinary Interventions

Although most persons with a chronic illness leading to work disability go back to work after recovery, a percentage experience prolonged work absence. These complex situations have led to the development of multidisciplinary intervention programs, targeting the range of factors that contribute to the work disability problem (Pransky et al. 2011). Over the last 20 years, the literature related to work disability and multidisciplinary interventions has enormously evolved (Bültmann et al. 2009; Joosen et al. 2011; Pransky et al. 2011; Schakenraad et al. 2004). The knowledge and experience from studies conducted in other chronic illnesses may be very applicable to cancer survivorship (Boot et al. 2011). Multidisciplinary interventions evaluated in other chronic conditions need to be seriously considered because there may be many similarities in factors related to work outcomes (Munir et al. 2007) that we can build upon, as well as many interventions or at least knowledge of various stakeholders that we can use or model new interventions after. Although it is more likely that variations in models and interventions will need to be developed for cancer patients, many of the research and intervention approaches for other chronic illnesses may apply as well.

Integrative or multidisciplinary approaches target improvements in health and symptoms, assess areas of function—physical, cognitive, emotional, and interpersonal—in relation to the functional levels workers need to do their jobs, and look at work environment factors, such as supervisor support, level of perceived stress, overall work climate, flexibility on the job, and, if possible, also financial needs (Pransky et al. 2011). It is more common to coordinate elements of this integrated approach rather than offering these options at one center or clinic. Attention to problem areas identified during an evaluation can be referred to the appropriate health provider or vocational expert. Organizational intervention is an option as well, particularly if there is a pattern of work-related problems related to some policy or workplace culture. This approach requires that problems are identified and triaged to health care providers: physicians with various specialties, occupational physicians, occupational nurses, social workers, vocational rehabilitation experts, as well as specialists in physical therapy, cognitive rehabilitation, or neuropsychology, among many others.

Realistically, an individual will not experience problems in all areas of the model. For the targeted outcome of interest, the evaluation should also include direct referral to those who are best suited to address the specific problem area. This approach requires empirical support via intervention studies including RCTs. However, at present it provides a framework for considering the many factors that can influence return to work, work ability, work sustainability, and performance at work.

27.6 Conclusion

Globally, the number of cancer survivors is growing rapidly. Many experience long-term effects of diagnosis and treatment for cancer. One important aspect of a long-term effect of cancer is diminished work ability, a greater chance of unemployment, and prolonged sick leave. To support cancer survivors in their return to work and work retention, several interventions have been developed and tested in the last decades. Multidisciplinary interventions have proven to be most successful. More interventions are needed at the workplace itself and involve employers and programs aimed at long-term cancer survivors. In order to provide supportive return-to-work and work sustainability interventions to those who need them most, screening instruments to detect cancer survivors at high risk should be used more often. Finally, up-to-date interventions such as e-health, social networks, and portable smartphone applications for workplace-specific information and interventions may prove useful in the future.

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Return to Work Following Major Limb Loss

28

Jacqueline S. Hebert and Helena Burger

28.1 Introduction

Major limb amputation has a sudden dramatic impact on an individual's functioning and quality of life. Whether the amputation is due to unexpected injury, or due to a protracted course of illness with preceding limitations in the time frame leading up to the amputation, the outcome includes permanent impairment. Loss of limb can have a major impact on an individual's function, and their ability to participate in vocational and avocational activities, including return to work.

The rate of amputation has been examined in several epidemiological studies, and depends on whether incidence or prevalence is being examined, and whether it is reliant on population study or hospital discharge data. Dillingham et al. (2002) looked at hospital discharges in the USA and found the amputation incidence rate in 1996 for the lower limb of 47 per 100,000, and for the upper limb 5 per 100,000. With respect to etiology, for lower limb amputation the most common cause was dysvascular disease at 44.9 per 100,000, followed by trauma related (2.1 per 100,000) and cancer related (0.24 per 100,000). Of upper limb amputations, 3.8 per 100,000 were trauma related, 1.3 per 100,000 were dysvascular related, and less than 1 in 100,000 were cancer related. The incidence of dysvascular disease as the most common cause of amputation overall was shown to be on the rise for the study period (Dillingham et al. 2002). This is consistent with other studies indicating that the prevalence of major limb amputation is on the increase overall due to the epidemic of diabetes and dysvascular disease (Ziegler-Graham et al. 2008). Population-based studies worldwide were summarized by Ephraim et al. (2003), and show a large variation in rates of amputation among nations, from a low of 0.2 per 10,000 in Japan to a high of 4.4 per 10,000 in Navajo region of the USA, with a consistent effect of diabetes having a significant influence on the incidence of amputation.

Rehabilitation following amputation focuses on restoring body function (with prosthetic replacement if possible), decreasing limitations in activity, and facilitating participation and reintegration to community, which includes return to work. Returning to work is an important factor in enhancing self-esteem and reducing social isolation for persons with disability (Dougherty 1999). Full-time employment leads to beneficial health effects such as slower decline in physical functioning (Ross and Mirowsky 1995). It follows that the known health economic impacts of

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amputation (Bondurant et al. 1988; Peacock et al. 2011) can have additional impacts on the work economy due to reduced ability to return to work, particularly if the amputation occurs in a younger person in his or her productive years of employment (Smith et al. 2005; Saddawi-Konefka et al. 2008). Certainly, work-related injury leading to amputation has been shown to have significant economic costs (McCall and Horwitz 2006).

Studies regarding return to work following amputation date back to 1955 (Boynton 1955), with a multitude of studies in recent decades across the world summarized in recent reviews (Burger 2010; Burger and Marinček 2007). However, evidence-based guidelines on capability of return to work and the optimal process to facilitate return to work mainly rely on studies of predictive factors, rather than intervention-based studies with employment as the primary outcome (Schoppen et al. 2001a, b). Therefore planning for return to work is typically based on expert opinion and individual assessment.

In order to effectively assess capability to return to work following amputation, an understanding of the limitations of various levels of amputation and the factors associated with amputation outcome is required. This is best done within the construct of the International Classification of Functioning, Disability, and Health (ICF), which categorizes changes in body function and structure, activity limitations, and participation restrictions, as well as considering the impact of personal and environmental factors on outcome from a given health condition (WHO 2001; Xu et al. 2011). Once the limitations and potential impacts are understood, then interventions can be targeted for the individual person following amputation to maximize potential to return to work.

28.2 Lower Limb Amputation

28.2.1 Consequences from an ICF Perspective

After amputation of the lower limb, activity limitations and participation restrictions are generally related to mobility. Persons with lower limb amputation will have problems standing, walking, running, kicking, turning, lifting, and carrying objects (Girdhar et al. 2001). The level of amputation determines the degree of impairment, in that physical limitations are greater with more proximal loss (Narang et al. 1984). A subject with transtibial amputation with a functional knee joint, wearing a prosthesis, can still actively extend the knee joint on the amputated side to assist with moving from a sitting to standing position, and has less energy expenditure when walking compared to more proximal amputation (Gonzales and Corcoran 1994). Persons with transtibial amputation can return to most functional activities, with limitations mainly related to lack of ankle mobility and loss of ankle and foot proprioception, which leads to difficulty climbing ladders or kneeling and squatting for example. Issues with the fit of the prosthetic socket can lead to skin breakdown and pain, particularly in more active users (Dudek et al. 2005), and can limit prolonged walking and the ability to perform high-impact activities. With a transfemoral amputation, loss of the knee joint leads to a greater increase in energy demand for walking (Gonzales and Corcoran 1994), and greater difficulties with standing up (Burger et al. 2005; Kuzelicki et al. 2005), walking, and climbing stairs. The individual loses the ability to use the amputated limb to provide knee power for sitting or squatting. A person with a hip disarticulation will almost always require gait aids and be unable to stand for prolonged periods of time, although he or she can return to independent-level surface ambulation (Nowroozi et al. 1983). Understanding these mobility restrictions for a given level of amputation assists with determining physical capability in the work environment.

The rehabilitation goals following lower limb amputation typically involve prosthetic replacement of the limb, but not all persons with amputation become functional prosthetic users (Pernot et al. 2000; Uiterwijk et al. 1997). The higher the level of the amputation, the lower the rate of success with prosthetic fitting, along with other factors that influence prosthetic outcome such as age, medical comorbidities, and pre-amputation level of function (Pernot et al. 1997).

Therefore, it is important to keep in mind that some individuals may wish to return to work without a prosthesis, in a sedentary role either using a wheelchair or using other ambulatory aids such as crutches. However, for most work-aged individuals with single-limb lower level of amputation (preservation of at least one knee joint), prosthetic replacement to restore ambulation should be the initial goal, followed by a return-to-work plan based on their functional recovery.

In addition to mobility limitations, amputation can also result in phantom or limb pain that interferes with concentration and performance in the workplace (Ide et al. 2002; Millstein et al. 1985; Whyte and Carroll 2002). Phantom pain also influences use of the prosthesis, which may further limit mobility. Concerns with body image related to loss of limb can impact psychosocial adjustment and social interaction in the workplace (Rybarczyk et al. 1995). It is noted for all levels of amputation that mental health disturbance and difficulties with psychosocial adjustment are frequently seen (Horgan and MacLachlan 2004; Gallagher and MacLachlan 2001), and these comorbidities can have significant additional impacts on rehabilitation and return to work. Rates of depressive disorder among persons with limb loss range from 21 to 35 % compared to 10–15 % in the general population (Williams et al. 2004). Delayed and chronic post-traumatic stress disorder (PTSD) requiring psychiatric treatment has been reported in up to 72 % of individuals following traumatic amputation (Copuroglu et al. 2010). In this study population, half of the study participants had a work-related traumatic amputation. Cavanagh et al. (2006) found that symptoms of post-traumatic stress were not common in amputation due to chronic disease, but were more prevalent following accidental trauma leading to amputation. Kratz et al. (2010) found that regardless of etiology (traumatic or non-traumatic amputation), there were similar outcomes in the first year, but an increase in posttraumatic symptoms over time, particularly in the traumatic group. Mental health-related impairment should be therefore routinely assessed along with functional mobility when determining a return-to-work plan, and followed over time for possible late emergence.

28.2.2 Return-to-Work Rates

Return-to-work rates are difficult to compare across studies due to varying definitions of successful employment, small sample sizes, different lengths of follow-up, and inconsistent detail on the type of work involved before and after amputation. The rates of reemployment after lower limb amputation range from 43 to 100 % (Ebrahimzadeh and Rajabi 2007; Pohjolainen et al. 1990; Schoppen et al. 2001a), with most studies finding a return-to-work rate around 66 % (Curley et al. 1982; Fisher et al. 2003; Schoppen et al. 2001a). Notable exceptions include the return-to-work rate following tumor reported at 100 % (Ferrapie et al. 2003) and the low return-to-work rate for those with bilateral lower limb amputations reported by Smith et al. (2005) at 16 % and Atesalp et al. (1999) at 31 %.

The time taken to return to work following amputation ranges from 9 months reported after transtibial amputation (Bruins et al. 2003) up to 2.3 years in the study by Schoppen et al. (2001a), independent of the amputation level. Most studies find the time to return to work following lower limb amputation to be around 1 year (Hebert and Ashworth 2006; Livingston et al. 1994; Rotter et al. 2006). The most frequent reasons for longer time taken to return to work were stump problems and problems in wound healing (85 %), problems with job reintegration process (46 %), and mental problems (23 %) (Bruins et al. 2003).

The evidence regarding return to the same occupation after lower limb loss also ranges substantially, with varying reports from 22 to 67 % of research participants overall returning to the same job (Bruins et al. 2003; Fisher et al. 2003; Kegel et al. 1978; Millstein et al. 1985; Pedersen and Damholt 1994; Schoppen et al. 2001a). Very few individuals that had physically demanding jobs are able to return to full-time employment in the same job following amputation. Narang et al. (1984) studied an active population (mean age 25 years) and reported that only 12 % returned to the same job, although this finding may be due to 60 % of study participants being soldiers unable to return to active duty. Studies in the military population in the USA have traditionally shown very low rates of remaining on active duties with 97 % leaving the service (Kishbaugh et al. 1995). Other studies have reported that veterans, however, do have good rates of reemployment in the civilian sector, with 69–70 % of Vietnam War Veterans employed (Curley et al. 1982), including bilateral trans-femoral amputees (Dougherty 1999).

Overall, if study participants had a job with a very high physical workload, some were able to return to the workplace but change jobs, or change the workplace all together, with an overall 58 % successful return to work (Bruins et al. 2003; Fisher et al. 2003). Evidence is not fully consistent on the type of job change following return to work, but most studies indicate that if individuals return to a different occupation, the type of job they return to tends to be less physically demanding (Millstein et al. 1985; Pezzin et al. 2000; Schoppen et al. 2001a; Whyte and Carroll 2002), but requiring a higher level of education (Millstein et al. 1985; Pezzin et al. 2000; Schoppen et al. 2001a). However, in contrast to these findings, one well-designed survey study of a large population of working-age amputees showed that of those who returned to work, most changed occupational classification by moving down from skilled to semi- or unskilled occupations (Whyte and Carroll 2002). This issue may be related to the fact that the population was a group of persons with phantom limb pain as the inclusion criteria, and there was little use of occupational services; however, this information was not reported.

Study participants who changed their occupation were reported as being more successfully reintegrated (90 %) than those who did not change it (68 %) (Schoppen et al. 2001b). Individuals with transtibial level of amputation (Kegel et al. 1978) and a physically undemanding job (Bruins et al. 2003) were more successful at returning to the same occupation. For example, in one study pre- and post-amputation, prior to injury only 1 % had a sedentary job, but following amputation 16 % returned to sedentary work and only 21 % returned to their pre-amputation work (Millstein et al. 1985).

From 34 to 50 % of study participants have been reported as returning to part-time work following amputation rather than full-time work (Bruins et al. 2003; Jones et al. 1993; Livingston et al. 1994; Schoppen et al. 2001a). Further to this finding, it has been reported that after return to work, 25 % of amputees experience periods of unemployment lasting for more than 6 months since amputation (Millstein et al. 1985). In the first 2 years after amputation, 55 % of amputees stopped working and 78 % indicated that factors related to their amputation played a role in their decision (Schoppen et al. 2001a).

28.2.3 Factors Influencing Return to Work

As per the ICF (WHO 2001), factors influencing return to work can be related to the *health condition* (cause of the amputation) and its consequences, *personal factors* (such as age, gender, educational level), and *environmental factors* (such as rehabilitation, prosthetic fitting, and workplace policies).

28.2.3.1 Health Condition: Amputation and Its Consequences

Although it is known that higher amputation level affects overall functional mobility (Narang et al. 1984), studies have not consistently shown that higher amputation level reduces return-to-work rate. Livingston et al. (1994) found that no study participants returned to work after trans-femoral amputation, whereas 48 % were reemployed after transtibial amputation. Other smaller studies have also shown transtibial amputation to be more common than trans-femoral amputation in those working full time (Jones et al. 1993). The findings of Dougherty (1999) are unique in that he found that 70 % of veterans from the Vietnam War with bilateral trans-femoral amputation were employed outside the home. Other studies have not found level or cause of amputation to correlate with the score on the employment questionnaire (Fisher et al. 2003) nor have they been able to predict a difference in return to work between transtibial and trans-femoral levels in work-related amputation (Hebert and Ashworth 2006).

Reemployment rate is reported to be lower overall for work-related amputation (Livingston et al. 1994). For study participants with trauma as the cause of amputation, time delay from injury to amputation is generally reported to have a negative impact on disability level (Bondurant et al. 1988) and occupational rehabilitation and return to work (Rack and Hofmann 2003), although not all studies have found this to be true (Pedersen and Damholt 1994). Most of the studies on the effects of delayed amputation are confounded by being retrospective in nature, with small sample sizes and with significant relationships being found with age and severity of injury.

Phantom and stump pain are negatively associated with successful employment in both upper and lower limb amputation (Millstein et al. 1985; Whyte and Carroll 2002), although one study found no relation of pain severity to return to work but significant relation to decreased satisfaction with working life (Ide et al. 2002). The presence of PTSD has also been shown to reduce rates of return to work in those with road accidents (Matthews 2005).

28.2.3.2 Personal Factors

Age is a well-known predictor of outcome following amputation, and studies confirm that persons with amputation who are over 45 years of age have higher unemployment rates (48 %) compared to those under 45 years of age (22 % unemployment) (Millstein et al. 1985) and most that did not return to their job after amputation were older than 45 years (Pedersen and Damholt 1994). Study participants who were older at the time of amputation were also less satisfied with reintegration into work activities when they did return to work (Nissen and Newman 1992).

Pre-injury educational level also impacts reemployment rate, as those with lower levels of education had a lower rate of return to work, and more of them had to change their job (Livingston et al. 1994; MacKenzie et al. 2006). Higher education (college education compared to high school or less) resulted in significantly better return-to-work rates (Weed et al. 1997). Younger patients with amputation due to bone tumor (Nagarajan et al. 2003) and survivors of high-grade osteosarcoma (Yonemoto et al. 2007) were less likely to complete higher levels of education, which may also have an impact on employability.

Gender has been reported to have an impact on employment, with two authors reporting greater unemployment in women than in men following amputation (Millstein et al. 1985; Whyte and Carroll 2002). Schoppen et al. (2001a) found that fewer older men were employed but that age had no influence on the employment of women. Nonsmokers and people with higher self-efficacy have been reported to have a higher rate of return to work (MacKenzie et al. 2006).

28.2.3.3 Environmental Factors

The impact of rehabilitation services on return to work is difficult to surmise, as the type of intervention and criteria for inclusion in different programs are not always stated. Although most patients access some type of rehabilitation following amputation, vocational services are not always available with every rehabilitation program (Fisher et al. 2003) but have been shown to improve return to work (Millstein et al. 1985). Reported differences in return-to-work rates favoring outpatient over inpatient rehabilitation (Livingston et al. 1994) may reflect selection bias, as typically outpatients are already functioning in the community and this may factor in their ability to return to work, although some authors have advocated improved health and vocational outcome with inpatient rehabilitation (Pezzin et al. 2000). Successful prosthetic fitting has also shown a benefit for improving work return and retention (Dasgupta et al. 1997; Grossman et al. 2005; Millstein et al. 1985), and study participants who frequently use prostheses are more likely to be employed (Millstein et al. 1985).

Work environment and compensation factors also influence return to work. Higher gross annual income positively impacts return to work (Hebert and Ashworth 2006), as does higher job involvement (MacKenzie et al. 2006), good support from the employer (Boynton 1955; Bruins et al. 2003; Schoppen et al. 2001a), and a strong social support network (Boynton 1955; Livingston et al. 1994; Millstein et al. 1985). Negative influences on return to work include low pre-amputation income and lack of medical benefits related to work (Livingston et al. 1994). Study participants who did return to work tended to have a lower salary (Livingston et al. 1994; Millstein et al. 1985), fewer job promotion possibilities due to their physical condition (Bruins et al. 2003; Schoppen et al. 2001a), and less job security (Millstein et al. 1985).

Workplace adjustments and accommodations are frequently cited as being important to enable persons with amputation to return to work. These accommodations include allowing flexible work time and the ability to change workload, providing aids and assistive devices, and providing extra training (Schoppen et al. 2001a). Those who are able to do extra training at their workplace have a higher rate of return to work than those who require more extensive vocational training offsite (Millstein et al. 1985). Interestingly, most adjustments are initiated by the worker rather than by the rehabilitation team. This is consistent with the finding that self-motivation is likely the most important factor for successful job reintegration (Bruins et al. 2003). However, the employer and the implementing body are the most often reported obstacles to job reintegration (Bruins et al. 2003). Notably, 27 % of workers with amputation indicated that they were partially dependent on others in the workplace (Schoppen et al. 2001a) but most colleagues and supervisors gave them sufficient consideration.

Of those working after lower limb amputation, 70 % judged their work life as good and 30 % as unsatisfactory (Schoppen et al. 2002). Unsatisfied workers with amputation had more comorbidities and lower mobility level and wished more modifications of their workplace (Schoppen et al. 2002). The most important motives for returning to work were the value of their work as a form of spending the day and social contacts with colleagues and others (Bruins et al. 2003). Moreover, most people after amputation believe that the most important factor for return to work is their own attitude (Burger 2010; Burger and Marinček 2007; Millstein et al. 1985).

28.3 Upper Limb Amputation

28.3.1 Consequences from the ICF Perspective

Upper limb loss results in a substantially different set of limitations compared to lower limb amputation. After upper limb amputation, there are problems with grasping, lifting, pushing, pulling, writing, typing, and pounding (Girdhar et al. 2001). There are also potential problems with carrying objects and driving (Davidson 2002; Jones and Davidson 1995). Similar to lower limb amputation, the more proximal the limb loss the more function is lost, in both ability to control and place the hand in space and lifting ability. However, any loss or deformity of the hand leads to loss of fine motor dexterity, so upper limb amputation may be presumed to affect return to any job requiring fine motor manipulative skills (Burger et al. 2007; Sturup et al. 1988).

With longer transradial amputations, strength for grasping and carrying can be quite good with prosthetic replacement. However, with a shorter transradial limb or loss of the elbow joint in transhumeral levels of amputation, lifting and carrying restrictions are greater. Loss of the shoulder joint (shoulder disarticulation) leads to near-universal adaptation to one-handed function. For all levels of arm amputation, early prosthetic fitting in an attempt to restore grip and bimanual function should be the first goal, to maximize overall function, psychosocial adjustment, and acceptance of the prosthesis (Pezzin et al. 2004; Pinzur et al. 1994). However, the more proximal the level of amputation, the less likely the prosthesis will be integrated into all activities (Datta et al. 2004). Integrating the prosthesis into the workplace may therefore be a secondary goal or require further modifications/

adaptations with a second prosthesis designed for work activities, along with work modifications and adaptations.

Despite recent advances in upper limb technology, prosthetic replacement for the upper limb does not come close to replacing the fine dexterous sensate function of a normal hand. In general, prosthetic replacement for upper limb amputation has been compared to providing a “tool” for gripping, stabilizing, and carrying, particularly relevant for manual labor jobs; workers who use a cable-operated prosthesis tend to use it mostly for work duties (Millstein et al. 1986). The ability for prosthetic devices to provide higher levels of hand function is improving with recent multifunctional articulated myoelectric hands and newer advances in myoelectric control (Miguelez et al. 2009). The myoelectric devices have different considerations from mechanical devices due to the electromechanical aspects and require consideration of the environment in which the device will be used (Miguelez et al. 2009; Millstein et al. 1986). Therefore, assessment of the individual, their function, goals, and workplace are all essential factors in determining the potential to return to a given occupation.

An increasing area of recognition is that of the impact of partial hand amputation (Burger et al. 2007). Finger amputation is traditionally considered a “minor” amputation; yet as multiple digits are lost and amputation extends into the realm of partial hand loss, the impact of loss of dexterity becomes more relevant in the return-to-work realm. Partial hand and digit amputation has the highest incidence of occurrence of all upper limb amputation (Dillingham et al. 2002). Prosthetic replacement at this level must be individualized, and it is often difficult to replace grasp-and-pinch function compared to providing full prosthetic hand replacement as with more proximal amputation (Michael 1992). Therefore, rehabilitation to restore maximal function to the remaining hand should be a major part of the return-to-work approach, with assistive devices as a secondary consideration customized to the work environment and specific tasks.

28.3.2 Return-to-Work Rates

The return-to-work rate following upper limb amputation is reported between 51 % (Fernandez et al. 2000) and 100 %, although there are similar issues in the literature as in the lower limb population with respect to inconsistencies among studies and varying definitions of employment (Millstein et al. 1985) that limit comparison or explanation of varying rates. A recent study looking at participation restrictions following major limb amputation showed that employment and job seeking is the second most common area of participation restriction overall, but of significantly proportionally higher concern in the upper limb population (91.7 %) compared to the lower limb population (53.5 %) (Gallagher et al. 2011).

In studies of patients with upper limb amputation seen through a rehabilitation center, the rate of return to work varies from 53 % (Kejlaa 1992) to 85 % (Jones and Davidson 1995; Schoppen et al. 2002). Overall employment rates for persons with upper limb amputation have been reported as being substantially lower than the general population (Kejlaa 1992; Schoppen et al. 2002). Reemployment rate after finger or partial hand amputation is in the same range as that of more proximal limb amputation, from 64 % (Sagiv et al. 2002) to 72.2 % (Burger et al. 2007). The categorization of partial hand amputation as “minor” warrants further consideration, given that the impact on reemployment is similar to more proximal levels of amputation.

Following major upper limb amputation, between 20 and 100 % of study participants are reported as having to change the type of employment (Fernandez et al. 2000; Gaine et al. 1997; Hacking et al. 1997; Jones and Davidson 1995; Livingston et al. 1994; Wright et al. 1995). Most authors indicate that the need to change jobs after return to work is high; Datta et al. (2004) suggested that 67 % of the 73 % of their upper limb amputees who returned to work had to change their job; other reports have indicated only 5 % of their population retaining the same job, but 59 % returned to the same company in a different post (Fernandez et al. 2000).

It is reported to take between 5 days and 24 months to return to work following upper limb amputation (Chow and Ng 1993; Livingston et al. 1994; Reed 2004), depending on the amputation level and type of occupation. However, even after finger amputation it has been reported as taking on average 4 months to return to work (Chow and Ng 1993). Finger amputations that are work related have been reported as taking longer to return to work than amputations due to non-work-related accidents (Sagiv et al. 2002).

28.3.3 Factors Influencing Return to Work

28.3.3.1 Health Condition: Amputation and Its Consequences

Considering the level of amputation, losing fine motor dexterity with loss of three fingers or more most often results in inability to keep the same job (Burger et al. 2007). There is overlap in the rates of unemployment for various levels of upper limb amputation, but in general rates of unemployment are highest in those with transhumeral amputation, ranging from 22 % (Millstein et al. 1985) to 67 % (Fernandez et al. 2000; Millstein et al. 1985; Sturup et al. 1988), whereas transradial amputees have reported unemployment rates of only 10 % (Millstein et al. 1985; Sturup et al. 1988) to 40 % (Wright et al. 1995). Partial hand amputation has been reported to have an unemployment rate of 18 % (Millstein et al. 1985). Certainly, in most studies, retention of the elbow joint versus loss at the transhumeral level improves return to gainful employment (Fernandez et al. 2000). Multiple limb amputations also have a detrimental effect on return to work (Millstein et al. 1985).

Interestingly, lateral dominance did not influence return to employment (Burger et al. 2007; Fernandez et al. 2000; Millstein et al. 1985) and has no influence on type of work after the amputation (Burger et al. 2007). Stump pain, however, is a factor in unemployment (Wright et al. 1995). Following amputation, time to prosthetic fitting, if longer than 12 weeks, has shown to be negatively related to return to work (Gaine et al. 1997). Prosthetic use shows positive correlation with employment (Burger et al. 2007; Millstein et al. 1985; Schoppen et al. 2002), but some studies also indicate that non-prosthetic users are able to be employed (Sturup et al. 1988). The differences are likely related to the type of work, and type of prosthesis used. For example, unskilled workers with trauma-related amputation are likely to use their body-powered prosthesis (Sturup et al. 1988) whereas those with sedentary or supervisory occupations tend to use myoelectric (Silcox et al. 1993) or silicone finger prostheses (Burger et al. 2007; Hopper et al. 2000). Over 80 % of study participants with myoelectric prostheses use them for work (Pylatiuk et al. 2007). With advances in prosthetic technology and increased durability of myoelectric components in recent years, usage patterns may change.

Psychosocial adjustment has been shown to be an important factor in social integration following amputation (Horgan and MacLachlan 2004). Given the visibility of hand loss and impact on interaction with the surrounding environment, following upper limb amputation there may be additional barriers to return to work if the individual experiences a loss of body image and/or anxiety regarding returning to community activities, including the workplace. A depressive reaction is reported as being common immediately after amputation followed by a relatively high level of depression and anxiety for up to 2 years (Horgan and MacLachlan 2004). Depression has also been reported as the main factor that delays return to work for farmers after amputation (Reed 2004). Symptoms of post-traumatic stress are more common following traumatic upper limb amputation versus lower limb amputation (Cheung et al. 2003), and in one study of traumatic hand injury the occurrence of PTSD was independently associated with difficulty in return to work (Opsteegh et al. 2009). Clearly, these issues have to be individually addressed when considering a return-to-work plan, and should be given special consideration in the upper limb population with traumatic amputation. For a review of a rehabilitation counselor approach to addressing the psychological factors associated with traumatic amputation, the reader is referred to the work of Alvaro (2004).

28.3.3.2 Personal Factors

Age plays a role in predicting return to work after upper limb amputation in a similar fashion to lower limb amputation, with older age at the time of amputation and older age in general when living with amputation being negative predictors of return to work (Burger et al. 2007; Millstein et al. 1985; Wright et al. 1995). Gender has an inconsistent effect, with two studies suggesting higher rates of unemployment in women with upper limb amputation than men (Millstein et al. 1985; Wright et al. 1995), whereas other authors have found retirement and unemployment to be more common in males (Fernandez et al. 2000). For partial hand amputation, more women than men have been found to return to the same job in one study (Burger et al. 2007). Individuals with lower levels of education also tend to change jobs after amputation (Fernandez et al. 2000; Gaine et al. 1997; Hacking et al. 1997; Jones and Davidson 1995; Livingston et al. 1994; Wright et al. 1995).

28.3.3.3 Environmental Factors

Return to work depends largely on the type of job the person was working at prior to the amputation. Most injured workers and study participants who have to change their job after amputation are involved in unskilled manual labor prior to amputation and change to less physically demanding jobs with higher intellectual or educational requirement post-amputation (Burger et al. 2007; Jones and Davidson 1995; Millstein et al. 1985; Sagiv et al. 2002; Schoppen et al. 2002). An exception to this would be the study of Pinzur et al. (1994) which found that most of the laborers and machine operators injured at work were able to return to their former job including active prehension activities; and only three participants changed to less physically demanding jobs. However, this was a small sample, and their protocol included early-fitting post-amputation, which may have positively affected the ability to use the prosthesis and integrate usage into bimanual activities.

In the farming industry, one study reported a 100 % reemployment rate (Reed 2004), mainly involving injured workers who were self-employed and returned to work within 6 months of amputation, whereas in a separate study the lowest percentage of return to work was found in the agricultural sector, at 14 % (Fernandez et al. 2000). The variables explaining this wide variance may relate to socioeconomic factors such as unemployment rates, as the latter study found significant differences in return to work based on the sector unemployment rate at the time of amputation, and highest reemployment (77 %) in the building industry, which was in high demand for employment at the time (Fernandez et al. 2000).

For partial hand amputation, up to 47 % of study participants are reported to have to change their work (Burger et al. 2007; Chow and Ng 1993; Hung et al. 1999; Lifchez et al. 2005; Sagiv et al. 2002). If only one fingertip is involved (not thumb), all subject participants have been reported to return to the same job (Hattori et al. 2006), unless they are musicians playing strings, keyboard, or woodwinds (Dumontier 2003).

There are contradictory findings on work and policy factors affecting return to work after upper limb amputation, for example size and structure of the company (Fernandez et al. 2000). It has been shown that very few people who sustain work-related arm amputation return to the same work (Livingston et al. 1994). It is possible to modify workstations and redesign tasks to make jobs easier after upper limb amputation (Girdhar et al. 2001), but individual competence and initiative may be an equally important factor in determining ability to carry out other jobs in the workplace (Fernandez et al. 2000).

28.4 Conclusions

Amputation results in a permanent change in body structure, which may or may not be partially compensated with prosthetic rehabilitation. The goal after amputation is to reduce activity limitations and increase participation, of which return to work is an integral component.

Following amputation, there are significant challenges in return to work and return to same occupation.

In lower limb amputation, the more proximal the loss, the greater the mobility restriction; however success in return to work is strongly affected by age and pre-amputation function rather than level of amputation. In general, two-thirds of people return to work after lower limb amputation, after about 1 year, to less physically demanding occupations. The level of amputation does not affect return to work, but if a person is successfully fit with a prosthesis, this procedure has a positive impact on return to work. Younger age and greater level of education also positively affect return-to-work outcome, as does positive support from the employer. Mental health issues such as depression, and post-traumatic stress in the case of traumatic amputation, should be evaluated and managed in parallel to the physical issues related to amputation. The prolonged length of time commonly reported to return to work should have important implications on policy development. The suggestion that there is better job reintegration and satisfaction in the workplace with change in job also implies an important role for vocational retraining and vocational rehabilitation in the first year after amputation, to facilitate replacement in the workforce.

For upper limb amputation, there are surprisingly similar types of barriers to return to work regardless of the level of amputation (from partial hand to shoulder-level amputation), although retention of the elbow joint is in general more positive for return to work. Type of employment is the major consideration in success of return to work. There may be even more psychological adjustment issues for upper limb amputation due to the visibility of the loss, which can affect reintegration to the workplace. Accommodation within the workplace, along with positive support from the employer and workplace, is an-important factor in determining successful work reintegration.

Firm conclusions on return-to-work guidelines are limited by the literature to inferring the typical outcome based on predictive factors and retrospective surveys. Both lower and upper limb amputations make return to work difficult. Individual assessment of physical capability, mental health and motivation, and employment environment are paramount to developing a successful return-to-work plan. Physical medicine and rehabilitation specialists and an interdisciplinary rehabilitation team should be involved with determining capacity to return to work, and there should be consideration of including vocational rehabilitation planning into standard rehabilitation programs. In general, persons with amputation are noted to be more successful if they return to less physically demanding jobs, and are offered retraining and educational opportunities and adaptation to the workplace to accommodate their functional change to allow them to return to productive employment.

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29

Issues and Interventions for Workforce Participation After Spinal Cord Injury

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29.1 Introduction

There are 250,000 people in the United States living with a spinal cord injury (SCI). Each year there are approximately 11,000 people who sustain new spinal cord injuries, in many cases during young adulthood. From a developmental perspective, these injuries usually occur during what is typically referred to as the productive years of one's life; that is, the time when a person is either starting out or fully engaged in work and career. Among the many life processes that are disrupted by spinal cord injury, employment is usually halted or may seem completely out of reach. The injury represents a catastrophically disruptive event. Despite the fact that many individuals with SCI want to work and consider themselves able to do so, most do not work following such injuries. Although a substantial amount of literature is available on rates and predictors of employment following SCI, there is little information or data on effective vocational rehabilitation interventions to improve employment outcomes following SCI to guide consumers or professionals. This chapter seeks to address this gap by discussing the medical issues and considerations surrounding returning to work after an SCI, reviewing the current state of knowledge regarding known Vocational Rehabilitation (VR) interventions, and offering practical suggestions for moving forward in the clinical arena for healthcare providers and advocates.

29.1.1 Chapter Purpose and Objectives

There are recent chapters that provide comprehensive treatment of the broad area of vocational issues and SCI (Johnson 2010; Meade et al. 2011). The reader is referred to these well-written chapters for issues concerning the important areas of critical legislation relevant to return to work for persons with disabilities, including Social Security

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and veterans benefits systems, workers' compensation and other incentives and disincentives to work, as well as a helpful overview of general models of vocational rehabilitation programs that are available for all persons with disabilities, including those with SCI.

The present chapter focuses on recommended or proven interventions and practices for improving vocational outcomes following spinal cord injury. Toward that end, this chapter has the following objectives:

- *Objective 1*: Provide an overview of medical aspects of SCI and the associated complications that impact employment. Discuss strategies for optimizing medical care and prevention to facilitate return to employment.
- *Objective 2*: Discuss the current research support for vocational rehabilitation in SCI, including clinical implications from the literature, case examples, and results from a recently completed multicenter trial of a supported employment model of return to work.
- *Objective 3*: Discuss real world practice issues for rehabilitation professionals, teams, and administrators to consider in assisting persons with SCI find and keep employment.

The ultimate goal of the chapter is to provide the reader with a fuller appreciation of the effects of SCI on employment and interventions that can be initiated in practice to facilitate participation in the workplace after injury.

29.2 Medical Aspects of Spinal Cord Injury

The spinal cord connects the brain and brain stem to the nerves that lead to muscles, skin (including sensory function), the lower colon, bladder, and blood vessels. Injury to, or diseases of, the spinal cord may cause weakness, loss of feeling, inability to walk and perform other activities, and alteration in the normal function of everything below the injury.

"Paraplegia" is a term that refers to any involvement of the lower part of the spinal cord (below the neck), which causes paralysis of the lower part of the body, including the bowel and bladder. This paralysis may be partial. "Tetraplegia," a term that is preferred to the older term "quadriplegia," is used when the arms are also involved due to disease or damage in the cervical (neck) portion of the spinal cord. This scenario includes any arm involvement related to spinal cord damage, complete or incomplete. Which muscles have paralysis depends upon how high the injury has occurred: the higher the injury is in the neck, the more muscles and skin will have sensorimotor impairments. Some people mistakenly think that a person with tetraplegia has no arm function at all, but this is not usually the case. A person may refer to him or her as a "paraplegic" or "quadriplegic"; it is more appropriate to refer to that person as "a person with paraplegia (or tetraplegia)." In other words, paraplegia/tetraplegia is a condition they have but is not who they are—the injury does not define them.

SCI results in a number of complications, which are currently incurable and require lifelong management and preventive interventions to avoid further complications (National Spinal Cord Injury Statistical Centre 2010).

29.2.1 Spinal Cord Injury Systems of Care in the United States

There are two large organized systems of SCI care in the United States. One of these is the SCI Model Systems Centers, funded by the National Institute for Disability and Rehabilitation Research, which is under the Department of Education. Currently, there are 14 centers funded (2006–2011) under this program. The Model Systems Centers serve people with SCI who are referred in through affiliated trauma centers or outside facilities. Most people with SCI followed in this system are civilians, but persons are served without regard to veteran status.

The other system is the Veterans Health Administration Spinal Cord Injury System of Care, which currently includes 25 SCI Centers, and provides specialty care to approximately

17,000 US Military Veterans with SCI, making it the largest single provider of Spinal Cord Injury and Dysfunction Medical Care in the world (National Spinal Cord Injury Statistical Centre 2010).

Both systems of care maintain databases of people with spinal cord injury and sometimes other diseases that affect the spinal cord. These systems of care provide broad-based medical and rehabilitative care that seeks to restore functional potential in all areas of life, including physical, emotional, social, recreational, spiritual, and vocational.

29.2.2 Epidemiology of Spinal Cord Injury

The general population of the United States is living longer, resulting in an increased average age. This change has resulted in an increased average age of the population of people with SCI (DeVivo 2010). The age at which people incur SCI has also increased, which may be due to the increased age of the population in general coupled with an increase in osteoarthritis ("old age arthritis") and cervical stenosis (narrowing of the canal in the neck through which the spinal cord passes) as an etiology for SCI. There have been discussions about increasing the retirement age for Social Security benefits. These facts make it clear that it is important to retain employment as a goal later into life than previously thought.

Due to advances in medical care, such as improvements in management of neurogenic bladder, more persons with SCI survive the acute and subacute periods (i.e., the first 2 years following SCI) (Shavelle et al. 2015; Strauss et al. 2006). Hence, the focus among researchers, consumers, and clinicians has shifted from merely surviving an SCI to managing SCI effectively and providing services and support that maximize activity and participation in all areas of life over the lifespan. In other words, the goal is to continue to live a full, rich, and meaningful life after SCI, or to thrive. This goal includes facilitating and sustaining community integration with a viable working life.

SCI denotes damage occurring to the spinal cord, usually caused by trauma such as motor vehicle accidents, falls, or violence. However, other causes including narrowing of the spinal canal due to arthritis (with or without additional trauma) and infections localized to the spinal cord are often included in SCI registries. Infections or tumors externally compressing the spinal cord or unknown causes may result in damage. The term myelopathy literally means "disease of the spinal cord." Other diseases that can involve the spinal cord, such as multiple sclerosis, amyotrophic lateral sclerosis (Lou Gehrig's disease), and a variety of other progressive or degenerative causes of spinal cord damage, are often not included in these registries.

The most common cause remains vehicular, followed by falls and violence. Violence is a more common cause of SCI in minorities. SCI occurs predominantly in men (roughly 80 % of injuries), and rates are higher for African Americans than for whites. Among minorities, violence is the leading cause of SCI (DeVivo 2010). These demographics are particularly relevant to the extent that African Americans are disadvantaged in the workplace.

Some change in demographics has occurred in the last two decades, with an increase in the average age at the time of injury. The mean age at the time of injury has increased in each successive time period studied, from about 29 during the 1973–1979 time period to about 36 after 2000 (DeVivo 2010). This is likely due to the increase in injuries occurring in older persons with arthritis and falls (DeVivo 2010) and correlates with the increased average age of the US population. Historically, SCI has been something that occurs in persons in the 18–35 year age range, which are considered the prime working years. The economic consequences of SCI remain very large. Individual healthcare costs are often in the millions of dollars.

29.2.3 Secondary Complications of Spinal Cord Injury and Effects on Daily Living Including Work

Prior to WWII, most people did not survive spinal cord injury for prolonged periods. Inability to empty the bladder normally, which led to severe urinary tract infections and kidney failure, was the most common cause of death. With advances in medical care for this population, people who survive the first year may now have a near-normal life expectancy. People with SCI are left with a number of chronic conditions, which must be properly managed to avoid potential morbidity and mortality. Likewise, complications related to these conditions, if they occur, can have a dramatic effect on the ability of the person with SCI to participate in the workplace. On the brighter side, if these health conditions can be successfully managed, nearly all persons with SCI can engage in meaningful work.

What follows is a brief discussion of the more common and important medical complications of spinal cord injury, with specific reference to their known or likely impact on employment. Other issues exist which are beyond the scope of this chapter. The reader is directed to more detailed resources (Kirshblum 2012; Lin et al. 2010) for further information.

29.2.3.1 Pressure Ulcers

Pressure ulcers are a common medical complication and cause of re-hospitalization after the acute period following SCI (Cardenas et al. 2004). Pressure ulcers occur when prolonged pressure, usually under a bony prominence such as the tailbone (coccyx) or sitting bones (ischia), leads to loss of blood flow and tissue death. Because of loss of sensation and movement, persons with SCI often do not weight shift or "fidget" normally to relieve pressure. Up to a third of people with SCI will incur a pressure ulcer. A stage three or four ulcer–that is, an ulcer that extends through the skin into deep tissue, sometimes even to the bone–will occur in 15 % during their lifetime (Consortium for Spinal Cord Medicine, 2001). Further, multiple and recurrent ulcers plague some persons with SCI throughout their life. Infection of the bone, known as osteomyelitis, may occur and require prolonged treatment. Conservative wound healing and surgical wound healing both often require weeks or months to complete.

SCI healthcare providers direct much effort toward the difficult tasks of preventing and healing pressure ulcers (Black et al. 2011). Receipt and maintenance of the appropriate cushion and mattress and an appropriately fitted wheelchair are critical to preventing a pressure ulcer. Clients are taught pressure-relieving maneuvers. Depending on their ability, they may push themselves up using the wheelchair armrest, lean forward or to the side, or require a specialized power wheelchair with a tilt or recline mode to offload bony prominences. Persons with memory problems may be given alarm timers to assist with scheduled pressure relief maneuvers. However, no clinical evidence exists to determine the proper interval. Also, needs might vary considerably depending on a person's age, body habitus, and other factors. The standard adopted is about every 15 min.

All members of the interdisciplinary SCI rehabilitation team can contribute to efforts aimed at preventing pressure ulcers. SCI patients are taught skin inspection techniques and how to minimize moisture from bowel or bladder incontinence. They are instructed how to minimize friction or bruising during transfers. They should be trained how to maintain equipment, including cushions, in good condition, and when to replace these items. Some persons may need to get out of their wheelchair during the daytime to check their skin integrity or relieve pressure on sitting areas.

Persons with SCI also frequently get wounds on their lower extremities from abrasions, footwear, mattresses, or burns. They may have chronic swelling in their lower legs and tend to heal slowly. Special compression stockings may be needed to manage swelling. Although foot wounds may start out small, if these wounds become severe enough and involve bone, they may not heal and can require partial or complete leg amputations.

Current technology and other prevention strategies have proven inadequate to significantly reduce the incidence of pressure ulcers. The healing time for these ulcers averages many weeks but can be years. Some persons never heal their ulcer and are left with chronic open and draining wounds. The cost of pressure ulcers to the healthcare system is enormous (Black et al. 2011).

Data are not available on the magnitude of work time lost due to pressure ulcers in this population. However, it is undoubtedly large. Persons with spinal cord injury who are admitted to the hospital with a pressure ulcer may have to take a long period of leave from work or lose their job completely. Depending upon the ulcer location, a person may not be able to sit in a wheelchair for extended periods or at all. Multiple authors have reported that the psychosocial impact of pressure ulcers on persons with SCI and their families is significant (Anderson and Andberg 1979; Consortium for Spinal Cord Medicine 2014; Krause 1998).

Many studies have evaluated associations with pressure ulcers after SCI. Some studies report an increased risk, others a decreased risk, and others no association between employment and the occurrence of pressure ulcers. There is evidence that persons with SCI who are employed have fewer pressure ulcers, and better overall health, than those who are not (Consortium for Spinal Cord Medicine 2014). It is known that people with a prior history of ulcers are more likely to get another one, but it is not known how the prospect of future employment might affect a person's attention to their skin care and protective equipment (wheelchair cushions, mattresses). Are people who are working more likely to check their skin to avoid missing time away from their job? Or are those who maintain employment able to do so because they already have better health status? It is not known whether persons who are employed are generally more active or not, whether they also exercise more or eat a healthier diet. Persons with SCI and a history of pressure ulcers may fear recurrence if they have to sit for prolonged periods at work and therefore may not pursue employment. Those persons with existing pressure ulcers (and their providers) may not know how long the person can sit without worsening their ulcer.

At the worksite, persons with SCI need to continue to perform certain recommended preventive activities. As described above, these would include frequent weight shifts or pressure relief maneuvers that may require breaks from their duties. If the option to stand up or use a standing wheelchair is available, this may be helpful. Whether certain types of jobs (e.g., sitting in front of a computer all day versus moving around at work) have an impact on pressure ulcer occurrence is not known. Clearly, given the significance of this problem, further research is needed. Vocational providers should work closely with occupational and/or physical therapists to ensure that the person's currently prescribed seating and wheelchair system will be optimal for their work setting. Changes in activity patterns or schedules that a new work environment may produce should be anticipated with respect to the potential impact on the person's skin.

29.2.3.2 Autonomic Dysreflexia

Autonomic dysreflexia (AD) deserves special mention, as it is essentially unique to persons with SCI. AD is a potentially life-threatening condition that often presents with a pounding headache, anxiety, flushing, perspiration, and possibly nasal congestion or goose bumps. It is caused by an exaggerated autonomic ("adrenaline-like") response to a stimulus that a person without impaired sensation would feel as discomfort (and likely therefore take action to eliminate). The most common causes are distension of the bladder or bowel. Severe complications from AD can occur, including stroke, heart attack, and altered heart rhythms. Persons with higher injuries, usually about T6 (mid-chest) and above, represent the group at risk.

Individuals with SCI and their caregivers should be taught about AD and its treatment. Specialized wallet cards for this purpose are available for individuals with SCI so that they can show them to medical providers and others. AD can occur anywhere, including the workplace. Coworkers and workplace medical providers should be educated about the condition and how to assist the person during an episode. There might be a tendency to want to have the person "lie down and rest," but the person with SCI needs to be upright to promote lower blood pressure. Coworkers can help the person get to a bathroom, or employee health clinic if available, so the person can ensure that the bladder is empty or drainage tubing is not blocked, that the rectum is not distended with stool, or that hemorrhoids are not irritated from sitting. Tight clothing needs to be loosened or removed. Arrangements should be in place so that the person with SCI can have their blood pressure checked while at work. The person with SCI should have medication (such as nitroglycerin paste) available and a plan for efficient transport to the nearest medical facility if symptoms are persistent and severe.

29.2.3.3 Neurogenic Bladder

Loss of voluntary bladder control is a common impairment in SCI, requiring alternative strategies for storing and emptying urine, particularly the use of urinary catheters. The goals of bladder management after SCI are to preserve kidney and bladder function, prevent urinary tract infections (UTIs), and achieve social continence (stay dry). Most persons with spinal cord injury require some sort of urinary catheter (drainage tube). This can remain in place all the time ("indwelling") in the urethra or abdomen or can be inserted intermittently at least every few hours. The latter is known as intermittent catheterization. It is referred to as "self catheterization" if the person can perform this independently. Some men with SCI use an external catheter, which rolls like a condom over the glans and shaft of the penis.

Barriers to keeping dry include leakage between catheterizations, leakage around indwelling catheters, and failure of external catheters to remain properly in place. In one study, worsening urinary incontinence (leakage) was a predictor of impending unemployment in people with multiple sclerosis (Wollin and Spencer 2007).

UTIs are the most frequent infection and illness in persons with chronic SCI and a leading cause of re-hospitalization (Cardenas et al. 2004). Symptoms of UTIs may include fevers, shaking chills, "flu-like" symptoms such as aching joints and muscles, nausea, and emesis. However, symptoms may be more subtle, including changes in bowel habits, worsened pain or spasticity, fatigue, or just "feeling lousy" (Burns 1998). Persons with SCI may or may not notice changes in the color, clarity, or odor of their urine. Early recognition of symptoms and prompt treatment of infection are important to prevent complications. These infections may result in need for provider visits or hospitalizations, leading to lost time or absences from work. Additional data regarding the magnitude of this problem are needed to better understand the influence of UTIs on work.

Individuals with SCI often need medication to relax their bladder and prevent bladder spasms, which helps them store urine (to stay dry) and maintain low pressure in the bladder. Side effects of medications can occur, such as dry mouth, blurred vision, dizziness, constipation, thinking problems, and sedation. If the person with SCI urinates on their own, their provider should ask how often they have the urge to urinate, how frequently they need to use the restroom for this, and how often they leak or dribble urine. The same questions apply to persons who intermittently catheterize their bladder. Monitoring of fluid intake and fluid restriction, generally two liters or less per day, may be additionally indicated. Catheterization regimens should also be evaluated and altered if needed for a vocational setting. Intermittent catheterization every 4–6 h, utilizing clean techniques or sterile kits, is the recommended management for persons who are unable to empty their bladder adequately (Linsenmeyer 2002; Maynard and Glass 1987; Weld and Dmochowski 2000). To be able to carry this out, however, adequate hand function and mobility or a reliable caregiver must be present. Complications can occur due to urinary catheters. Penile trauma (skin abrasions, penile swelling, or even tissue death) can be caused by external catheters and may be severe enough to necessitate amputation. Checking the skin on the penis, changing of external catheters at regular intervals, and sometimes trimming of the external catheter with scissors at the base of the penis can help prevent these problems. Traction injury, also known as traumatic hypospadias, is splitting of the underside of the penis that can occur due to prolonged use of indwelling catheters. Securing the catheter to the thigh or abdomen with tape is recommended to minimize risk of trauma to the skin. Specialized securement devices such as the StatLock Foley® (Darouiche et al. 2006) also serve this purpose. Urethral trauma and bleeding, difficulty with insertion, pain (if the person has sensation), or autonomic dysreflexia (AD) can occur during the process of catheterization.

As described above, AD is a potentially life-threatening condition that can appear suddenly in individuals living with SCI. Bladder problems are the most common cause of AD, responsible for up to 80 % of episodes (Kewalramani 1980; Kursh et al. 1977; Lindan et al. 1980). Bladder overdistension and elevated bladder pressure may occur in persons on intermittent catheterization, leading to AD episodes. Catheter blockage from debris, catheter encrustation or bladder calculi (stones), or kinking of catheters or tubing can cause an episode of AD.

Persons with SCI and a neurogenic bladder are at increased risk for complications such as bladder and renal stones and urinary tract cancers. Symptoms of these complications include blood in the urine, UTIs, back pain, abdominal pain, or increased spasticity.

The role of caregivers is a necessary factor to consider for bowel and bladder care. If assistance is needed for bowel or bladder emptying or management of devices, caregivers may need access to the workplace. Negotiation with employers is indicated. Women with SCI who perform intermittent catheterization may need to get out of their wheelchair to do this. Women with SCI require a management strategy that fits their work schedule and vice versa. Individuals with SCI may require assistance with emptying urinary collection bags or need personal attendants to perform intermittent bladder catheterization.

Assistive devices such as electric leg bag emptiers, leg spreaders, or splints to create grip can replace some caregiver functions. A plan for bowel and bladder management that includes the workplace should be made. It is necessary to assess how often bladder and bowel emptying needs to occur and what facilities are available. Worksites should be evaluated for accessible restrooms and locker or shower facilities. Time requirements for bowel and bladder management, including medication administration schedules, should be considered in scheduling work hours and break times. Contingency plans should be made if bowel or bladder problems occur in the workplace.

29.2.3.4 Neurogenic Bowel

Bowel management may be a less apparent, though no less significant challenge for people with SCI as compared to mobility impairments (Stiens et al. 1997). The goal of bowel management after SCI is threefold: (1) scheduling a bowel care routine in order to maintain social continence (avoidance of bowel accidents), (2) obtaining proper stool consistency, and (3) preventing bowel-related medical complications. Bowel management is an area of great challenge, if not the greatest challenge, for persons living with SCI (Boss et al. 1995). Bowel problems have been reported to interfere with life activities in roughly half of persons with SCI (Consortium for Spinal Cord Medicine 1998a). Medical complications related to the gastrointestinal system in persons with SCI include hemorrhoids, bleeding, bowel impactions and obstruction. Hemorrhoids may cause bleeding; sitting on hemorrhoids may cause AD (Stone et al. 1990) and therefore may possibly limit the time a person can sit in a wheelchair.

As part of a regular bowel care routine, persons with SCI typically take oral medications to avoid having stool that is either excessively loose or hard. Rectal medications, such as suppositories, and techniques, such as digital rectal stimulation, are used to initiate timed bowel emptying. Scheduling bowel care is very important because a bowel care program can require 2 h or more. Work schedules should be considered when deciding between a morning versus an evening bowel program. For those working during the day, evening bowel care may be preferred. In the evening, however, outside caregivers might not be available to assist; for example, home health agencies will not assist with bowel care in the evening. Thus, for some, work schedule adjustment may be needed to accommodate proper bowel care.

There are two general types of bowel dysfunction after SCI: upper motor neuron ("spastic") or lower motor neuron ("flaccid"). For bowel care, persons with spastic type injuries can take advantage of gut reflexes and use digital rectal stimulation or stimulant suppositories to empty much of the colon, but these techniques cannot be used by persons with flaccid bowel dysfunction. Again, the healthcare team provides vital input while planning an individualized bowel care program that fits successfully with a work schedule.

Colostomy is considered a procedure of last resort but can be an effective option for those with chronic bowel management problems such as incontinence or prolonged time for bowel care. It is also performed for persons with SCI who experience frequent skin breakdown on areas of the body where the wound can be easily contaminated by stool. Colostomy bags require periodic emptying, so persons with limited hand function may require assistance with this task at home or at work. Although esthetic concerns may lessen the desire for a colostomy, higher satisfaction with, and reduced time for, bowel care has been reported after colostomy (Luther et al. 2005).

If a person with SCI has a poorly controlled neurogenic bowel resulting in unplanned evacuations ("accidents"), this will almost undoubtedly have social implications that can undermine vocational efforts (Stiens and King 2007). Certainly, some individuals are reluctant to pursue employment because of problems with bowel control. Bowel incontinence, and an ongoing fear of this problem, may cause individuals with SCI to become reluctant to leave home for extended periods. Despite the severity of this problem, there are few studies and a need for more data to quantify the magnitude of this challenge. It is quite possible that people underreport this sensitive issue. In one survey, 40 % of veterans with SCI reported dissatisfaction with their bowel management (Luther et al. 2005). Thus, concerns about adequate bowel control could present an even more extensive challenge than current data suggests.

29.2.3.5 Upper Extremity Impairment

As mentioned above, the level of injury determines which muscles in the upper extremity (UE) have deficits. Individuals with tetraplegia have weakness and sensory loss that may be mild or severe in some or all of the muscles of their arms. Individuals with paraplegia have normal arm function unless other problems, such as brachial plexus injuries, peripheral nerve problems, or other joint or tendon problems, are present. For example, persons with SCI commonly develop shoulder pain and dysfunction, most often from chronic or repeated rotator cuff tendon irritation. Another common problem in persons with SCI is carpal tunnel syndrome, related to entrapment of a nerve in the wrist. This condition causes pain and numbness in the fingers and can cause them to drop things.

Problems that can occur with tetraplegia include weakness, loss of sensation, loss of gross or fine motor coordination and dexterity, impaired position sense, and increased stiffness or tone. It has been reported that people with tetraplegia or more severe injuries are less likely to regain employment (Yasuda et al. 2002).

Specialized braces and splints can help compensate for some impairments. For example, individuals with no grip can use wrist function to cause a finger pinch with a "tenodesis" splint. In some cases, muscles can be activated electrically to perform functions through functional electrical stimulation (FES). Job modifications to substitute for upper extremity dysfunction are important. Performing an ergonomic evaluation of the work site can be useful to plan for needed accommodations. Individuals with UE dysfunction have benefited greatly from assistive technology. Special interfaces, including voice controls, to activate computers or other devices in the home are frequently used. Environmental control units (ECUs) can allow increased function in the home and workplace. In the modern workplace, UE dysfunction is no longer an insurmountable obstacle, due to technological advances.

29.2.3.6 Gait (Walking) Impairment

Some individuals with SCI who have incomplete and/or very low injuries retain the ability to ambulate to varying degrees. Even persons with SCI who have normal or near-normal leg strength generally have impaired proprioception (position sense), and therefore impaired standing and walking balance. Such deficits may be subtle. However, testing of the ability to perform a unipedal (one-legged) stance usually reveals impairments. During rehabilitation and beyond, emphasis should be placed on therapy and education to minimize fall risk in the home and community.

Individuals with SCI who can walk should generally be advised to avoid job situations requiring climbing ladders, or carrying heavy loads on foot. Instead, creative task substitutions should be sought. Use of a power or power assisted manual wheelchair for distances may be indicated. It is important for persons who can walk to maintain their strength and walking skills ("use it or lose it" approach) for functional tasks such as standing and reaching. Persons who previously worked in jobs requiring physical labor and have retained some walking ability may want to try to return to their former occupation. Employer negotiation is important to define appropriate and safe tasks.

29.2.3.7 Chronic Pain and Spasticity

Chronic pain and spasticity are particularly prevalent in people with spinal cord injury. Both require long-term use of medications in a significant proportion of individuals with chronic SCI. These medications can have side effects, notably the potential for sedation or dizziness, which need to be taken into consideration. The VR specialist will need to discuss with his or her client how to approach medication issues with employers. It is important to note that most medications can be adjusted so that, in the absence of new medical issues (such as a new urinary infection), excess sedation can be avoided. A primary justification for the use of medications such as narcotics would be the goal of decreasing pain enough to allow the person to better carry out activities, but not to the extent of causing drowsiness. Often, long-acting medications suit this purpose and are taken on a scheduled basis. Short-acting medications are used as needed for breakthrough pain episodes.

Chronic Pain

An important difference between acute and chronic pain is that acute pain resolves in a few weeks to months, whereas chronic pain persists. It can be classified by location (above the level of the injury, at the level of the injury, or below the level of the injury) or by the presumed cause (e.g., muscles, joints, nerves, viscera/internal organs). Chronic pain may interfere profoundly with daily activities. Persons with SCI and chronic pain have decreased social and workforce participation (Jensen et al. 2005; Rintala et al. 1998, 2005). Half or more of persons with SCI report pain, and at least a quarter have pain severe enough to require long-term use of medication. The overall impact on employment in the SCI population needs to be studied further, but clinical experience demonstrates that it prevents many persons with SCI from seeking work, or even getting out of bed. Chronic pain in SCI is also associated with depression, substance abuse, and nonadherence to medication and other medical treatments. Persons with chronic pain tend to be heavy users of healthcare facilities (Rintala et al. 1998, 2005; Siddall et al. 2003).

The term "chronic" implies that a medical cure has not been found, so the goal is to optimize control rather than cure. Persons with SCI may have pain from a variety of sources. Pain above the SCI may be related to arm and neck arthritis, tendonitis or peripheral nerve compression related to wheelchair propulsion, transferring from the wheelchair, reaching for objects, or use of assistive devices such as crutches. Pain may be at the level of the injury from injury to the bones, nerves, or spinal cord at that level. Also, many persons with SCI have undergone placement of metallic plates or screws to stabilize the spine. This can cause chronic pain in some individuals.

When nervous system injury is present, the dermatome (a band of skin corresponding to a nerve level) corresponding to the area of the injured spinal cord can be extremely sensitive to touch or other stimuli. Sometimes, regions of the body or the entire body below the injury can have increased sensitivity. Commonly, despite having little or no sensation to touch on their skin below their injury, persons with SCI report burning, freezing, aching, squeezing, shooting, or other sensations. A variety of terms that relate to nervous system-related pain, such as "neuralgia," "neuropathic (nerve-diseased) pain," "central pain," and others, are used in these cases. Other individuals may have chronic discomfort related to their colon or bladder. It is not uncommon for a person with SCI to have multiple different sites and causes of pain.

In addition to medications, treatments recommended by the entire interdisciplinary team are part of the armamentarium. Modalities such as transcutaneous electrical nerve stimulation (TENS), therapeutic recreation activities, and work are included. Work may be therapeutic to the extent that work can serve as a distraction from pain. Conversely, pain may occur and interfere with work activities. Persons with chronic pain and SCI may need skillful negotiation of their work responsibilities and schedule. They may only be able to maintain certain body positions for prescribed lengths of time and may require frequent changes in position or rest breaks.

Individuals with SCI may need medications for nerve pain, musculoskeletal pain, and spasticity all at the same time. They may need to take these indefinitely. Providers need to exercise care to minimize side effects (primarily excess sedation) and drug interactions. A fine line must often be walked to keep pain and spasticity under control while avoiding side effects. This is especially true in persons who need to drive to work and remain alert in the workplace. Pain "contracts" are often used for individuals on chronic opiate medications to clarify conditions for their use. Among the specifications in these contracts is strict avoidance of illicit substances. Employers often test for illicit drugs. Therefore, VR providers need to be aware when chronic pain issues exist and discuss this with their clients. Part of this discussion should include an agreed upon approach to employers.

Spasticity

Spasticity is a term that refers to a number of phenomena including muscle jumping or jerking, sudden tightening (tonus) or rhythmic involuntary contractions (clonus) of muscles. It may occur when the person is at rest or during attempted movement by the person and manifest as a "catch and release" or "quivering."

Spasticity affects the majority of people with spinal cord injury to some degree. Its severity varies widely, however, among individuals and can also vary greatly within a given individual based on other factors. Spasticity may or may not be uncomfortable to the person when it occurs. It occurs at or below the person's level of injury and may affect any involved muscle or groups of muscles, including the extremities, trunk, or abdomen. A recent study found that spasticity was negatively associated with life satisfaction, and, when at its worst, negatively correlated with vocational satisfaction (Westerkam et al. 2011).

Spasticity is typically treated if it causes pain or interferes with sleep or functional activities, such as walking or transferring to and from a wheelchair. Oral medications (such as baclofen, diazepam, and tizanidine), implantable medication pump delivery systems, and muscle injections can be used. Some of these medications can cause drowsiness and impaired cognitive function, especially if they are new, if the person is having the dose adjusted, or if the person is otherwise ill. For new spasms or an increase in a person's usual level of spasticity, however, the first step is to ensure appropriate positioning in the wheelchair, reduce irritations, such as infections or wounds that can trigger spasms, or to have the physician look for other medical/neurologic causes. A common scenario, for example, might be a new bladder infection causing an increase in spasticity.

Certain individuals with SCI may wish not to have spasticity treated with medications. They may use their spasticity to assist in functional tasks. Many people with spasticity find that it hampers transferring to and from their wheelchairs, but an individual might use a spasm to lock his or her knees and pivot transfer, for example.

People with SCI need to perform stretching to keep their joints loose and reduce the severity of spasms. This is recommended twice daily or more frequently if needed. If a person is seated for long periods, for example, they may feel very stiff and need to stretch out the tightness in their knees and hips. Standing wheelchairs, wheelchairs with elevating or swing away leg rests, and other equipment can be used.

Spastic jerks such as in the gluteal (buttock) muscles can be severe enough to cause a person to tip over backward in their wheelchair and can result in serious injury. Muscle spasms can also cause a person with SCI to slide out of their wheelchair or alter their position in the chair, requiring assistance with repositioning. Individuals with SCI should be taught in rehabilitation how to direct others, including coworkers, to assist them in repositioning or getting back into the chair from the floor.

29.2.3.8 Traumatic Brain Injury

Approximately 16–59 % of individuals who incur traumatic SCI incur a concomitant traumatic brain injury (TBI) as well (Elovic and Kirschblum 1999; Macciocchi et al. 2012). This is often referred to as “dual diagnosis.” The severity of TBI in persons with SCI varies widely, although most are mild to moderate. The effect of cognitive dysfunction and TBI on employment and suggestions for management are reviewed in separate chapters in this Handbook.

29.2.3.9 Depression

Rates of depression are several times higher among persons with SCI than in the general population (Consortium for Spinal Cord Medicine 1998b). Recently published studies found that 23 % of a community sample of persons with SCI have moderate depression (Fann et al. 2011).

Symptoms of depression can include feeling sad, down, or empty, lack of pleasure or interest, sleep disturbance, appetite changes, concentration problems, fatigue or lack of energy, feeling either slowed down or restless, and thoughts of death or suicide. As is the case for the general population, depression is associated with unemployment among persons with SCI (Crisp 2007; Fann et al. 2011). It is also associated with other secondary medical complications (Crisp 2007). For example, individuals with SCI are at risk for illnesses, such as urinary tract infections, which may present with depression or worsening of depression.

Unfortunately, depression is undertreated in this population (Fann et al. 2011). Undetected and untreated depression represents a greater burden of disability. Hence, all persons with SCI should be routinely screened for depression during primary care visits and referred for further assessment as needed. Treatment guidelines for those who are diagnosed with depression include antidepressant medications, psychotherapy, or a combination of both (Consortium for Spinal Cord Medicine 1998b). Effective treatment of depression is essential in order to reduce the disabling effects of this serious secondary complication and maximize the ability to participate in usual roles including work.

29.3 Spinal Cord Injury Rehabilitation

Individuals who sustain traumatic SCI may have any number of concurrent injuries, such as TBI (see above), fractures, peripheral nerve injuries, and secondary problems such as blood clots and infections. Those who survive the acute period generally require a period of inpatient rehabilitation. Some individuals may have recovery of strength or sensation below their injury; many do not. Regardless, SCI rehabilitation is aimed at maximizing functional abilities and substituting for lost functions as much as possible.

SCI rehabilitation is ideally carried out by an interdisciplinary team including physicians, nurses, therapists, psychologists, social workers, recreation therapists and, ideally, vocational rehabilitation specialists. The rehabilitation process should be "person-centered"; the client is the most important member of the team. Interdisciplinary SCI rehabilitation simultaneously addresses ongoing medical issues (as described above) and functional issues.

Physical therapists address mobility issues such as moving in bed, transferring out of bed to a wheelchair or toilet, wheelchair propulsion, and ambulation when appropriate. Occupational therapists address activities of daily living such as toileting, dressing, bathing, feeding, and intimate activity. Nursing staff help assure translation of functional skills taught by therapists into the person's hospital room. Psychologists and social workers address psychological status, adjustment to injury and other stressors, and help with finances and logistics of the medical rehabilitation care continuum.

As an illustration, a man with acute C6 complete tetraplegia and a mild concomitant traumatic brain injury 2 weeks after a motor vehicle accident may not have even left his hospital bed since the accident. He might not be able to turn in bed, get dressed independently, or get up to a wheelchair. These skills must be taught using residual function, technology, and assistance when appropriate. Eventually, he might be expected to be able to transfer with minimal assistance to a toilet, bed or chair, to propel a manual wheelchair on level surfaces, or operate a power wheelchair independently, to brush his teeth, comb his hair, and perform other grooming tasks with modified independence using specialized wrist splints, and to get dressed with minimal to moderate assistance of another person. For tasks that he could not perform independently, such as bowel care or daily range of motion activities, the rehabilitation team would teach him to direct the performance of these tasks by a caregiver following discharge from the rehabilitation setting. For his transfer skills, for example, a therapist might teach him to do this initially, and his nursing staff would assure that he continues to perform with the same level of assistance when in his room.

The process of inpatient rehabilitation following acute SCI typically requires 1–3 months or more. After discharge, further rehabilitation services are typically required as well. In addition, physical and emotional adjustments and learning can be a lifelong process. Many people with SCI require nursing or other physical assistance from hired caregivers as well as nursing agencies. Generally, the goal is to have the person return to the least restrictive environment in which they can safely function. The need for nursing and/or family can result in physical, emotional, and financial burdens to the person with SCI and their family unit. Resources are available for life care planning (Blackwell et al. 2001) and caregiver management (DeGraff 2002).

Ideally, all people with SCI would be provided expert vocational counseling early and often, continuing throughout the healthcare continuum—from the intensive care unit (ICU), to the rehabilitation unit, and into the outpatient setting. This would set up the expectation of returning to workforce participation, and help the person with SCI understand that work is possible regardless of their level and severity of injury. A "yes you can" approach is a good starting point for all healthcare providers. One rehabilitation physician with tetraplegia who was injured during medical school recently reported that, while still in the ICU, his neurosurgeon made it clear that he would "of course" return to his training and become a physician—"it was assumed that this is what I was going to do" (Sandel 2011).

Unfortunately, employment is more often not discussed until the end of a persons' rehabilitation or after discharge into the outpatient setting, when services tend to be more fragmented. This issue hampers and slows down efforts. Indeed, a common paradox noted in the literature and clinic setting is that a person with a new spinal cord injury is most connected to their rehabilitation team during their initial phase or encounters with rehabilitation, yet their interest in vocational issues may be quite low at this time as medical and psychological adjustments take precedence (Alfred et al. 1987). However, once disconnected from the team, they are at a disadvantage to address barriers to work participation without the skills and resources of rehabilitation professionals. A reasonable recommendation is to assess vocational issues while in rehabilitation and develop initial goals that can be revisited at later intersections with the healthcare system. Later chapter sections will offer some practical suggestions for guiding these clinical interactions.

29.4 Spinal Cord Injury and Employment

29.4.1 Employment Following Spinal Cord Injury

To provide a context for the discussion of vocational rehabilitation, we will briefly summarize relevant literature on employment, barriers, and predictors following SCI. For a comprehensive treatment of the subject, the reader is referred to reviews of the area (Lidal et al. 2007; Ottomanelli and Lind 2009; Young and Murphy 2009). These reviews all highlight the low employment rates among this population and include data specific to special populations such as US military veterans (Ottomanelli and Lind 2009) or an international perspective (Young and Murphy 2009) on the topic.

Rates of employment following SCI vary widely based on discrepancies in time of measurement and definitions of employment. In general, the average rate of any paid employment following SCI is approximately 35 %, which contrasts sharply with the 79 % employment rate reported for people without disabilities (Erickson et al. 2010). Recent employment data from the SCI Model Care Systems showed that 75 % of individuals with SCI were employed at the time of injury, 55 % were employed at some point following injury, but only 35 % were employed at the time of the survey (Krause et al. 2010a). This low rate of current employment has also been demonstrated in a recent study of US Military Veterans treated in the Veterans Health Administration (Ottomanelli et al. 2009a).

29.4.2 Effects on Quality of Life: Negative Effects and Positive Correlates

High rates of unemployment pose a deleterious effect on the overall quality of life and well-being of persons with SCI. Across the board, individuals with SCI who are unemployed fare far worse in terms of ratings of quality of life, adjustment, social integration, and satisfaction with life (e.g., Chapin 2001; Jain et al. 2007; Leduc and Lepage 2002; Westgren and Levi 1998). In fact, employment status has been shown to have more of an impact on life satisfaction than even the spinal cord impairment itself (Krause 1992a). There is evidence that employment is associated with psychological adjustment in a directional manner, such that transitioning from a position of unemployment to employment improves adjustment, and transitions from employment to unemployment worsen adjustment (Krause 1990, 1992b).

These research findings make sense, given that work is usually a central part of a person's identity. In act, it could be argued that work is the ultimate measure of participation in society. It is not surprising that studies show strong positive correlates for the minority of individuals with SCI who do return to work.

29.4.3 Barriers and Predictors for Work Participation Following Spinal Cord Injury

Low rates of employment following injury may not be surprising considering the numerous barriers faced by persons with SCI considering entering the workforce. In addition to the medical issues outlined above, issues such as transportation, the availability and expense of reliable caregivers and/or attendants, social security and other financial disincentives, and perceived and real attitudes by employers as well as health and rehabilitation providers all pose barriers. In the healthcare realm, simply not having adequate information about the availability and access to vocational resources appears to be a notable barrier (Crisp 1992; Ottomanelli et al. 2009a;

Wehman et al. 2000). There is information to suggest that there may be disparity in the knowledge of available vocational services based on injury severity, with individuals with tetraplegia less likely to be aware of vocational services than individuals with paraplegia (Ottomanelli et al. 2009b). Clearly, there is much room for improvement in terms of provider training about SCI-specific vocational issues; increased communication about return to work among providers, patients and their families; and increased consumer education about accessing vocational services and what to expect from vocational service providers.

Factors that are associated with returning to work following spinal cord injury include demographic variables, injury-related factors, employment history, psychosocial issues, and disability benefit status (Ottomanelli and Lind 2009). Education is the strongest predictor of return to work (RTW) (Krause 1992c). Being younger at the time of injury and living a longer number of years with SCI are both associated with more positive employment outcomes. Race and gender are also predictors of return to paid employment, with positive outcomes associated with being white and male (Arango-Lasprilla et al. 2010). Injury severity, particularly when functional ability is considered, has also been associated with RTW (DeVivo et al. 1987; Pflaum et al. 2006). Not surprisingly, working before or at the time of injury, particularly if one can return to their previous employment, has been predictive of RTW (DeVivo and Fine 1982; Pflaum et al. 2006). Conversely, receiving social security benefits was associated with a decreased likelihood of RTW (Dew et al. 1983).

Psychosocial issues, such as life satisfaction, locus of control, and motivational factors or expectations of work, also exert influence on RTW (Chapin 2001; DeVivo et al. 1987; Krause 1990; Krause and Broderick 2006; Murphy 2003; Schönherr et al. 2004). Being married or having social support can predict RTW as well (Hess et al. 2000; McShane and Karp 1993). Additionally, having reliable transportation has been associated with successful RTW (Lidal et al. 2007). Some of these psychological and social aspects are potentially amenable to change in the rehabilitation setting, as will be discussed later in this chapter.

29.5 Vocational Rehabilitation and Spinal Cord Injury

29.5.1 Research

There is a paucity of research on the effectiveness of vocational rehabilitation in improving employment outcomes following SCI. A PubMed search performed with the specific terms “vocational rehabilitation” and “spinal cord injury” rendered 80 citations. However, none of them were experimental studies of vocational interventions among this population. That being the case, the current state of knowledge regarding interventions for improving vocational outcomes following SCI will be considered in three categories. Clinical implications drawn are from: (1) published work on the broad topic of employment following SCI (i.e., nonexperimental survey or cross-sectional research), (2) case reports of individuals who have successfully returned to work, and (3) empirical evidence from a recently completed clinical trial of one type of vocational intervention in the population. This intervention study, carried out by the authors of this chapter, investigated the effectiveness of using a supported employment program in SCI Centers within the Veterans Health Administration.

29.5.2 General Guidance from the Literature

As described in previous chapter sections, there is a large body of literature concerning the predictors and barriers of successful return to work following SCI. Having some knowledge about the factors that impede or promote return to work puts us in the position of drawing clinical implications about what are likely to be critical elements when considering vocational rehabilitation for persons with SCI. Here we offer some recommendations found in the literature on vocational rehabilitation needs. This section is not meant to be an exhaustive list of all considerations but rather provides representative examples that illustrate some of the common themes found when considering the implications of employment-related studies.

29.5.2.1 Vocational Interests

Vocational interests influence receptivity and response to employment and vocational pursuits. Rohe and colleagues found that many individuals with SCI, particularly white males, have "realistic" vocational interests, meaning they prefer practical work, or working with their hands rather than with people or data (Rohe and Krause 1999). These interests remain stable despite their injury (Rohe and Krause 1999). Though there are no data linking vocational interests to employment rates, this inconsistency between their physical functioning limitations and manually oriented occupational interests likely poses a significant obstacle to returning to work after injury. These individuals are unlikely to want to pursue further education—a factor that would increase RTW likelihood. Perhaps they view education as something that is associated with job opportunities that are sedentary or data driven (e.g., "desk or computer jobs").

Vocational experts might assist individuals in bridging the gap between interests and abilities by considering a wide range of jobs within a given field. A recent study with a sample that included non-whites and women has shown that vocational interests actually vary as a function of race and sex (Krause et al. 2011). Among women and African Americans, there was higher interest in occupations that are described as "Social" (service oriented, extroverted), "Enterprising" (business-oriented, persuasive, value social status), and "Conventional" (orderly, value technical proficiency) compared with the reference groups. Seemingly, this bodes well, as these groups may be more open to considering a wider variety of occupational choices following injury. This line of research highlights the need to take into account individual differences and cross-cultural considerations when approaching vocational rehabilitation.

29.5.2.2 Balancing Expectations with Information and Support

The decision to pursue employment following SCI is undoubtedly influenced by multiple factors that are specific to the individual and their current situation. Considerations likely include issues such as lifestyle, developmental age and stage of life, financial situation, work/life experiences, adjustment/adaptation to managing their injury, caregiver and transportation support, and others. Qualitative studies have provided insights into influences on work expectations and decisions among persons with SCI. Fadyl and McPherson (2010) outlined several factors that influenced the decision to return to work in the first few years following injury. These factors included (1) ability to work given work demands and current resources (e.g., physical, emotional, and/or environmental), (2) presence of responsibilities or pressures that compete with work, (3) access to suitable jobs, and (4) whether work was beneficial enough to be worthwhile.

Expectations and needs are also likely to vary based on the age of the individual. For example, a recent qualitative study examined the expectations of return to work among a small sample of young adults in Sweden who were on sick leave and/or benefit status after SCI (Bergmark et al. 2011). Their responses described high expectations for participating in work coupled with a high need for guidance or support and uncertainty about where such support would come from. These participants also expressed difficulty formulating clear plans for securing or pursuing work. The authors concluded that young adults with SCI represent a vulnerable group, as they lack both education and work experience. Hence, they likely require tailored work supports. This seems especially important considering that having well-defined vocational goals is associated with employment among persons with SCI (Crisp 1992). Therefore, younger individuals may need more intensive career and educational planning services or perhaps may benefit from exposure to mentors who have successfully entered the job market post-SCI. Family education and support needs to be included to foster such plans.

Knowledge of the expectations and information gaps that present themselves in persons with new onset SCI underscores that the rehabilitation community is in a unique position to inform and support the decision process about work after SCI. The previous chapter sections on medical issues emphasize the importance of aggressive management of medical complications that often pose barriers and erode personal confidence to resume community and work participation. Additionally, psychosocial support to address adjustment issues and education regarding community resources may also reduce the perception that existing demands exceed resources. Practical problem solving regarding scheduling and managing new routines in different environments is helpful as well.

Assistive technology and equipment needs should be considered in terms of not only discharge from hospital to home but also plans to pursue work and should be revisited as these plans evolve and/or materialize over time. For those persons who do not believe that there is a suitable job for them following injury, contacting job specialists who have experience with successfully finding or creating jobs for persons with significant physical disabilities is critical. The person with SCI needs the assistance of knowledgeable vocational rehabilitation specialists who can explore options for return to work in the context of the person's current situation and their needs and desires. Finally, benefits counseling is critical to provide accurate information on the financial incentives and disincentives to working and/or what level of work fits best for their financial outlook. An informed decision about whether work is worth pursuing needs to be made in concert with benefits counseling. Finally, as other authors have noted (Schönherr et al. 2004), these interventions need to be provided by the rehabilitation team prior to the patient being discharged from the medical rehabilitation program.

29.5.2.3 Services

One study examined the relationship between service use patterns and vocational outcomes among persons with SCI in state vocational agencies in the United States (Marini et al. 2008). Of sixteen vocational services assessed, job placement was the most significant predictor of competitive employment. Of note, this particular service was also underutilized among this population. In discussing clinical implications, the authors recognized that while many individuals with SCI may not want or need selective placement, they would benefit from guidance in handling the "more subtle" aspects of SCI in the workplace (e.g., appropriate job leads, assistive technology issues, bowel and bladder management, or work accommodations).

29.5.2.4 Aging, Medical Complexity, and Injury Level

Older adults with disabilities due to SCI or other medical comorbidities may discontinue working earlier than younger, healthier cohorts, as may those with multiple medical complications. Various studies show that being older at the time of injury is associated with a reduced likelihood of returning to the workforce. This is of concern, since, as noted above, age of onset for SCI has increased over the past four decades (Krause 1992b; Lidal et al. 2009). This finding suggests that more attention needs to be paid to designing work programs for persons who are older. Older individuals are more likely to have established work patterns. While a work history itself is a good prognostic indicator for return to work, it may also mean that they may need some guidance and help in shifting to another area of work or adjusting how they approach working life. Additionally, they may require intensified help from rehabilitation professionals to address barriers (Johnson et al. 2010) and a longer period of vocational rehabilitation follow-up to sustain work (Conroy and McKenna 1999; Lidal et al. 2009).

As noted previously, studies indicate that persons with tetraplegia and/or more functionally severe injuries are less likely to return to work (Lidal et al. 2009) and there is some indication that they may also be less likely to be aware of vocational services than those with paraplegia or less severe injuries (Ottomanelli et al. 2009a). Special attention needs to be given to providing education and assistance to individuals with tetraplegia and those with more complex medical care issues. There could be a bias among rehabilitation providers in educating consumers about vocational rehabilitation, so efforts should be directed to ensure that all persons with SCI, regardless of injury severity, receive basic education about available resources and eligibility for vocational rehabilitation.

29.5.2.5 Focusing on Modifiable Variables

Many of the factors that are typically associated with return to work are static conditions related to injury or demographic factors, which are not modifiable. Certainly, it has been proposed that individuals at higher risk of unemployment, such as those who present with older age, higher or complete injuries, limited education, or minority status, need special attention or resources devoted to restoring work (Arango-Lasprilla et al. 2010; Krause et al. 2010a). Another approach is to focus on those variables that are modifiable through intervention. With education being the strongest predictor of return to work, it has long been regarded as the logical route to employment following SCI. Traditionally, there has been a considerable focus on education in terms of the importance of capitalizing on pre-SCI educational background in considering employment (Krause et al. 2010b), as higher education affords more occupational choices, particularly those that do not have manual labor components (Hess et al. 2000).

There is also evidence that re-training or additional education obtained following injury may not only improve the likelihood of re-entering the workforce but also have a positive role in sustaining work (Krause 1992c; Krause et al. 2010b; Tomassen et al. 2000). Hence, vocational counselors should carefully assess the educational background in terms of current vocational opportunities and recommend additional education as appropriate. Even those who already have a bachelor's degree may benefit from additional education post-SCI to maintain work for the long term (Krause et al. 2010a). (Special considerations for educational planning are discussed in the section on practice below.) However, there is some suggestion that those who did not obtain higher education pre-injury are unlikely to do so post-injury (Conroy and McKenna 1999). As we will discuss later, some vocational approaches favor rapid entry into the workplace rather than prevocational activities. These may be preferable routes for such individuals.

It may be fruitful to focus on other modifiable variables that, though less frequently studied, may be more readily amenable to change. For example, transportation has been identified as a primary barrier (Lidal et al. 2007) to employment in SCI. Obtaining access to reliable transportation, particularly for persons with high level complete injuries, who may not be independent drivers, may be a powerful means of improving the opportunity to participate in employment post-discharge (Conroy and McKenna 1999; Murphy et al. 2011). Likewise, social factors need to be an area of consideration in vocational planning. Both community integration and employment-related support from others can be powerful influences on post-SCI employment outcomes (Murphy et al. 2011).

Rehabilitation planning for vocational issues may need to include assessing the level of community integration and social support as it pertains to future employment opportunities. Gaps in either of these areas may need to be addressed to increase success in RTW. Peer support for return to work has been mentioned as important (Conroy and McKenna 1999). Future research on these and other modifiable factors along with clinical experience may suggest other areas that are amenable to change and can improve employment outcomes.

29.5.3 Published Case Reports

Case reports provide valuable real world illustrations of what factors are involved in returning to work and keeping a job following SCI. Wehman and colleagues published a series of case reports that portray how supported employment approaches have been applied to help individuals with SCI overcome barriers and return to work

(Inge et al. 1998; Targett et al. 2004; Wehman et al. 1994). Supported employment approaches are used to help persons with serious disabilities move directly into competitive jobs in the community by providing tailored job support including job coaching and assistive technology services. Using a case study approach, Targett et al. (2004) described how such supported employment practices of individualized and ongoing support can help overcome some of the barriers that are commonly faced by persons with SCI in order to achieve gainful employment. For example, a job specialist using this approach may help a person problem solve issues concerning personal care routines that impact work participation, such as use of reliable caregiver assistance, managing toileting needs either before or during the work day, eating and drinking with the aid of devices or others if needed, exploring accommodations, and accessibility issues. Once such issues are identified, a job specialist would then consider how to provide job supports in the workplace.

A case is presented of a man with complete tetraplegia below the fifth cervical level (i.e., C5 tetraplegia) who did not have any use of his hands or legs and used a power wheelchair for mobility. This person had been injured for almost 10 years and had less than a high school education. A job support plan was put in place that allowed him to accept a job as a parking lot attendant and then, at his request, transition to a position as a dispatcher. The plans developed included supports such as worksites located on the paratransit route, using willing coworkers for minor assistance with manual job tasks (e.g., handling tickets) and care needs (re-filling his water drinking system on his power wheelchair) when needed, and various accommodations (e.g., installing a ramp or using a voice recorder). This case report nicely illustrates how return to work is possible following SCI with the appropriate supports. Other published reports illustrate roles of the employment specialist in providing a wide range of workplace supports which, in combination with assistive technology services, facilitated return to work among several individuals with tetraplegia (Inge et al. 1998).

29.5.4 An Interventional Study: The Spinal Cord Injury Vocational Integration Program (SCI-VIP) Trial

In 2005, the current authors received funding to implement a multicenter randomized clinical trial of a supported employment approach to improve vocational outcomes compared to standard care among Veterans with SCI (Ottomanelli et al. 2009b).

Evidence-Based Supported Employment (EBSE), also known as Individualized Placement and Support (IPS), is a standardized approach to help individuals with mental illness gain and maintain competitive employment in the community (Becker and Drake 2006; Bond 2004). In this model, the focus is on rapid acquisition of jobs that are consistent with the client's preferences and interests rather than on spending time in prevocational activities such as training and testing. All consumers are considered eligible to start work regardless of the disability severity level. Integration with the client's current treatment team is a central component of care delivery. There is a large body of evidence documenting the effectiveness of "high fidelity" EBSE programs (those that adhere closely to evidence-based principles) with individuals with mental illness (Bond et al. 2008, 2011). The goal of the SCI-VIP study was to translate and test the EBSE model among a population of persons with physical disabilities, namely SCI. The purpose of the study was to examine if supported employment (SE), following evidence-based principles, was more effective than treatment as usual (TAU) for vocational issues in helping persons with SCI return to competitive employment. It was the first prospective, multisite, randomized, controlled trial of supported employment versus standard vocational rehabilitation care in a population of veterans with SCI. As it is the only interventional vocational study to date that we are aware of, it will be discussed in some detail here.

The study involved 201 veteran participants who had a spinal cord injury, were aged 18–65, and received medical and/or rehabilitation healthcare services in the SCI Centers at one of six participating Veterans Affairs Medical Centers (VAMC).

Participants completed a baseline interview and were followed for 12 months. On average, subjects were 48 years old, had 13 years of education, and had lived with their SCI for 12 years. The majority (72 %) of the sample had never been employed post-injury (Ottomanelli et al. 2009a). They were largely an outpatient population living with chronic SCI in the community, rather than a newly injured population in acute rehabilitation.

In brief, at interventional sites, subjects were randomized to SE or treatment as usual (TAU-IS). At observational sites, the supported employment (SE) condition was not available and all subjects received treatment as usual (TAU-OS). Those in the SE condition received the Individual Placement and Support (IPS) model (Bond 2004) of SE. Key features of this model included integrated vocational and medical rehabilitation treatment, rapid engagement in job finding, focus on competitive employment, inclusion regardless of severity or type of disability, ongoing job support, and an emphasis on participant preferences. These services were primarily provided in the community, rather than in office or hospital settings, and access to personalized benefits counseling was included. The provision of SE services was by a Vocational Rehabilitation Counselor (VRC) who was hired for the study, trained in the IPS model, and integrated as a provider among the interdisciplinary care team in the SCI Center. The treatment as usual (TAU) condition typically involved referrals to vocational rehabilitation services outside the VA SCI Center.

In the TAU condition, there was not a single provider of VR services who was part of the SCI interdisciplinary care team at the SCI Center. Rather, participants in the TAU condition were referred by the research coordinator back to their clinical SCI interdisciplinary team members (e.g., physiatrist, psychologist, social worker); they provided them with a referral to an agency or provider who was not part of the SCI Center (e.g., state VR).

Detailed results of this study are reported elsewhere (Ottomanelli et al. 2012). The primary outcome of the study was that the veterans who received SE were two and a half times more likely to achieve employment than those who received treatment as usual at interventional sites. When veterans who received SE were compared to those who had no exposure to SE in their SCI Centers (the TAU-OS group), they were over ten times more likely to achieve employment. SE subjects accounted for 50 of 72 (69.4 %) jobs and were significantly more likely to achieve competitive employment (25.9 %; 95 % CI: 17.6–36.5) compared to either TAU-IS subjects (10.5 %; 95 % CI: 3.6–17.4; $p<0.008$) or TAU-OS subjects (2.3 %; 95 % CI: 0.0–12.9; $p<0.002$).

It is quite likely, and consistent with our clinical observations, that the presence of SE in the medical center elevated the awareness and attention to vocational issues and outcomes in general. At centers where SE was offered, the clinical providers were more likely to ask their patients about employment status and interest level in pursuing vocational rehabilitation, whereas in centers where only standard care was in place, it is unlikely that there was a detectable change in provider behavior related to vocational issues. This finding supports the positive effects of having a vocational program in place within the setting where SCI patients receive their care.

In examining these data, in combination with our 5-year experience in implementing and testing the evidence-based supported employment model, there are several lessons learned worth consideration.

29.5.4.1 Integration of Vocational Services Alongside Other Medical and Rehabilitation Care for Persons with SCI Improves Outcomes

A critical feature of the EBSE model of vocational care is that it is seamlessly integrated with the other health and rehabilitation care the person is receiving at the time. This is contrasted with the typical clinical practice in many SCI centers of referring persons with SCI to other providers outside the treatment team. Such referrals are likely to lead to insurmountable challenges at many levels.

In our experience, relatively few of the individuals with SCI who are referred to vocational rehabilitation actually participate and receive any meaningful level of VR. This issue could be due to problems accessing care, including motivational factors that make navigating large (and often overwhelmed) state systems difficult. Moreover, there needs to be a strong connection between vocational experts and the clinical care team in order to manage the multiple medical issues while the individual is in the process of pursuing employment, and then address them at follow-up in order to sustain employment.

29.5.4.2 Having a Visible Vocational Program in the SCI Center Elevates the Awareness and Attention to Vocational Issues Among Providers and Consumers, Potentially Contributing to Improved Outcomes

Prior to implementation of this large study, relatively little attention was given to employment among the providers in the clinical setting or among the veteran consumers. We believe that without a reliable and available means of ameliorating the problem of unemployment, there was little motivation on the part of either party to recognize and address the problem.

29.5.4.3 Education of Consumers and Providers About the Implications of Unemployment and SCI as Well as Specific Treatment Options Is Essential

Implementation of the study involved a considerable ongoing collaborative educational process about the importance of employment and available resources. This was an ongoing process among vocational providers, SCI clinical staff, and the veterans they serve. It was essential that providers at all levels, including doctors, nurses, therapists, psychologists, and social workers, talk to their patients about employment and vocational rehabilitation. To enact this change, providers and consumers needed information on employment outcomes, their correlates, and methods of improving them.

29.5.5 Future Research

Clearly, much more research is needed to evaluate the effectiveness of specific methods of vocational rehabilitation among this complex population. Information about the optimal timing of services and outcomes is critically needed. The above study largely drew from an outpatient sample of persons who had been living with chronic SCI. It would be helpful to have studies of vocational rehabilitation among an acute population in rehabilitation settings. It could be that this early stage in recovery represents a critical window of opportunity for addressing employment outcomes, particularly in regard to setting realistic and attainable goals with patients. More information is also needed regarding the optimal level, intensity, and type of services needed to maximize outcomes. Furthermore, research is needed about how to support and sustain persons with SCI in the workforce over time. It is not enough to know what predicts return to work. We need to know what helps people return to work and what helps them sustain it.

With these issues in mind, the authors are conducting longitudinal research on the use of EBSE in SCI to examine employment outcomes over time and individual and program factors that improve outcomes and quality of life. Research in other care systems and settings, along with research on how to improve access and delivery of existing services, is much needed as well.

29.5.6 Talking with Patients About Employment

We have previously alluded to the importance of providers addressing employment with their patients in the healthcare setting. Here we discuss practical ways to talk with patients about employment. Sometimes providers are reluctant to bring up issues that they themselves may view as hopeless, or perhaps there is some sensitivity or hesitancy to bring up an issue that could potentially embarrass or depress a patient. Like addressing other difficult health challenges such as obesity, smoking, or sexuality, addressing unemployment can be uncomfortable for the uninformed or inexperienced provider. We have found the opposite to be true; that is, by recognizing an issue as a valid concern it sets the stage for open discussion and forward movement toward positive change. In this regard, we have found adapting the PLISSIT (Annon 1976) model to address work issues to be useful.

The PLISSIT model for discussing sexuality with clients was developed in the 1970s and is still in use today. In this model, P = permission, LI = limited information, SS = specific suggestions, and IT = intensive therapy. The PLISSIT model was developed as a framework for addressing sexual healthcare needs among persons with chronic illness and disability. It is a helpful model in that it enables the provider to assess where the person is at in addressing the issue, and then gear the intervention accordingly. We have advocated for using a similar approach for providers wanting to address unemployment after injury.

29.5.6.1 Applying a PLISSIT Approach for Addressing Work Issues

Permission:
Just as providers can give clients permission to be sexual beings, we can also give them permission to pursue employment. Permission-giving means creating a setting where the issue of unemployment is explicitly recognized, and thereby validated, as an important consideration. Examples include the following:

- Displaying visible material in the clinical setting about employment, such as posters or pictures of persons with SCI in the workplace, and brochures in the clinic on available vocational rehabilitation resources.
- Routinely asking at initial assessments and outpatient evaluations about work.
  - "Ok, we are going to be covering a variety of issues during this evaluation including your current health status, emotional well-being, sexuality, and employment goals…."
  - "I see here in your medical records that you were working at the time of your injury. Have you considered going back to work?"
  - "Many people with SCI want to go back to work but are unsure how. Have you thought about this area of your life?"

Limited Information:
Providing "Limited Information" about employment means providing basic reassuring information based on facts. Examples include:

- Discussing current employment-related outcomes and sharing the concept that work is a viable goal for patients with SCI.
  - "We have found that persons with spinal cord injury, regardless of their level or severity of injury, have been able to return to work if they so desire."
  - "Did you know that studies have shown that people with SCI who are working are more satisfied and healthy?"

Specific Suggestions:
It is important to provide practical information to assist people in addressing barriers to return to work. Examples are:

- Information on where to get started in pursuing vocational goals.
- Specific ideas for managing chronic healthcare issues such as bowel and bladder concerns, pain and spasticity, and skin integrity.
- Assistance with caregiver or community services to address transportation or caregiver issues.
- Ask the patient what medical issues would get in the way of working, and actively work with the patient to address these issues.
- Referral to local, state, or federal agencies that help individuals understand their benefits, and examine available work incentive programs they are eligible to receive.

Intensive Therapy:
This intervention would involve referrals to specialized services and providers to address or support vocational goals. Examples include:

- Enrollment and engagement of the consumer in a specific program of vocational rehabilitation. Healthcare providers may need to initially be quite assertive in reaching out to local programs and support services.

- Referral to an Employment Specialist or Vocational Rehabilitation Counselor (preferably one with expertise in helping people with SCI).
- Referrals for therapies to support work goals by addressing barriers:
  - Psychotherapy
  - Occupational or physical therapy
  - Assistive technology or rehabilitation engineering
  - Rehabilitation physician or medical provider.

By adopting a PLISSIT approach to employment, we can set the stage in the healthcare setting to consider return to work, and then we can respond accordingly with appropriate information, supports, and referrals for vocational goals, depending on the patient's needs at that given time. We encourage these discussions to begin early on in the rehabilitation process and to be revisited at regular intervals in the outpatient care clinics.

29.5.6.2 A Few More Words About Education and Training

Education is a recognized route to employment opportunities for many individuals, both able bodied and disabled. Given the strong association between education and employment, it would be easy to assume that persons with disabilities that have or seek additional training are competitive in the workforce. However, we recognize that it is not a path that everyone with SCI may be willing or able to take, nor is education a guaranteed avenue to employment. As mentioned, many individuals with SCI may not be inclined to pursue further education or training (Rohe and Krause 1999). There needs to be a path to employment for everyone who is interested. Some individuals may be better served by starting with vocational programs that focus on rapid job search and placement, or on-the-job training opportunities.

When individuals with SCI are interested in further education, academic plans need to be coupled with careful consideration of the end goal of employment. Resources and funding are available (through state VR and/or veterans' programs) that persons with new injuries can obtain. Too often, persons with disabilities immerse themselves in an educational program and emerge several years later with a degree, but no identifiable path to employment. Often at this point, they are less connected to their rehabilitation center and healthcare team. An education plan needs to include the expertise of vocational counselors and timelines and provisions for support in job seeking, acquisition, and maintenance. It is advisable to seek and include such services concurrently, rather than wait until graduation.

29.6 Summary

In this chapter, we provided an overview of the medical aspects of SCI, addressing the critically important area of managing sequelae in order to maximize the potential for work participation. There is scant literature on proven interventions to ameliorate poor work outcomes for this population. We highlighted common themes in terms of typical clinical implications written about in the broader area of research on employment and SCI, and shared published case reports in way of offering examples from the literature on addressing work.

We also shared our learning experience using Evidence-Based Supported Employment via a randomized controlled trial. This trial showed that at least one method of integrated vocational care in SCI rehabilitation was more effective in improving work outcomes than referrals outside of the rehabilitation care setting. Much more research is needed to elucidate specific methods of vocational rehabilitation that are effective at initiating and sustaining employment among this complex population. Interwoven throughout this chapter is practical information that rehabilitation professionals will want to consider to assist their patients in pursuing employment. Finally, we offered some additional suggestions for talking

Box 29.1 Top Ten Suggestions for Rehabilitation Professionals to Improve Work Outcomes Following SCI (Mnemonic: THANK JOBS)

1. *T*alk to patients about work.
2. *H*elp manage medical issues to mobilize and get people out;
3. *A*sk about vocational issues and plans in interdisciplinary team meetings;
4. *N*etwork with others interested and committed to helping persons with SCI or other disabilities return to work;
5. *K*now your community and medical center vocational rehabilitation providers;
6. *J*ob specialists need to be invited and included in medical rehabilitation care settings for appropriate vocational planning, early and often;
7. *O*btain assistance from state vocational rehabilitation programs and Department of Veterans Affairs programs (emphasis on obtaining services, not just making referrals);
8. *B*enefits counseling referrals (e.g., to local, state, or federal agencies or to Paralyzed Veterans of America [PVA]) should be a routine part of care following injury;
9. *S*ervices should be ongoing; revisit needs as goals, objectives, and challenges change;
10. *S*upport should be collaborative. Encourage and empower clients as they formulate plans and navigate obstacles.

with patients about work and implementing these suggestions (see Box 29.1).

In summary, employment has long been held up as the ultimate illustration of a successful rehabilitation outcome. Although we live in an age where there are many advances in terms of physical rehabilitation, technology, and legislative action, improvements in employment outcomes remain elusive, and vocational issues are still insufficiently addressed in many rehabilitation settings. While the lack of both empirically validated treatments in the field and specific vocational programs or providers within physical rehabilitation centers certainly poses challenges, there are practical action steps that all providers can initiate now to give hope and direction to persons with SCI for a future that includes a working life and potential accompanying benefits. We hope that this chapter gives permission to everyone who knows or works with individuals with SCI to initiate practice patterns that facilitate participation in the workplace.

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Return to Work and Job Retention Strategies for People with Multiple Sclerosis

30

Phillip D. Rumrill

30.1 Introduction

Although the vast majority of people with multiple sclerosis (MS) have employment histories and most were working at the time of diagnosis, the onset and continuation of the disease prompt what appears to be a mass exodus from the labor force. Encouraging advances in the medical and pharmaceutical sciences have enabled many people with MS to live healthier, fuller, and more active lives than was possible two or three decades ago, but improvements in functional capabilities for many people with MS have not translated directly into improved employment outcomes.

Vocational rehabilitation experts have pointed to the episodic and unpredictable nature of the disease, the wide range of physiological and neurological symptoms, and a fundamental negative bias on the part of employers toward workers with chronic health conditions as partial explanations for the significant attrition from the workforce that seems to accompany diagnoses of MS. The need for improved return to work and job retention services for people with MS is born in the expressed desires of unemployed people with MS, most of whom left the workforce voluntarily, believe that they still have the ability to work, and would like to return to their previous occupations.

The purpose of this chapter is to highlight selected return to work and job retention considerations for people with MS. The chapter begins with an overview of the medical and psychosocial aspects of the disease, followed by a description of the factors associated with the low rate of labor force participation reported by people with MS. Then, selected return to work and job retention interventions that have proven effective for people with MS are described. Throughout the chapter, readers will note an emphasis on early intervention, consumer advocacy, job accommodations, and effective communication with employers as key elements of effective return to work programming.

30.2 Medical and Psychosocial Aspects of Multiple Sclerosis

MS is one of the most common neurological diseases in the world. It is a degenerative disease of the central nervous system, primarily affecting the brain and the spinal cord (Fraser et al. 2006). MS destroys the fatty tissue called myelin that surrounds white matter tracts (i.e., axons) in multiple locations in the brain and along the spinal cord. The purpose of the myelin is to facilitate the

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axons' conduction of electrical impulses back and forth from the brain to the rest of the body via the spinal cord (Schapiro 2003). In areas where the myelin is destroyed or compromised, these electrical impulses, which coordinate all mental and physiological processes, are not conveyed effectively. This slowed or blocked conduction of information can have a disruptive influence on virtually every physical, sensory, mental, and emotional activity.

Smith and Schapiro (2004) described the demyelination that occurs in MS as similar to the disruption of an impulse or message that would occur if the rubberized coating surrounding a telephone or electrical wire were torn or cut. Such damage interferes with the transmission of information and/or electricity, which is what happens in individuals with MS. For people with MS, the results are often uncoordinated and/or awkward responses to environmental stimuli (Schapiro 2003). As patches of myelin deteriorate, they are replaced by scar tissue. The resulting lesions, or plaques, further interrupt the conduction of nerve impulses, sometimes creating a progressive and degenerative course of symptoms.

Symptoms associated with MS vary widely depending upon the location and size of the lesions in the person's brain and spinal cord (Herndon 2000). For example, frontal and parietal lobe lesions often result in cognitive and emotional effects, whereas plaques in the cerebrum, brain stem, and spinal cord tend to cause problems related to the physical functioning of the extremities (Fraser et al. 2002). Visual impairments may result from direct damage to the optic nerves or the occipital lobe.

The National Multiple Sclerosis Society (NMSS 2012) estimated the prevalence of MS in the United States to be about 400,000 cases. This means that approximately 1 in 750 Americans has the diagnosis at any given time (Fraser et al. 2006). It has been estimated that 10,000 new cases of MS are diagnosed each year in the United States, and this rate of incidence has steadily increased since the 1950s. This heightened rate of detection has been attributed to the advent and refinement of increasingly sensitive diagnostic tools such as magnetic resonance imaging (Kalb 2012).

Although MS can occur at any age, initial symptoms are most often evident during early adulthood, typically between the ages of 20 and 40 (Schapiro 2003). In fact, half of MS diagnoses are conferred before the person's 30th birthday, and three-quarters of Americans with MS were diagnosed before the age of 40 (Fraser et al. 2006). MS is two to three times more common in women than in men, a gender link that is found in a host of other autoimmune diseases (NMSS 2012).

Epidemiological studies have revealed higher MS prevalence rates in temperate regions of the globe than in warmer climates. Countries that have particularly high rates of MS include the United Kingdom, Canada, Germany, Denmark, Norway, Sweden, Finland, and the United States (Smith and Schapiro 2004). Two-thirds of the American MS population resides in the northernmost 50 % of the general populace, with the states of Vermont and Washington reporting the highest prevalence rates in the United States (Fraser et al. 2006).

In terms of racial and ethnic risk factors for MS, Poser (1987) pointed out that MS is extremely uncommon among Asian peoples, unknown in African blacks, and relatively infrequent among African Americans. He also noted that people of Hispanic descent are far less likely to develop MS than those of Germanic, Anglo-Saxon, and Scandinavian lineages. More recent studies of the racial and ethnic characteristics of people with MS have yielded similar findings (Schapiro 2003).

Although studies show that certain racial or ethnic groups are more likely to acquire MS than others, how and why MS originates in an individual remains less certain. Medical scientists have determined that MS involves an autoimmune process; that is, the immune system abnormally directs itself against the central nervous system. Although the exact antigen to which immune cells are directed has not been identified, researchers have discovered which immune cells become sensitized, the process by which they turn on the central nervous system, and which receptors on the cells are attracted to the myelin sheath (Burks and Johnson 2000).

MS is not hereditary per se, but having a first-degree relative (e.g., a parent or sibling) who has the illness increases one's risk of acquiring MS by a factor several times that of the risk in the general population (Coyle 2000). Being the daughter of a person with MS makes one ten times more likely than the general population to acquire the disease during adulthood (Fraser et al. 2006).

Current classification standards in the field of neurology describe four types or courses of MS: (a) relapsing-remitting, (b) primary progressive, (c) secondary progressive, and (d) progressive relapsing (Schapiro 2003). Smith and Schapiro (2004) described relapsing-remitting MS as marked by clearly defined flare-ups (also called relapses, exacerbations, or attacks), lasting from days to weeks, with or without asymptomatic periods, beginning at the onset of the disease. These flare-ups are episodes of acute worsening in neurological functioning and they may be totally unpredictable. They are followed by recovery periods (remissions), which are either partial or complete. Schapiro (2003) noted that about 80 % of MS cases begin as relapsing-remitting MS, making it the most common form of the disease at the time of diagnosis.

Primary progressive MS is observed when the person experiences a slow but steady decline in functioning from the onset of the disease. In this course, there do not appear to be noticeable relapses or remissions (NMSS 2012). If a person does experience a plateau, it is temporary and improvement in symptoms is minor. Primary progressive MS is commonly diagnosed in people who develop the disease after their 40th birthday (Schapiro 2003), and this group makes up about 10 % of the MS population (Fraser et al. 2006).

Secondary progressive MS is characterized by initial relapsing-remitting MS that later develops into a steady progressive course, with or without flare-ups, remissions, or plateaus (Barnes 2000). Over time, secondary progressive MS results in a decline in the person's general health (Fraser et al. 2006). It is estimated that about two-thirds of people diagnosed with relapsing-remitting MS eventually develop the secondary progressive form of the disease.

In progressive relapsing MS, the person experiences a steady and progressive course of declining health over time, but she or he also has clear and significant exacerbations or relapses that occur without warning (NMSS 2012). Symptoms are always present, but they may intensify or decrease in severity from time to time (Schapiro 2003).

Regardless of the course of the disease, the constellation of physiological symptoms of MS extends over a wide range, including fatigue, mobility problems, spasticity, numbness and tingling in the extremities, tremor, diminished strength and coordination, chronic pain, hypersensitivity to heat, visual impairments, bowel and bladder dysfunction, and sexual dysfunction. As previously noted, patterns of symptoms have been attributed to the location and size of lesions in the central nervous system and are specific to the individual (Fraser et al. 2006). Even within the individual with MS, physiological and other effects may come and go without warning, appear in various combinations, or intensify in a seemingly random pattern (Kalb 2012).

As if the physiological accompaniments of MS were not debilitating enough, the illness often has a negative impact on one's cognitive abilities, affective responses, and coping skills. Polman et al. (2006) estimated that as many as 60–65 % of people diagnosed with MS experience some degree of cognitive impairment that affects their attention, conceptual reasoning, executive functioning, social judgment, and memory—again depending on the location of lesions in the brain. Polman et al. also noted that "psychiatric morbidity is increased in MS, with over 50 % of patients being symptomatic at some stage" (p. 85). Foremost among the affective disorders experienced by people with MS is depression. Studies repeatedly show that approximately one-half of all people with MS experience at least one major depressive episode during the course of the illness (McReynolds and Koch 2001). Bipolar disorder is diagnosed in approximately 15 % of people with MS (LaRocca 2004). Euphoria, a persistent feeling of well-being and optimism in spite of negative circumstances, is often exhibited by people with MS in isolation of other symptoms (McReynolds and Koch 2001). Anxiety disorders and other mental conditions are also common, although they are often treated effectively with anti-anxiety medication.

The far-reaching physiological and psychological accompaniments of MS make it one of the most difficult diseases to cope with, adjust to, and, ultimately, accept (Rumrill 1996). The adjustment and social issues inherent to MS remain among the most difficult effects of the illness to treat.

Just as no certainty exists as to the cause of MS, no treatment modality has been reliably demonstrated to prevent the onset of the illness, progression of central nervous system lesions, or development of new lesions. Moreover, no medical procedure has been developed to alter or dissipate existing lesions. However, adrenocorticotropic hormones and corticosteroids (i.e., prednisone), along with emergent medications such as Avonex, Betaseron, Copaxone, Novantrone, Rebif, and Tysabri (NMSS 2012), have been shown to reduce the severity of exacerbations among some people with MS. Such treatments as fat-free diets, sunflower oil, bee stings, and vitamin supplements have not proven efficacious in definitive clinical trials.

Most MS treatments have been oriented toward catalyzing the body's own immune responses to neurological irregularities. One of the problems in evaluating the efficacy of such treatments is that it is impossible to determine whether improvements or remissions are the results of the treatment or of the natural course of the illness. Physicians have the ability to specify MS treatment regimens to an individual's course and symptoms (Schapiro 2003), but the search continues for curative treatments that will prevent or arrest the underlying agents of the disease.

30.3 Multiple Sclerosis and the World of Work: Factors Associated with Employment Status

As previously noted, the onset of MS typically occurs between the ages of 20 and 40—a time many regard as the "prime of life." From a career development standpoint, those years are the most active decades of most people's lives. According to Super (1980), the period between ages 20 and 40 is typically marked by (a) exploration (gathering and processing occupational information to formulate career goals), (b) establishment (forging a plan for attainment of those goals and beginning a career), and (c) maintenance (advancing in one's career and attaining his or her goals) activities. For many people with MS, however, the career development process slows and, in many cases, stops after the illness begins to manifest itself.

More than 90 % of Americans with MS have employment histories; that is, they have worked at some time in the past (Rumrill et al. 2008). Some two-thirds were still working at the time of diagnosis, even given the lengthy time period that often intervenes between the onset of initial symptoms and diagnosis (LaRocca 1995). As the illness progresses, however, people with MS experience a sharp decline in employment; Fraser et al. (2002) estimated that only 20–30 % of Americans with MS are employed 15 years after diagnosis, and less than half of people with MS in the United States are currently employed (Rumrill et al. 2008).

Not surprisingly, Americans with MS are gravely concerned about the bleak employment prospects that await them following diagnosis with this intrusive and interruptive disease. In a 2003 survey of 1310 adults with MS from ten states and Washington, DC, Roessler et al. (2003) found the majority of respondents were dissatisfied with 29 out of 32 high-priority employment issues. Majorities of people with MS were satisfied with only three items: their access to service providers (51 %), the treatment they received from service providers (61 %), and the encouragement they received from others to take control of their lives (56 %). The employment concerns

Table 30.1 Priority employment concerns among people with MS, ranked by dissatisfaction ratings (Rumrill et al. 2008)

Item (people with MS…)	% Dissatisfied
Have adequate financial help to stay on the job.	81
Have access to reasonably priced prescription medications.	78
Know their rights regarding job-related physical examinations.	77
Have assistance in coping with stress on the job.	76
Know about available employment and social services.	75
Have their needs considered in the development of Social Security programs.	74
Have adequate health insurance so that they can recover and return to work.	73
Are treated fairly by employers in the hiring process.	73
Receive up-to-date, easily understood information about benefits and work incentives from the Social Security Administration.	72
Have opportunities for home-based employment.	72
Can work with employers and supervisors who understand the effects of MS.	71
Have adequate help in comparing fringe benefits, particularly health insurance coverage, among different job options.	71
Have adequate knowledge of the employment protections of Title 1 of the Americans with Disabilities Act.	70
Have adequate information about short- and long-term disability.	70
Have adequate information on provisions of the Family and Medical Leave Act.	69
Can get retraining if it is required to return to work.	68
Are considered for other jobs in the same company if their disabilities prevent them from going back to their own jobs.	66
Are prepared for real jobs in real work sites.	65
Are helped to find employment for which they are prepared.	65
Are treated fairly when they apply to work.	64
Have transportation needed to travel to and from work.	64
Are given support from employers and supervisors after returning to work.	63
Can get help with the cost of assistive devices.	63
Are encouraged to work part time if full time is too difficult.	59
Receive reasonable accommodations in the workplace.	58
Have confidence in their potential to work.	58
Can get help in identifying and designing workplace accommodations.	58
Receive the same pay as would a person without disabilities.	53
Have access to adequate information about Social Security programs.	52

items with the highest dissatisfaction ratings clustered into three thematic categories: implementation and enforcement of the Americans with Disabilities Act, healthcare and health insurance coverage, and Social Security disability programs. Table 30.1 presents the 29 employment concerns items that were identified as problematic by the majority of respondents, in descending order of dissatisfaction ratings (Rumrill et al. 2008, pp. 33–34).

For many years, medical, psychological, allied health, and rehabilitation researchers have sought to understand why people with MS make a premature, mass exodus from the labor force, usually of their own choosing, and often before the disease has rendered them incapable of working. Indeed, among people with MS who are unemployed, 75 % left their jobs voluntarily (Roessler et al. 2002), 80 % believe that they retain the ability to work (Sumner 1997), and 75 % say that they would like to re-enter the workforce (Rumrill 2006). In the endeavor to explain the disengagement from work that characterizes this well-trained and work experienced population, the demographic, disease-related, and environmental factors associated with employment status have been a primary focus.

30.3.1 Demographic Factors

Although the jobless rate among Americans with MS is disappointingly low for both sexes, women are significantly less likely to be employed than are men (LaRocca 1995; Roessler et al. 2001). Roessler et al. (2003) reported jobless rates of 67 % for women with MS and 51 % for men with MS in their national survey. Roessler et al. (2004) found that American women with MS are nearly twice as likely to be unemployed as their male counterparts. Canadian citizens with MS appear to experience similar gender disparities when it comes to labor force participation; Edgley et al. (1991) reported unemployment rates of 58 % and 70 % for men and women, respectively.

Both men and women with MS are more likely to leave the workforce if they have a spouse who is working (Rumrill et al. 2008). People with MS who have higher levels of education and/or more money in savings and investments are more likely to be employed than are those in lower socioeconomic strata (Edgley et al. 1991; Roessler et al. 2004). This finding may not be surprising given that people with higher levels of education tend to occupy positions that require less physical exertion, and the physiological effects of MS therefore may not impose work impediments to the extent that they do for those whose jobs require more physical exertion (Rumrill et al. 2008). Rumrill (2006) noted that higher-level employees have more flexibility and autonomy in modifying their jobs to meet their MS-related needs. Indeed, employers are generally more likely to accommodate workers who are viewed as talented and essential to the operation of business than they are to meet the needs of less valued workers (Sumner 1997).

In a survey of 1180 Canadians with MS, Edgley et al. (1991) found unemployment to increase as a linear function of age. Respondents between the ages of 20 and 29 reported a 38 % jobless rate, significantly lower than those rates indicated by their counterparts at ages 30–39 (57 %), 40–49 (70 %), 50–59 (84 %), 60–69 (87 %), and 70 and over (93 %). The relationship between age and unemployment in people with MS has been upheld in several studies in the United States (Rumrill et al. 2008). LaRocca et al. (1985) presented findings indicating a curvilinear direction of that relationship; they found middle-aged people with MS more likely to be employed than either younger or older ones. Rumrill et al. (1998) presented similar findings in their employment concerns survey of people with MS in Ohio.

Two factors related to MS and unemployment might help to explain why seasoned workers tend to leave the workforce before reaching retirement age. First, there is a significant relationship between age and MS-related functional disability (Fraser et al. 2006); as the years pass and the illness progresses, the person becomes less able to meet the physical demands of employment. Second, age is positively associated with socioeconomic status; many older people with MS have the financial means to stop working and do so voluntarily to focus on other pursuits (Rumrill 2006).

30.3.2 Disease-Related Factors

Researchers have uncovered a large volume of evidence concerning the impact of the physiological symptoms of MS on employment (Rumrill et al. 2008). Several studies have revealed the exacerbation and progression of physical symptoms to be strong predictors of job loss. In denoting the most frequently cited reasons that people with MS leave the workforce, Rumrill (2006) and Fraser et al. (2002) noted that as many as 30 % of unemployed people with MS attribute their jobless status to the physiological effects of the illness, especially fatigue. Gulick et al. (1989) found mobility problems to be associated with unemployment in people with MS, as did Kornblith et al. (1986) and Rumrill et al. (1998). Nearly half of unemployed respondents in the survey of people with MS conducted by Edgley et al. (1991) cited ambulation difficulties as the primary reason for leaving the workforce. Thirty-nine percent described fatigue as the most important contributing factor.

In addition to the type of symptoms experienced by people with MS, numerous characteristics of the disease process have been linked to employment status. Roessler et al. (2004) found that people who experience MS symptoms most or all of the time, especially if the persistent symptoms were greater in number and more severe, are more likely to be unemployed than people with other symptom patterns. More symptoms, more persistent symptoms, and more severe symptoms are generally associated with primary or secondary progressive MS, so it follows that people with progressive forms of the disease are at greater risk for job loss than people whose MS experience is more episodic and/or less intrusive.

Cognitive deficits associated with MS are, arguably, the most frustrating aspect of the illness (Fraser et al. 2002, 2006; Kalb 2012; McReynolds and Koch 2001). By their own reports, employees with MS identified significant career maintenance barriers resulting from thought-processing and memory deficits in Roessler and Rumrill's (1995) needs assessment study. Roessler et al. (2004) found people with MS who reported cognitive impairments are four times more likely to be unemployed than people with MS who did not report cognitive impairments. Edgley et al. (1991) indicated that the frequency of perceived cognitive problems was directly related to the rate of unemployment among people with MS in Canada. Respondents who indicated that they rarely experienced cognitive problems reported an unemployment rate of 53 %, whereas the unemployment rates for people with MS who described the regularity of cognitive problems as sometimes (67 %), often (73 %), and almost always (86 %) were significantly higher.

Although MS is often accompanied by affective disorders and psychological problems, people with MS do not generally equate them with job loss (Rumrill et al. 2008). LaRocca et al. (1985) found that only 2.8 % of unemployed people with MS considered emotional difficulties to be the primary reason for their job loss. Edgley et al. (1991) also noted that self-reported emotional problems had a much smaller impact on employment status than did such factors as gender, age, and physiological symptoms.

30.3.3 Environmental and Workplace-Related Factors

Job satisfaction has been linked to job tenure and employment status in both the general population (Dawis and Lofquist 1984) and people with MS (Roessler and Rumrill 1995). Roessler and Rumrill (1995) found that many people with MS who were employed experienced high levels of dissatisfaction with their jobs. In general, employees with MS were not satisfied with (a) the amount of work that they were expected to do (too much), (b) the amount of pay that they received (too little), (c) their opportunities for advancement (too few), (d) the training that they received on the job (too little), and (e) the recognition afforded them for their work (too little).

Roessler and Rumrill (1995) also described job mastery problems as common impediments to career development for people with MS. They reported frequent job mastery concerns among employees with MS in response to such items as (a) considering what I will do in the future, (b) having a plan for where I want to be in my job in the future, and (c) believing that others think I do a good job. These findings suggest that the medical symptoms of MS and the unpredictable disease process make it extremely difficult to formulate and act upon long-term career plans.

Gulick et al. (1989) viewed the person-environment interaction as an essential consideration in evaluating the work performance of people with MS. Their qualitative study revealed that physical limitations, MS-related symptoms, and environmental factors were interrelated to job performance and, consequently, to job retention. The researchers emphasized the need to empower workers with MS to monitor the progression of their disease and request appropriate job modifications from their employers.

Another worksite factor that bears on a person's ability to retain employment while coping with MS is the reaction of his or her employer and coworkers. This is not to imply, however, that employer attitudes toward people with MS are always negative. Sumner (1997) reported that many employers have gone to great lengths to educate themselves about MS and to accommodate workers who are coping with the disease. He identified open communication and a willingness on the part of employees and employers to understand one another's concerns as the key ingredients to successful job retention and return to work for people with MS. Rumrill et al. (1997) connected the act of requesting on-the-job accommodations to self-efficacy, which has been associated with MS and employment status in several investigations (Fraser et al. 2006). Putting these findings together forges a direct link between environmental and personal factors related to the employment of people with MS: reactions of employers and coworkers influence the employee's willingness to ask for needed help on the job; willingness to ask for help influences self-efficacy, and vice versa; the reciprocal relationship between self-efficacy and willingness to ask for help influences the person's prospects for continued employment (Rumrill 1996).

Ketelaer et al. (1993) reported that people employed in the medical field and in jobs that required them to work out-of-doors, stand for long periods of time, and/or exert physical strength were far more likely to lose their jobs than were those working under other occupational conditions. Rumrill et al. (1999) found that well-educated, professional-level workers with MS had fewer employment problems and, consequently, more optimism about continued career success than did workers in other job categories.

Duggan et al. (1993) simply asked unemployed people with MS why they had left their jobs. Approximately 75 % reported stopping work voluntarily, but worksite barriers were frequently cited as reasons for that choice. These on-the-job obstacles included less-than-helpful employee assistance programs and a lack of reasonable accommodations. Many respondents believed that they could have benefited from such assistance as home-based work, education for their employers about MS, and individual employment counseling. A number of respondents also felt that information concerning the Americans with Disabilities Act (ADA), other legal protections, health insurance, and Social Security Disability Insurance would have helped them to retain employment. It is important to note that people with MS seldom attribute their all-too-frequent unemployment to issues of absenteeism, safety, or interpersonal conflicts with coworkers and supervisors (Rumrill et al. 2008). It should also be pointed out that people with MS often leave the workforce for non MS-related reasons. LaRocca et al. (1985) revealed that 37 % of unemployed people with MS had left their jobs due to pregnancy, marriage, relocation, or retirement.

Technically speaking, the choice to leave the workforce is most often made by the person with MS himself or herself, but it is not known to what extent the phenomenon of discrimination in the workplace "helps" people with MS to make that choice. What is known is that perceived discrimination is a major obstacle to continued employment following diagnosis with MS, and that people with MS often believe that their employers treat them unfairly in comparison to workers without disabilities. Indeed, Rumrill and Hennessey (2001) described workplace discrimination as the unifying feature of the employment experience for Americans with MS, suggesting that it is the number one explanation for the high rate of workforce attrition that follows the onset of the illness.

That assertion is upheld in empirical research findings. In the national survey conducted by Roessler et al. (2002), no fewer than six items related to implementation of the ADA and the Family and Medical Leave Act (FMLA) were reported among the 12 most prominent employment-related problems identified by Americans with MS. Specifically, the majority of respondents reported having been treated unfairly in the hiring process by employers (73 %), having been denied reasonable accommodations (58 %), having received lower pay compared to their peers that are without disabilities (53 %), being refused schedule modifications that would have enabled them to continue working (59 %), having received inadequate health insurance coverage (73 %), and having received little or no information about their legal rights from employers (69 %).

Between 1992 and 2003, the United States Equal Employment Opportunity Commission (EEOC) received and resolved 3669 allegations of employment discrimination from people with MS under Title I of the ADA (Rumrill et al. 2005). Allegations of unlawful termination constituted the most commonly cited form of workplace discrimination (29.9 %), followed in descending order by complaints related to reasonable accommodations (21.9 %), terms and conditions of employment (9.8 %), harassment (6.7 %), hiring (3.8 %), discipline (3.4 %), constructive discharge (i.e., creating a work environment that makes it impossible for the person to continue working (3.0 %), layoff (2.8 %), and promotion (2.5 %). People with MS filing ADA Title I allegations were mostly female (66.5 %), predominantly Caucasian (76.1 %), and of mid-career age on average ($M = 42.47$ years, $SD = 8.54$). Allegations were most often filed against employers in the South United States Census tracking region (35.7 %), and employers in the service, financial, insurance, and real estate industries were most often the subjects of ADA Title I complaints.

In comparison to ADA Title I complainants with other disabilities, people with MS were more likely than people with other disabilities to allege discrimination under Title I of the ADA in the areas of reasonable accommodations, terms and conditions of employment, constructive discharge, and demotion; less likely to allege discrimination in the area of hiring; and more likely to have their allegations of discrimination resolved in their favor by the EEOC (Unger et al. 2004).

The problem of workplace discrimination was further underscored in several focus groups of people with MS conducted by Roessler et al. (2003). Focus group members identified discrimination and unfair treatment at work as one of the top agenda items for improving the rate of labor force participation among people with MS. Similarly, 38 % of callers into Kent State University's MS Employment Assistance Service hotline since 1999 have sought assistance with interpreting their legal rights and/or redressing employer discrimination (Rumrill et al. 2008).

It is well documented that people with MS who receive disability benefits from private insurers or from government agencies face extreme difficulties in restarting their careers. Indeed, the benefits paid by most long-term disability insurance carriers and the Social Security Administration's two disability programs (i.e., Social Security Disability Insurance [SSDI] and Supplemental Security Income [SSI]) are predicated on the beneficiary being too disabled to work (Marini 2003). This requirement provides a powerful systemic disincentive that keeps thousands of Americans with MS from participating in the labor force. Once they have been adjudicated as too severely disabled to work by either long-term disability insurers or Social Security (or sometimes both), they integrate the external confirmation of their disabled status into their own self-concepts—self-concepts that do not necessarily include the role of worker (Roessler and Rumrill 2003). From that point on in the vast majority of cases, unemployment and receipt of disability benefits conjoin in a self-fulfilling prophecy for people with MS. According to Fraser et al. (2004) people with MS progress from active employment to short-term disability insurance, long-term disability insurance, and, finally, SSDI at higher and faster rates than people with most other disabilities. Once on SSDI, the "too disabled to work" message has already registered loud and clear, and over time it would seem to become impervious to alternative messages of employability. According to Fraser et al. (2002), less than 1 % of Americans with MS who receive SSDI benefits will ever resume gainful employment.

30.4 Return to Work and Job Retention Interventions

Over the past 30 years, there have been numerous resources, demonstration projects, research studies, direct services, and advocacy efforts to promote the employment and career advancement of people with MS and other disabling conditions. Some of these interventions are designed specifically for people with MS, and others target people with all types of disabilities. Some of these interventions are delivered by rehabilitation professionals, and others are of the "self-help" variety. Some of these interventions are delivered in-person, and others can be accessed via telephone or the Internet. Some of these interventions focus on job acquisition (i.e., getting a job), and others focus on return to work (i.e., reentering the workforce) or job retention (i.e., keeping and advancing in the job one has).

As different as these programs and projects are in design and implementation, together they form a powerful set of tools and strategies for combating the deleterious impact that MS too often exacts on a person's employment status. Because almost all people with MS have employment histories, the interventions and programs described in this section are framed within a return to work and/or job retention context.

30.4.1 Multiple Sclerosis: Specific Interventions, Programs, and Strategies

Rehabilitation professionals who aid people with MS in continuing or resuming their careers will be well served to familiarize themselves with past and present initiatives designed specifically for people with MS. For example, since 1999, the Center for Disability Studies at Kent State University in Ohio has offered employment assistance and career counseling services to adults with MS (Rumrill 2006). The MS Employment Assistance Service is staffed by nationally Certified Rehabilitation Counselors who provide a wide range of vocational services, including the following:

- Career Counseling
- Return to Work Assessment and Consultation
- Assessments of Vocational Interests and Aptitudes
- Transferable Skills Analysis
- Resume Preparation
- Interview Skills Training
- Targeted Job Placement Assistance
- Social Security Advocacy
- Self-advocacy Training
- Benefits Planning
- Referrals to Legal Resources
- On-the-Job Accommodation Planning
- Consultation in Employment Litigation

All services are provided via telephone or e-mail, and each participant develops a customized plan of services and assistance from the "menu" described above. Some participants use the MS Employment Assistance Service over an extended time period, whereas others call or e-mail for specific, point-in-time answers to employment-related questions and concerns. The service is supported by subscriptions from individual chapters of the National Multiple Sclerosis Society, and it has served more than 2700 people with MS during its 13 years of operation.

Founded in 1980 as a job readiness and return to work training program, Operation Job Match (OJM) was the employment assistance and support program of the National Capital Chapter of the National Multiple Sclerosis Society in Washington, DC. As a multi-week employment group, the program addressed a variety of employment and disability-related issues including job-seeking skills components and a selective placement component. Topics included disability management, stress management, assertiveness training, disclosure issues, accommodation strategies, interview skills, resume and cover letters, and networking. OJM maintained a job bank of positions available in the metropolitan Washington, DC area and staff then matched program participants to available positions. Job bank participants were private sector employers, federal government agencies, colleges and universities, and nonprofit organizations. Though originally designed for individuals with MS, the program was expanded to include participants with other adult-onset physical disabilities such as lupus, arthritis, diabetes, and spinal cord injury (LaRocca and Hall 1990).

Operation Job Match increased the return to work proficiency of participants by enlisting assistance from the employer community to generate a wide range of career options. The initial program proved to be so successful that it has been replicated at National Multiple Sclerosis Society chapters throughout the United States.

In 1983, the National Multiple Sclerosis Society, in conjunction with the Arthritis Foundation and a consortium of traumatic brain injury advocacy groups, developed the Job Raising Program. The Job Raising Program represented an employment placement and retention model for people with adult-onset, chronic disabilities. Over an 8-year period, the Job Raising Program assisted a total of 2338 participants in obtaining and/or maintaining employment. A wide variety of services were provided in a 10-week, small-group (10 to 12 participants) format. Participants received training from community experts on assertiveness, interviewing, resume writing, and labor market trends. Upon completion of the training component, Job Raising participants formed a job search club to provide ongoing support for one another. Job seekers were also introduced to mentors who worked in their chosen fields.

Job Raising proved to be a highly successful program, with 60 % of all participants (i.e., people with MS, arthritis, and traumatic brain injury) successfully employed at the 8-year follow-up (Hall 1991). Job Raising participants with MS fared even better than their counterparts with arthritis or brain injuries; 71 % of these individuals reported being employed at follow-up.

The Career Possibilities Project (Rumrill et al. 2008) addressed LaRocca's (1995) call for empowerment, civil rights awareness, resource utilization, and community-based services as research priorities concerning the employment of people with MS. Targeting unemployed people with MS in four midwestern cities, the project was designed to increase participants' employment rate, job-seeking activity, employability maturity, optimism about re-entering the workforce, and career self-efficacy.

Utilizing a two-group, pretest/posttest quasi-experimental design, Rumrill et al. (2008) recruited 37 participants from National Multiple Sclerosis Society chapters and MS clinics in the target cities (i.e., Cleveland, OH; Evansville, IN; Louisville, KY; and Milwaukee, WI). Time sampling methods were used to assign the first 23 participants to the Career Possibilities condition and the second 14 participants to the comparison group. Participants in the comparison group completed a telephone interview with a trained rehabilitation professional about their return to work plans. They also received a job-seeking information packet that contained tips and strategies for securing job leads, developing resumes, interviewing, following up after interviews, and networking. The more elaborate Career Possibilities condition included the telephone interview and the Accommodations Planning Team (APT) seminar, which introduced participants to employers in their chosen fields and rehabilitation professionals who could help facilitate the career re-entry process. The APT is a half-day program that teaches skills related to (a) identifying prospective accommodation needs, (b) understanding one's legal rights to reasonable accommodations, (c) discussing accommodation needs with employers, and (d) developing resource-directed plans for obtaining career entry or re-entry positions (Rumrill 1996).

Results of the Career Possibilities Project revealed that the APT seminar and the less elaborate return to work counseling condition (administered to the comparison group) were similarly effective in helping people with MS return to work. From a baseline employment rate of zero, 30 % ($n=7$) of participants in the APT seminar reported being employed at a 16-week follow-up. Twenty-nine percent ($n=4$) of the comparison group were also employed at the 4-month checkpoint—thereby supporting Roessler's (1996) "least intervention" assertion that unemployed people with MS may need only limited, but focused, assistance to re-enter the workforce. Overall, the Career Possibilities Project successfully re-employed 11 people with MS who had disengaged from the workforce. With a total budget of $20,000, this project achieved those return to work re-entry outcomes at a very cost-effective rate of $1818 per placement.

In 1992, the National Multiple Sclerosis Society introduced Project Alliance, a comprehensive job retention program that combined needs assessment principles and self-advocacy training with employer consultation and community resources. The Project Alliance intervention was made available to employed persons with MS and other adult-onset chronic illnesses at 14 sites nationwide. The 3-year initiative served more than 300 employees and their employers. The primary objectives of this innovative program were:

1. To engage both the employee (with a chronic illness) and the employer in the process of examining the current issues related to job performance.
2. To gather information related to the person's actual position, including the physical and cognitive requirements, the essential and marginal functions, and support systems.
3. To identify barriers to successful job performance.
4. To provide assistance to the employee and the employer in improving communication and in moving toward satisfactory resolution of work-related issues.
5. To assist all parties in understanding the provisions of the ADA and how voluntary compliance can benefit all concerned.
6. To help identify needs of the employee and employer in terms of job modifications, adjustments, or accommodations that could assist the employee in achieving and maintaining satisfactory work performance (Sumner 1997, p. 1).

Project Alliance objectives were achieved by conducting an on-site job analysis that utilized input from the rehabilitation professional, the employee, the employer, and coworkers. The job analyst recorded and interpreted information pertaining to the essential and marginal functions of the position, the employee's general and illness-related health status, the impact of the illness on the employee's job performance, the quality and quantity of the employee's work in comparison to coworkers, on-the-job and community resources that could be consulted, and employee and employer appraisals of the presenting problem(s) (Sumner 1997). The job analyst then synthesized the information into a written report that was presented to both the employee and employer. Finally, follow-along contacts were made to assist in the implementation and monitoring of reasonable accommodations and other job retention strategies.

Because Project Alliance required the employee with MS (or other chronic illness) and his or her employer to work together in the process of identifying, prioritizing, and implementing reasonable accommodations, it exemplified the ADA's spirit of collaborative decision making and non-adversarial problem solving. The project also educated employers about the value of retaining experienced and productive employees who may be coping with disabilities but who can still "get the job done."

An important consideration in any return to work or job retention initiative for people with MS is the person's employment history, and it is likely that most people with MS will seek to either resume or continue working in their usual and customary occupations. Within a subsample of successfully employed workers with MS, Kraft et al. (1986) noted that the vast majority were employed in the same jobs they had held at the time of diagnosis, and that very few had changed jobs since the onset of their illness. More recently, Rumrill (2006) asserted that the onset of MS has no effect on a person's vocational interests; it can and does, however, affect a person's ability to continue in his or her chosen field. These findings indicate that return to work and job retention services should be introduced immediately after diagnosis while the person's identity as a worker is still strong.

In 2004, the National Multiple Sclerosis Society produced a comprehensive employment program, *Career Crossroads*: *Employment and MS*, geared primarily toward individuals who are currently working and hoping to retain employment. This program consists of a video/DVD, accompanying participant manual and group leader manual. The program is designed to be implemented in a small-group setting over several weeks. In the video, a fictional character, Claire, is struggling with challenging symptoms that are beginning to affect her job performance as a graphic designer. She has been recently diagnosed but has neither disclosed her MS nor requested any accommodations. Her friend, fictional character Vanessa, who is a librarian, assists Claire with researching the appropriate steps to request accommodations and tap into available resources in order to maintain her employment. In the video, actual people with MS, rehabilitation professionals, attorneys, employers, and medical professionals are interviewed for their perspectives on Claire's case. Topics covered in *Career Crossroads* include the following:

- The importance of work;
- The impact work has on MS and the impact MS has on work;
- Legal protections—ADA, FMLA, Health Insurance Portability and Accountability Act (HIPAA), and Consolidated Omnibus Budget Reconciliation Act (COBRA);
- Disclosure—including a disclosure script "formula" and a description of the advantages and disadvantages of disclosing illness;
- Accommodations—practical strategies for managing symptoms in the workplace and requesting accommodations;
- Resources—including the National Multiple Sclerosis Society, Job Accommodation Network (JAN), United States EEOC, Disability and Business Technical Assistance Centers (DBTACs);
- Information on tax incentives for hiring people with disabilities;
- Work-life balance and planning ahead.

In 2007, the National Multiple Sclerosis Society released a DVD entitled *MS in the Workplace*: *A Guide for Employers*. This video is geared toward employer representatives—human resource professionals, recruiters, diversity outreach professionals, and supervisors and coworkers of people with MS. The underlying message is that hiring and retaining people with MS makes good business sense—and that it would be a disservice to ignore the talents and contributions that people with MS and other disabling conditions can bring to the workplace. The video features employees with MS and employers discussing the importance of having a diverse workforce.

MS in the Workplace: *A Guide for Employers* contains information regarding some of the key components of the employment section of the ADA, namely essential functions of the job and reasonable accommodations; issues surrounding disclosure; and examples of accommodation strategies and information regarding costs, including the fact that work accommodations may cost nothing or very little to implement. Employers, employees with MS, and rehabilitation professionals are featured throughout the 12-min DVD, along with national level resources.

Another return to work and job retention strategy for people with MS is home-based employment. Once viewed by vocational rehabilitation professionals as a demeaning concept because it was thought to exclude people with disabilities from working in integrated job settings, home-based employment is a burgeoning area of growth in the general labor market. Thanks to the now common practice of telecommuting, the number of Americans who work primarily at home has more than tripled since 1993 (Fraser et al. 2006). Estimates are that as many as 40 % of all American workers currently work at home for at least part of the time. In the current economy, home-based employment provides what is fast becoming a normative work opportunity for people with disabilities, and people with MS are often excellent candidates for these jobs.

The University of Washington Medical Center operates a home-based jobs program for people with MS and other neurological disorders (e.g., epilepsy, traumatic brain injury). Fraser et al. (2006) noted that interest among people with MS in arranging home-based work opportunities is exceeded only by demand from Seattle-area employers for qualified home-based workers. They reported that people with MS are ideal candidates for home-based employment because they are experienced workers, and because they typically have well developed social networks outside of the work environment. This means that they are usually not dependent upon work for their primary means of socialization, and that the convenience of working at home frequently outweighs the lack of personal contact with coworkers. Sectors of the economy that Fraser et al. (2006) identified as being particularly fertile for home-based employment include computer software and other technologies, finance and investment brokerage, information processing, and insurance.

30.4.2 Cross-Disability Employment Programs That Can Assist People with Multiple Sclerosis in Returning to Work

Within each state, there is an agency that provides comprehensive vocational rehabilitation (VR) services to individuals with disabilities. This agency may have slightly different names in each state and may offer slightly different services, but each one is part of a program that was established by the Rehabilitation Act of 1973 (Fraser et al. 2006). The VR program combines federal and state funds and, though federally mandated, is carried out by individual state agencies. VR services are administered in an eligibility program rather than an entitlement program. This means that one must demonstrate eligibility for VR services by having a physical or mental impairment that results in a substantial barrier employment. There must be a reasonable expectation that vocational rehabilitation services can help the individual to gain or maintain employment. Many state agencies work under an "Order of Selection" mandate, which means that services are prioritized for individuals with the most significant disabilities. Services that may be provided through the state VR program include the following:

- Vocational evaluation and assessment to determine skills, abilities, interests, and the impact of symptoms on employment;
- Specialized assessments addressing computer/assistive technology needs;
- Vocational guidance and counseling;
- Medical appliances and prosthetic devices, if needed, to increase the individual's ability to work;
- Vocational training and education;
- Occupational tools and equipment;
- Job development and placement services;
- Follow-along services;
- Post-employment services.

The Disability and Business Technical Assistance Centers (DBTACs), also known as the ADA National Network, were established by the National Institute on Disability and Rehabilitation Research (NIDRR) to provide information, training, and technical assistance to employers, people with disabilities, and other entities with responsibilities under the ADA (Fraser et al. 2006). There are ten regional ADA Centers throughout the United States. Although the regional centers may vary somewhat, all centers provide the following:

- Technical Assistance;
- Education and Training;
- Materials Dissemination;
- Information and Referral;
- Public Awareness;
- Local Capacity Building.

Information and assistance are available on issues regarding the various titles or sections of the ADA including employment, public accommodations, public services, and communications. Centers may also be able to address other key legislation including the FMLA and the Rehabilitation Act of 1973.

The Job Accommodation Network (JAN) is a free service of the United States Department of Labor Office of Disability Employment Policy (ODEP). JAN's mission is to facilitate the employment and retention of workers with disabilities by providing employers, employment service providers, people with disabilities, their family members, and other interested parties with information on job accommodations, assistive technology, and self-employment and small business opportunities (Fraser et al. 2006). JAN has been in continuous operation at West

Virginia University since 1984. JAN consultants can help employers to determine appropriate accommodations for employees, gain a better understanding of their responsibilities under the ADA and Rehabilitation Act, and obtain answers to accessibility questions. For employees and people with disabilities, JAN consultants can help brainstorm accommodation strategies given particular symptoms and job duties, educate individuals about their rights and responsibilities under the ADA and other disability legislation, address the connection between disclosure and the proper way of requesting accommodations, and provide contact information for state government vocational rehabilitation and community agencies. JAN also makes its services available to rehabilitation professionals.

30.5 Best Practices in Return to Work and Job Retention for People with Multiple Sclerosis

The interventions and programs described in the preceding sections share some common elements that should be viewed as best practices for professionals in the interdisciplinary endeavor of return to work. Career re-entry and job retention efforts for people with MS should include the following considerations:

- Comprehensive assessment of the worker's general and MS-related health status;
- Contingency planning for changes in the worker's symptoms and/or progression of MS;
- Monitoring the worker's health status and treatment regimens;
- Analysis of the worker's disability benefits and how they may be affected by returning to work;
- Consideration of the worker's transportation needs;
- Strategies for disclosing medical information;
- Assessment of the worker's needs for reasonable accommodations;
- Self-advocacy strategies for requesting on-the-job accommodations;
- Consultation with employers to facilitate the worker's safe and successful return to work;
- Referrals to resources such as the state Vocational Rehabilitation program, the Job Accommodation Network, and the National ADA Network;
- Collaboration with MS advocacy organizations such as the National Multiple Sclerosis Society and the Multiple Sclerosis Foundation;
- Consideration of the impact of returning to work on the worker's family.

30.6 Conclusion

With its initial onset occurring during the prime years of career development, the wide range of physiological and neurological symptoms, and the unpredictable, sometimes progressive disease process, Multiple Sclerosis poses significant return to work and job retention challenges. The early stages of coping with MS often find people making significant changes in their daily routines and activities, and remunerative employment is an all-too-frequent casualty of this highly intrusive disease. Although most people with MS have employment histories and were working at the time of diagnosis, only a small percentage can currently expect to continue working until retirement age.

Return to work efforts on behalf of people with MS must focus on maintaining one's health and managing symptoms, identifying disability-related barriers to successful employment, implementing on-the-job accommodations, and availing the worker of his or her legal protections under laws such as the Americans with Disabilities Act and the Family and Medical Leave Act. By understanding the medical and psychosocial aspects of MS, the factors associated with employment status among people with MS, and existing programs and resources that can help people with MS in re-entering or retaining employment, rehabilitation and health professionals can implement effective and responsive return to work services that will improve employment outcomes for this experienced and well-trained group of workers.

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Return to Work in Mild Cognitive Disorders

31

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31.1 Introduction

Even in the absence of illness or injury, cognitive ability fluctuates significantly from day to day or moment to moment. Many of us regularly work to maximize our available cognitive resources for certain tasks, or modify our activities to accommodate fluctuations in cognitive status. For example, we may drink a cup of coffee before a mentally challenging activity, or avoid challenging activities when we are feeling mentally drained. These normal cognitive fluctuations are subtle by comparison to the cognitive impairments associated with serious neurological illnesses, yet they can still manage to affect our work. Therefore, it is no surprise that even mild cognitive impairments due to illness or injury can also significantly impact work performance when they persist over time. Previous research across patient groups and healthy individuals has identified robust links between cognitive abilities and real-world functional performance (Bell-McGinty et al. 2002; Benedictus et al. 2010; Cifu et al. 1997; Cullen and Weisz 2011; Kalechstein et al. 2003; Ross et al. 1997; Royall et al. 2005).

Beyond regular day-to-day fluctuations in cognitive efficiency, many individuals experience more persistent mild cognitive impairments at some point in their lives. In some cases, these changes represent a decline from previous levels of cognition due to an identifiable event, such as a traumatic brain injury sustained in a motor vehicle accident. In other cases, these changes may occur slowly over time, such as progressive neurodegeneration occurring due to age-related illness or HIV infection. Still others may experience subtle cognitive impairments that have been present in one form or another since childhood, such as attention-deficit/hyperactivity disorder (ADHD). Although each of these mild cognitive impairments can cause disruptions in occupational functioning, most individuals with these conditions will have the desire and the capability to continue working or to return to work after a period of recovery.

For many individuals, one of the primary challenges of having mild cognitive impairment is its

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"invisibility." Individuals with more severe cognitive impairments often present with signs of disability that are more obvious to the casual observer, such as altered speech or difficulty with coordinated movement. By contrast, mild cognitive impairments may fall closer to the range of "normal" experience: disorganization, difficulty remembering a name or a word, problems multitasking, feeling slowed down, or reduced ability to handle frustration. However, unlike the typical person who experiences only transient cognitive underperformance, those with persisting mild cognitive disorders cannot simply defer important activities until they are feeling "back to normal." Unfortunately, without awareness and appreciation of an individual's mild cognitive impairments, many coworkers or supervisors (or even the patients themselves) may hold the expectation that the affected individual should simply "snap out of it."

Difficulty in recognizing mild cognitive impairments is not restricted to the lay public. Health care providers, including specialists in neural or behavioral functioning, may also overlook subtle cognitive problems in their patients. For example, problems with memory or concentration that may seem obvious to the patient might not be detected on gross cognitive exams. Sometimes, discrepancies between clinical findings and the patients' experiences may represent limitations in the sensitivity of exams or the tests themselves. At other times, patients' subjective experiences and the results of objective tests of cognitive performance may simply reflect two different, but equally important, perspectives on functioning. For example, an individual might notice that high levels of cognitive effort were required to complete a task, without noticing that their performance on that task remained solid. Alternately, non-neurological factors such as depression and anxiety can impact an individual's self-evaluation and subjective impression of their skills and abilities. Ultimately, it is important to consider both subjective and objective cognitive ability in identifying the best ways to maximize successful return to work.

In this chapter, we will review major types (domains) of cognitive impairment, a number of common causes of mild cognitive impairment, ways in which these conditions may affect occupational functioning, and best practices to assist individuals with these conditions in successfully returning to work or improving workplace functioning. We will also discuss important gaps in our scientific knowledge about mild cognitive impairments and return to work, and future developments that may be important in filling these gaps and improving care for these patients. Following discussion of specific conditions, we will then attempt to provide some guidelines for addressing the effects of mild cognitive impairment on occupational functioning that can be useful across a range of conditions and contexts.

31.2 Types of Cognitive Impairment

As discussed above, patients with mild cognitive difficulties may feel that their thinking abilities are less efficient than they once were or relative to the experience of their peers. The types of mild difficulties seen tend to cluster into categories.

A common form of mild cognitive dysfunction is **slowed processing speed**. This means that it takes longer to deal with incoming information and respond to the environment. For example, an individual may find that it takes longer to read and comprehend a book passage than before. Others may feel as though they have a difficulty keeping up with a conversation. In general, there is a sense that it takes longer to do things. Often, slowed information processing speed is accompanied by slower psychomotor speed, e.g., a reduced rate of speed in coordinating body movements.

Patients may also experience difficulties with **attention or concentration**. It may be difficult to focus on one task for a long period of time. For example, someone may find it more difficult to read a book chapter without frequent breaks. Another person may find that they have more difficulty "tuning out" distractions in the environment, such as ignoring a ringing phone when working on a report. Other individuals may experience *inattention*, whereby they are prone to missing information of interest. For example, they may not detect spelling errors in a memo or they may fail to notice a defect in a product they are examining. A more complex form of attention is called *working memory*, which involves holding and manipulating information in mind in order to apply it to ongoing activities (e.g., keeping a phone number in mind for a few seconds to dial it). Similarly, a person may experience difficulty with *multitasking*. As a result, he or she may find it impossible to pick up where he or she left off on a report after responding to an email.

Many patients with mild cognitive disorders experience problems with **memory**. Most commonly, patients may have a difficult time with *free recall* of important information, but they can remember the information much better when cues or reminders are present. For example, an individual may forget that a manager told her to file a quarterly report, but upon seeing a stack of papers related to the report, she remembers the original instruction. Some other patients may have difficulties in the actual *encoding* and *storage* of new information. For an individual who has this form of memory difficulty, seeing the stack of papers will unfortunately not serve as a reminder because either they were not attending well enough to process the instructions in the first place or the individual no longer has any memory of that request.

A group of higher-order cognitive abilities termed **executive functions** coordinate other cognitive functions in order to problem solve and perform goal-directed behaviors. Some executive functions that are commonly affected among those with mild cognitive disorders are *organization* and *planning*. For example, when faced with a complex task, an individual may have a difficult time coming up with a plan of action. Balancing an expense report may be difficult because an individual has a hard time deciding where to begin, and in what order to complete the necessary steps. The person may have no problem accomplishing each of the individual subtasks, but still have a hard time structuring and sequencing the overall activity to achieve the goal. Executive functioning also includes more motivational aspects of behavior, or the ability to follow through with a plan. For example, a patient who to have difficulties with *initiation* may know how to complete the expense report, but still have a difficult time getting started. Once started, he or she can complete it. Another important element of executive functions is that they enable someone to behave in a way that is appropriate to a specific environment or context. For example, some individuals experience difficulties with *inhibition* or *impulsivity*, whereby they may make mistakes by acting prematurely, before thinking their actions through. Being able to use cues in the environment and *shift* one's behavior to a more appropriate response is key to flexibility and adaptation. In addition to affecting basic work performance, some forms of executive dysfunction may take the form of socially inappropriate behavior that can affect workplace relationships.

Many of these cognitive difficulties tend to overlap, in that most individuals with mild cognitive dysfunction will have multiple subtle problems rather than a single glaring deficit. Additionally, it is important to keep in mind that different people may describe their cognitive difficulties in different ways. For example, it is not uncommon for patients to experience attention problems as memory problems. Going back to the example in which an employee has forgotten to file a quarterly report, it may have been that the employee was distracted when the request was given, perhaps thinking about other important activities, or listening to another conversation. In this case, the person does not have a "memory" difficulty per se, but has a hard time focusing on important information. These different causes of problems can be difficult to distinguish without careful evaluation by a health care provider who is experienced with mild cognitive disorders.

Finally, it is also common for patients with mild cognitive difficulties to experience **emotional symptoms** such as feelings of depression or anxiety. They may feel frustrated that things that used to be very simple appear harder, or take longer. These feelings may exacerbate mild cognitive difficulties by serving as an additional source of distraction from workplace or personal activities. Alternatively, negative emotions may also make it difficult for a patient to feel accomplished, motivated, and productive.

31.3 Attention-Deficit/Hyperactivity Disorder

31.3.1 ADHD: An Overview

Attention-deficit/hyperactivity disorder (ADHD) was initially characterized as a childhood disorder. However, over the past few decades, research has clearly demonstrated that ADHD symptoms and associated impairment often persist into adulthood (Barkley et al. 2002a, b; Faraone et al. 2006; Kessler et al. 2006). Studies suggest that ADHD symptoms continue to affect a significant minority of the adult population, with workplace studies placing the rates of adult ADHD at about 4.2 % in the United States (Kessler et al. 2005) and about 3.5 % internationally (de Graaf et al. 2008). These surveys suggest that a substantial proportion of American workers are experiencing difficulties due to ADHD. When additionally considering the fact that leading ADHD researchers have considered diagnostic practices to be excessively stringent and inappropriate for adults, thus underestimating true rates of the disorder in adulthood (Barkley et al. 2010), the potential for ADHD to disrupt general workplace productivity becomes a significant concern for both employees and employers. Perhaps due the scale of this problem, a substantially larger amount of research attention has been directed toward improved understanding of ADHD in the workplace than to other mild cognitive disorders. However, fewer studies have assessed effective interventions, an area of investigation that continues to grow but currently relies largely on clinical observations and experience.

ADHD can be considered a disorder of self-regulation (Barkley et al. 2010). Current diagnostic criteria for ADHD include two separate symptom domains: one that predominantly reflects inattention and the other involving symptoms of hyperactivity and impulsivity (APA 2013). Individuals may meet criteria for ADHD based on impairment related to having a specific number of symptoms within either of these individual domains (predominantly inattentive or predominantly hyperactive-impulsive presentation) or due to a combination of symptoms from both domains (combined presentation). A childhood onset of symptoms is required for an ADHD diagnosis, but the specific manifestation of ADHD symptoms tends to change over the lifespan. Specifically, the motor overactivity that is commonly identified as problematic in children becomes less salient (Hart et al. 1995; Stavro et al. 2007), and adults are more likely to have problems with inattention-disorganization and impulsivity (Barkley et al. 2010). The predominantly inattentive-disorganized presentation of the disorder may be less apparent to others and more easily overlooked in childhood as well as adulthood because it causes less disruption in classrooms, workplaces, and other environments. The transition of ADHD to a seemingly more "benign" presentation may have contributed to the prior erroneous assumptions that children grew out of the disorder. However, studies have shown that inattentive-disorganized symptoms are associated with general impairment in adulthood (Stavro et al. 2007) and occupational disability (Gjervan et al. 2012). Thus, while adults with ADHD are less likely to behave in an apparently disordered manner, the ultimate effects are no less impairing on an individual level.

Impaired self-regulation in ADHD is predominantly associated with deficits in executive functioning (Antshel et al. 2010; Biederman et al. 2007; Brown et al. 2009; Hervey et al. 2004; Makris et al. 2008). Executive functions are higher-order cognitive abilities that are required for appropriate, effective, goal-directed activity. Deficits in various executive processes appear to underlie the behavioral dysregulation that impedes effective daily functioning in individuals with ADHD. Specifically, adults with ADHD often have difficulty resisting distraction, sustaining attention and focus to persist at a task, and inhibiting inappropriate behaviors or responses that lead to impulsive comments and poor delay of gratification (Barkley 2010). They often have difficulty holding and maintaining information in mind (i.e., poor working memory), affecting their ability to visualize past experiences or consequences that could inform present behavior, or stay focused on desired future goals and outcomes (Barkley 2010). As a result, adults with ADHD are easily sidetracked and often forgetful. They repeatedly overlook activities they "intended to do" and leave tasks incomplete. Limitations in self-control, planning, organization, and time management can contribute to the seemingly oppositional presentations of idleness versus frantic rushing to complete a procrastinated or forgotten assignment. As a result of these issues, adults with ADHD often struggle to meet commitments, display inconsistencies in school and work performance, suffer from impatience and mood swings, and experience conflict in social relationships and marriage (Murphy 2005). To others, individuals with ADHD can appear irresponsible or "lazy," but in actuality they often feel demoralized and frustrated about their ineffectiveness (Murphy 2005), which can exacerbate the difficulties already present from core ADHD symptoms. Comorbid conditions that are often associated with ADHD include depression, anxiety, disruptive behavior and substance use disorders, and learning disabilities (Biederman et al. 1993; McGough et al. 2005; Torgersen et al. 2006; Wilens and Dodson 2004). The psychosocial stresses and comorbid conditions associated with ADHD have the potential to complicate treatment and worsen outcomes.

Many job demands in the modern work environment may be particularly poorly suited for individuals with ADHD. For example, jobs involving sedentary work require task persistence for extended periods of time as well as independent initiation, organization, and prioritization of work responsibilities. This work structure creates opportunities for boredom and lack of productivity, particularly given the multiple potential sources of distraction and overstimulation such as access to email and the internet. Additionally, jobs that lack flexibility or include demands for constant output may make it difficult to modify or control the workflow to make it more manageable and tailored to the needs of an individual with ADHD.

31.3.2 Effects of ADHD on Workplace Functioning

Research has clearly demonstrated that ADHD is associated with occupational impairments. Adults with ADHD are more likely to be unemployed or underemployed (Barkley et al. 2010; Gjervan et al. 2012; Halmøy et al. 2009). They report employment instability, with shorter employment duration (Barkley et al. 1996b) and frequent job changes due to increased likelihood to impulsively quit their jobs as well as to be terminated involuntarily (Murphy and Barkley 1996). They report more behavioral problems and difficulty getting along with coworkers (Barkley et al. 2010). Employees with ADHD self-report poorer work quality, which is consistent with employers' lower ratings of work performance (Barkley 2002; Barkley et al. 2010). Self-reports and others' observations during a simulated workplace experience for non-medicated adults with ADHD revealed worse overall behavior ratings (Biederman et al. 2005). On the job, ADHD and its comorbid conditions increase risk of being injured or involved in an accident (Kessler et al. 2009; Swensen et al. 2004). Adults with ADHD tend to work in lower-level positions (Breslin and Pole 2009; de Graaf et al. 2008), and the adverse impact of ADHD upon work performance may be greater for blue collar workers than for professionals, perhaps due to the greater flexibility often inherent to professional positions (Kessler et al. 2005). Work impairments are directly related to features of ADHD, including severity of symptoms (Safren et al. 2010a, b) and deficits in executive functions (Barkley and Fischer 2011; Barkley and Murphy 2010).

In the workplace, ADHD impacts employees with ADHD as well as their coworkers and employers. On an individual level, ADHD is associated with 35 or more days of annual lost work (de Graaf et al. 2008; Kessler et al. 2005). Startlingly, this represents 120–143 million days of lost productivity each year nationally and internationally (de Graaf et al. 2008; Kessler et al. 2005). While this lost productivity includes more days off of work (absenteeism) (Secnik et al. 2005), reduced quantity and quality of work performance on the job (presenteeism) appears to represent the greatest loss of productivity within this group (de Graaf et al. 2008; Kessler et al. 2005, 2009), making it more difficult for employers to identify and address the issue. There are personal implications as well. For the worker with ADHD, the disorder may reduce an individual's income by an average of about $10,000 per year (Biederman and Faraone 2006). The income loss is greatest amongst workers with advanced degrees, perhaps because they have greater prospects for advancement. Further, because the occupational underattainment in adults with ADHD is due to performing below expectations rather than low educational level or intellectual abilities (Biederman et al. 2008), the discrepancy between potential and actual outcome can translate into feelings of demoralization and disappointment. Coworkers also experience frustration about their inability to rely on these individuals. Thus, ADHD can affect occupational success at multiple levels, from individual to workforce productivity, disrupting personal and financial achievement.

31.3.3 Enhancing Workplace Functioning in ADHD

31.3.3.1 ADHD Assessment

Clearly, the potential costs of ADHD in the workplace are quite high, emphasizing the need for appropriate intervention. However, most workplace prevalence studies found that only a small minority of individuals with ADHD were receiving any treatment (de Graaf et al. 2008; Kessler et al. 2009), reflecting the general population estimate that 10 % of adults with ADHD are undergoing treatment (Kessler et al. 2006). The first step in addressing ADHD is obtaining an accurate diagnosis if that has not already occurred. Individuals who are concerned about their work performance may benefit from screenings with employee services or other confidential occupational services if available prior to undertaking a more comprehensive, and expensive, assessment for ADHD with an appropriate provider. Psychologists and psychiatrists who have expertise in ADHD are best suited to perform these comprehensive evaluations, which ideally involve extensive interviews and evaluations to obtain self- and informant-reports on childhood and adult history and ADHD symptoms. Many symptoms seen in ADHD are not entirely unique to this disorder. Thus, careful consideration of alternate possible causes of symptoms and impairment is imperative to ensuring accurate diagnosis and effective treatment pathways. Additionally, understanding individuals' specific cognitive-executive deficits can help to delineate appropriate treatments. Behavioral ratings of executive function deficits have been shown to be associated with ADHD and work impairments, and may be more sensitive than formal clinical tests (Barkley and Fischer 2011; Barkley and Murphy 2010). Neuropsychological assessment is not required for diagnosis of ADHD, but can assist with the identification of learning disabilities as well as characterize an individual's cognitive strengths, weaknesses, problem-solving approaches, and relevant psychological factors in order to develop more targeted and individualized interventions. Following an accurate assessment and diagnosis, there are a variety of considerations for effectively managing ADHD symptoms in the workplace.

31.3.3.2 Job Selection

It is imperative to achieve a high level of "goodness of fit" in vocational pursuits in order to avoid the pitfalls that may lead to boredom, inefficiency, and ultimately job failure (Murphy 2005; Nadeau 2005). For individuals with ADHD in particular, finding a job that is interesting and stimulating is absolutely essential to maintain motivation (Barkley 2010; Nadeau 1997). Career counseling can be very helpful in identifying a good match to individual interests. Additionally, while the right job will undoubtedly vary from individual to individual based on personality traits and personal interests, there are some job characteristics that may better suit adults with ADHD in general. Generally, most adults with ADHD will manage best in an environment that provides some flexibility within the context of a clear structure and set of rules to follow (Barkley 2010). Clinical observations (Barkley 2010; Murphy 2005; Nadeau 1997) and results of a simulated workplace experience (Delisle and Braun 2011) have suggested that adults with ADHD perform best in occupations that have constant action demands rather than understimulating or repetitive work. The externally generated cues of a more lively setting can provide much-needed stimulation and also help to structure one's activities, thus reducing the need to organize and initiate activities independently. At the same time, a balance is required to avoid overstimulation as clinical observations suggest that stress has the potential to worsen ADHD symptoms (Nadeau 1997). Also pertinent is having some clear means to evaluate work performance as adults with ADHD were more likely to seek out discriminative feedback in a workplace simulation experiment (Delisle and Braun 2011). Incentives and rewards may be particularly important to adults with ADHD; if not directly built into the job, it may be helpful to set up a feedback system, perhaps with a close mentor or supervisor, to provide such tangible rewards to help structure and prioritize their work. Supportive supervision and encouragement are key (Nadeau 1997, 2005), and regular, consistent, and constructive feedback from a respected mentor or boss can also facilitate necessary changes to improve effectiveness in work activities. The potential adverse impact of ADHD may be substantially diminished when an individual with ADHD finds a position they enjoy in a supportive and flexible work environment that maximizes their strengths and minimizes or compensates for their weaknesses.

31.3.3.3 Medication

Medication is typically the first-line treatment for ADHD. Multiple studies have demonstrated the efficacy of various stimulant and other alertness-promoting medications in reducing ADHD symptoms (Dupaul et al. 2012; Simpson and Plosker 2004; Weisler et al. 2006; Wender et al. 2011) and improving neuropsychological task performance (Schweitzer et al. 2004; Turner et al. 2005; Turner et al. 2004). Any medication trial should involve continued follow-up with a specialist, such as a psychiatrist, to track efficacy and side effects, and make any adjustments as needed. Limited research has directly assessed the effects of medication on work-relevant outcomes. However, a workplace simulation study demonstrated improved work performance throughout the day and reduced ADHD symptoms following treatment with lisdexamfetamine dimesylate compared to placebo (Wigal et al. 2010). Driving is another relevant real-world activity and potential occupational task that has received attention as ADHD is associated with poorer driving and increased likelihood of traffic citations and motor vehicle accidents (Barkley et al. 2002a, b; Barkley et al. 1996a). Driving simulation studies have shown improved driving performance following treatment with methylphenidate (Barkley et al. 2005; Cox et al. 2004). The potential benefits of medication treatment may have long lasting effects. Several studies in Norway, where medical history and treatments are well documented, have suggested that delayed or lack of medication treatment for ADHD in childhood is correlated with worse adult occupational outcomes (Gjervan et al. 2012; Halmøy et al. 2009). This is particularly intriguing given that children who were targeted for medication treatment would have likely exhibited more severe symptoms and impairment. However, it is unclear if this is a medication-specific effect or general benefit of addressing ADHD symptoms, particularly given that medication did not confer long-term benefits over other treatment approaches in a large prospective study (Molina et al. 2009). Additionally, medications are not without potential adverse side effects, including insomnia, headaches, and anxiety. About 20–50 % of adults are considered nonresponders (Wender 1998) and adult responders may only show a 50 % or less reduction in core ADHD symptoms (Wilens et al. 2002). These factors may thus reduce the viability of medication for some individuals. Further, given the potentially wide-reaching effects of ADHD on life functioning, a more comprehensive treatment approach may be best able to achieve lasting benefits.

31.3.3.4 Psychosocial Interventions

Research is growing on the effectiveness of psychosocial interventions for ADHD. Clinical experience and more recent attention to non-medical treatments have suggested that these methods have the potential to reduce the impact of ADHD symptoms on functioning and, perhaps, workplace success. Some of the more frequently used approaches are described below.

Psychoeducation

Education about ADHD is an important first step in making changes in ineffectual behavior patterns, and it is a core aspect of most treatment approaches (Knouse et al. 2008). Speaking with experts in the field and reading scientifically based materials will help individuals gain an understanding about the impact of ADHD symptoms, and increase insight and empathy into their own experience (Murphy 2005). Adults with ADHD have rated this aspect of treatment as particularly helpful (Philipsen et al. 2007). Ultimately, improved understanding and knowledge about the condition can assist adults with ADHD in developing realistic goals and compensatory strategies to minimize impairment. A key component of such education and effective interventions is for individuals to recognize that ADHD is a chronic condition. Thus, symptom management will be an ongoing process that requires significant individual effort and a consistent commitment to making long-term changes in habits and lifestyle (Murphy 2005).

Cognitive-Behavioral Therapy (CBT)

The benefits of CBT have been clearly demonstrated for other disorders such as depression and anxiety (Butler et al. 2006; Hofmann and Smits 2008). Given that many adults with ADHD do not respond to medication treatment or experience adverse side effects, and may continue to be plagued by residual symptoms or functional deficits (Wender 1998; Wilens et al. 2002), there has been renewed interest in developing systematic CBT treatments specifically for ADHD. Findings thus far have been positive. Medication treatment plus CBT has been shown to be more effective than medication alone (Emilsson et al. 2011; Safren et al. 2005). Findings from a long-term, large-scale study provided further support for this approach by demonstrating that individuals who were treated with medication but still experienced difficulties benefited from CBT; this resulted in more positive and lasting outcomes on ADHD symptoms and overall functioning compared to a control group treated with medication plus relaxation training and education support (Safren et al. 2010b). Specific components of the CBT intervention included psychoeducation, reframing and restructuring negative cognitions that increased maladaptive behaviors, and developing compensatory and behavioral strategies to address ADHD symptoms (e.g., learning to organize and prioritize, reduce distractions). Brief (Virta et al. 2010) and group-based CBT (Bramham et al. 2009; Salakari et al. 2010) have also been shown to have benefits. Functional improvements may continue after the cessation of treatment (Emilsson et al. 2011; Salakari et al. 2010) and may additionally improve symptoms of other comorbid psychological conditions such as depression and anxiety (Bramham et al. 2009; Emilsson et al. 2011). Further, a pilot study that included individuals with milder ADHD symptoms who chose not to take medication suggested that CBT alone was associated with improvements in ADHD symptoms, functioning, depression, and anxiety (Ramsay and Rostain 2011). Taken together, these results suggest that adults with ADHD obtain significant benefit from the functionally relevant and goal-directed approach of CBT. Significant benefits have also been shown for group treatments that included similar underlying principles within a dialectical-behavioral approach (Philipsen et al. 2007) as well as metacognitive therapy (Solanto et al. 2008; Solanto et al. 2010). The development of practical skills in these approaches has the potential to lead to lasting benefits by helping individuals cope more effectively with ADHD symptoms in multiple contexts.

Coaching

Coaching is an increasingly popular, action-oriented approach to managing ADHD that involves the practical implementation of the client's goals and "getting things done" (Favorite 1995). The focus is not on developing an understanding of or insight into thoughts and behavior, but rather on helping the adult with ADHD take charge of their life, set goals, and make behavioral changes (Murphy 2005). Unlike therapeutic approaches, coaching does not address the comorbid depression and anxiety that may impede progress in achieving coaching goals (Kubik 2010), and thus is most appropriate as an adjunctive treatment or for individuals with little comorbid psychopathology (Goldstein 2005). Also discriminating it from therapeutic approaches is the greater emphasis on handling specific problems and situations rather than learning more general coping skills that can be applied in multiple contexts (Knouse et al. 2008). Goldstein (2005) expressed concerns about the lack of controlled studies to demonstrate the efficacy of coaching and the fact that it is practiced by professionals from a variety of backgrounds and disciplines, without any systematic training or standardized approach. One study designed to assess outcomes of ADHD coaching used an observational approach and provided preliminary support for the benefits of learning strategies to manage problems associated with attention, organization, and task completion (Kubik 2010). Thus, further study is required to establish the potential effectiveness of coaching, although it is likely that outcome will vary widely depending on the characteristics of the individual seeking treatment and the experience and practices of the coach.

31.3.3.5 Additional Workplace Recommendations

Specific strategies that may be beneficial will vary among individuals based on the nature of the impact of their ADHD symptoms in the workplace. For example, for individuals who have difficulty focusing on tasks that are not closely aligned with their personal interests, it may be especially important for them to select a job or profession that includes the types of activities that are most likely to keep them engaged and focused (Barkley 2010). Additionally, many workers with ADHD struggle with time management and punctuality, which can be addressed through extensive use of planners, reminders, and timers. More details on this recommendation are provided in Sect. 31.8 of this chapter, along with examples of additional interventions and accommodations that may be helpful for the problems with attention and executive functions that are common in ADHD.

31.4 Mild Traumatic Brain Injury

31.4.1 Overview: Mild Traumatic Brain Injury

Traumatic brain injury (TBI) refers to a disruption in neural functioning resulting from the impact of physical trauma upon the brain. This traumatically induced neural disruption can range from mild injuries with only transient effects to severe injuries that are life-threatening and result in lasting deficits. Motor vehicle accidents, accidental falls, and participation in sports are the most common causes of TBI among civilians in the United States (Bazarian et al. 2005; Cassidy et al. 2004). Of the 1.7 million TBIs suffered in the United States per year, the vast majority (70–90 %) involves a relatively brief loss/alteration of consciousness or post-traumatic amnesia, and is graded as "mild" (i.e., a "concussion") using typical clinical criteria (Cassidy et al. 2004; Faul et al. 2010). "Mild" TBI often includes a brief loss of consciousness (lasting less than 30 min), or a feeling of being dazed/confused immediately following the injury. Whereas the reader can find an in-depth discussion of return to work after moderate-to-severe TBI elsewhere in this volume, focus within this subsection will be upon return to work after mild TBI.

In the immediate aftermath of a mild TBI, affected individuals commonly report symptoms such as headache, dizziness, fatigue, difficulty concentrating or remembering information, sensitivity to light or noise, or irritability. These symptoms are often accompanied by cognitive deficits on neuropsychological testing, including mild to moderate impairments in learning, memory, attention and concentration, processing speed (e.g., slowed information processing), and executive functions (e.g., difficulty with planning, organization, and behavioral control) (Brewer et al. 2002; Brooks et al. 1999; Landre et al. 2006; McCrea et al. 2002). Fortunately, these post-concussive symptoms and cognitive deficits tend to resolve over the first few weeks and months post-injury (Iverson and Lange 2003). Rigorous studies of mild TBI have generally found that residual symptoms and cognitive deficits are subtle or absent in most individuals by 3 months post-injury (Ettenhofer and Abeles 2009; Ettenhofer and Barry 2012; Frencham et al. 2005; Schretlen and Shapiro 2003). However, some individuals are likely to be more vulnerable to the effects of mild TBI than others, and the impact of factors such as age, number of injuries, and mechanism of injury on susceptibility to neural damage and disability after mild TBI is not yet clearly understood (Belanger et al. 2009; Collins et al. 2002; Hanlon et al. 1999; Iverson et al. 2006; Iverson et al. 2004).

Despite the positive recoveries experienced by most individuals who suffer a mild TBI, studies suggest that 5–10 % of those with mild TBI may continue to experience significant post-concussive symptoms in the long-term phase of recovery (Iverson 2005; Wood 2004). These symptoms should not be considered as direct reflections of brain injury, as there are a number of other factors that can also have significant effects upon symptom expression. For example, the typically subtle long-term effects of neural injury in mild TBI can be contrasted with the much larger and better-established influence of factors such as distress, history of psychiatric illness, or litigation (e.g., extrinsic motivation to exaggerate symptoms/deficits) on long-term outcomes after mild TBI (Belanger et al. 2005; Carroll et al. 2004; Dikmen et al. 2010; Ettenhofer and Abeles 2009; Ettenhofer, Reinhardt and Barry, 2013; Iverson 2006; Lees-Haley and Brown 1993).

Importantly, cognitive symptoms that may be reported by patients in the long-term phase of recovery from mild TBI do not always correspond to objective cognitive deficits. Research suggests that many individuals with a history of mild TBI who report long-term subjective difficulty with concentration, memory, or other cognitive symptoms are able to maintain objectively "normal" levels of performance on cognitive tests. Some of the discrepancy may be due to non-neurological factors described above. However, it is possible that for at least a subset of individuals with a history of mild TBI, long-term cognitive symptoms might result from changes in brain function, rather than overt cognitive deficits. Studies that examine brain activation during the completion of cognitive tests suggest that "normal" performance after mild TBI may involve more extensive use of neural networks than those without a history of brain injury (Chen et al. 2004; McAllister et al. 1999; McAllister et al. 2001). Simply put, some individuals with a history of mild TBI may have to "work harder" to complete challenging cognitive tasks due to reduced cognitive efficiency. If so, the additional cognitive effort required to overcome reduced efficiency might also help to explain post-concussive symptoms such as fatigue, headache, irritability, and difficulty concentrating. Further research will be needed to evaluate this possibility. In the meantime, the framework of reduced cognitive efficiency may be useful for understanding the experiences and optimizing patients' functional capabilities.

31.4.2 Effects of Mild Traumatic Brain Injury on Workplace Functioning

Whereas most individuals resume employment within 1–3 months after mild TBI, 9–14 % experience long-term problems resuming full-time employment (Boake et al. 2005; Larrabee 1999). Due to difficulties characterizing long-term cognitive deficits after mild TBI, few studies have directly investigated links between cognitive deficits and successful return to work. However, evidence suggests that patients who are dealing with continued symptoms or cognitive deficits following mild TBI may have difficulty returning to previous levels of functioning. An accurate understanding of the factors underlying these functional impairments is essential to effective planning of rehabilitative interventions.

For example, Lundin et al. (2006) found that 25 % of mild TBI patients reported continued difficulty in occupational, social, or personal functioning at 3 months post-injury. Additionally, the degree of functional difficulties reported was strongly related to overall severity of persisting symptoms. Along these lines, it appears likely that the origin of persisting symptoms (e.g., from neural injury vs. coexisting depression) may be less important to functional outcome than the nature of the symptoms themselves. Similarly, in a prospective study of active duty military personnel who had sustained non-combat mild TBIs, Drake et al. (2000) found that more severe subjective symptoms and poorer performance on measures of memory, verbal fluency, or planning at baseline were predictive of reduced duty (work) status 3 months later. Therefore, both subjective symptoms and objective cognitive performance appear to be important to return to work after mild TBI. These authors also found that lower-ranking individuals had poorer vocational outcomes, suggesting that greater work experience may have buffered against TBI effects or facilitated adaptation to injury (Drake et al. 2000).

Although initial injury severity (e.g., mild vs. moderate vs. severe) is frequently associated with later vocational functioning, these mild TBI findings are also generally consistent with the results of studies of individuals with more severe brain injuries. Multiple studies including individuals with TBIs of mixed severity have found that intelligence, executive functioning, and memory may each contribute to post-injury employment status (Benedictus et al. 2010; Cifu et al. 1997; Kalechstein et al. 2003; Ross et al. 1997). Older age at injury has been shown to be negatively associated with employment status after TBI (Wehman et al. 2005), and individuals of minority racial and ethnic backgrounds have been shown to be significantly less likely to return to work after TBI, compared to whites (Arango-Lasprilla et al. 2008; Kreutzer et al. 2003). Additionally, higher levels of educational and occupational attainment have been associated with successful return to work after TBI (Walker et al. 2006).

Type of occupation has also been found to influence RTW outcome across the spectrum of TBI severity, with the best prospects for successful return to work among people with professional/managerial jobs (Walker et al. 2006). Therefore, to the degree that similar factors may be important to both recovery and return to work after mild TBI, it would appear that individuals who are older or have lower levels of education, job status, or job experience, may be at greater risk for difficulty returning to work after injury.

31.4.3 Enhancing Workplace Functioning After Mild Traumatic Brain Injury

31.4.3.1 Mild Traumatic Brain Injury Assessment

The previously summarized findings describe the potential for functional impairment after mild TBI and highlight a number of factors that appear to be important to successful return to work after injury. In order to make use of this information, return to work interventions for mild TBI need to begin with (and be informed by) some assessment of this relatively broad range of medical, cognitive, psychosocial, and demographic factors. A brief assessment may be sufficient to plan interventions or accommodations that may be needed for individuals who are found to be at relatively low risk for poor clinical outcomes or difficulty returning to work after mild TBI. However, among patients who are experiencing high levels of symptoms or who appear to be at risk of poor recovery, referrals for more comprehensive evaluation or treatment may be warranted (beyond the initial medical evaluation).

If there is concern (on the part of the patient or the patient's providers) about cognitive deficits that may be more severe or longer-lasting than would typically be expected, referral for neuropsychological evaluation should be considered.

The neuropsychological evaluation can provide an objective basis for evaluating the patient's cognitive abilities to determine whether cognitive recovery is "on track" and to identify relative cognitive and psychological strengths and weaknesses that are relevant to functional recovery. Additionally, neuropsychological evaluation may assist with differentiating the many medical, cognitive, neurological, psychological, and social factors that commonly impact the overall clinical picture. In many cases of mild TBI, the evaluation will provide the patient with objective evidence that cognitive performance falls within the expected range, thus providing a confidence boost to those who may be hesitant to re-engage with challenging activities. This feedback can be paired with education about the typical course of recovery and recommendations about graded return to work.

31.4.3.2 Medication

A patient with post-concussive symptoms such as headache, fatigue, or anxiety that persist beyond the first few days or weeks post-injury may benefit from a referral to a neurologist or psychiatrist with expertise in mild TBI to evaluate the potential value of time-limited medication treatments for these symptoms. However, it is important to remember that many medications that are used to treat symptoms such as headache or anxiety have significant cognitive side effects, such as "fogginess" or fatigue. While all physicians are trained to provide symptom relief to their patients, most are not automatically focused upon maximizing workplace functioning per se. As a result, types and dosages of medications that are used may not be optimally balanced to the patient's goals. This can be a difficult balance to achieve, but the process can be improved through explicit consideration and consultation regarding the cognitive demands of the workplace. Patients may need to work with their providers over time to optimize treatments in consideration of evolving symptoms and side effects. Additionally, awareness of the potential for cognitive side effects will make patients and providers less likely to misattribute side effects of medication to the effects of the injury, and more effective at managing the processes of treatment and return to work.

31.4.3.3 Psychosocial Interventions

Cognitive Remediation

Very little research has been conducted regarding behavioral remediation of cognitive difficulties after mild TBI (e.g., practicing or training on cognitive tasks with the intent of addressing cognitive weaknesses). Nevertheless, cognitive remediation can be a positive and engaging activity, and evidence for its effectiveness among individuals with more severe TBIs (including strategy training for mild memory impairment, strategy training for post-acute attention deficits, and interventions for functional communication deficits [Cicerone et al. 2005]) suggests that similar activities could be effective for mild TBI as well, particularly if they are optimized to provide a challenge for individuals with milder cognitive and functional deficits.

Psychoeducation and Expectation Management

Throughout the process of evaluation and treatment, it is essential that providers be aware of the potentially powerful role of expectations in recovery from mild TBI. Evidence suggests that patients who *expect* to experience a poor recovery from mild TBI are likely to experience more severe and longer-lasting symptoms (Gunstad and Suhr 2002). For example, a patient who believes that they have sustained significant and permanent "brain damage" is likely to attribute problems such as poor concentration to the injury and to have negative expectations for recovery. By contrast, a patient who is aware that long-term symptoms are the exception rather than the norm may be more likely to attribute these perceived problems to more probable, modifiable, and benign causes such as everyday stressors or medication side effects.

Considering that most people recover well from mild TBI and are able to return to work successfully, health care and employment assistance providers should combine their attempts to assist the patient with accurate representations of the typically favorable path of recovery from mild TBI. For this reason, many providers prefer to use the term "concussion" rather than "mild TBI" in order to head off potential misconceptions about prognosis after brain injury. Indeed, one of the best-supported interventions for post-concussion syndrome involves "cognitive restructuring," whereby the patient is educated about the typical course of recovery from mild TBI, and patients' concerns about ongoing symptoms are discussed in terms of their most likely causes (Mittenberg et al. 2001).

31.4.3.4 Additional Workplace Recommendations

When an individual does return to work after mild TBI, some exacerbation of symptoms such as fatigue, difficulty concentrating, or irritability may occur. Whether it is due to residual cognitive inefficiency, normal challenges of re-engaging in work activities after a period of absence, or some other cause, these problems should be treated as temporary and expected parts of the process. The return to work process should include progressive increases in hours per day as well as the number/complexity of work duties. This graded resumption of previous activities may help to minimize the likelihood that an individual will experience failure in terms of work performance or feeling overwhelmed by symptoms, and is likely to maximize the likelihood that a patient will be among the majority of those with a history of mild TBI who return to work successfully.

For individuals with persisting cognitive difficulties, the pattern of cognitive strengths and weaknesses identified on formal neuropsychological assessment can be used to make recommendations about compensatory strategies. For example, a patient with weaknesses in processing speed, memory, and executive functions may be instructed to allow additional time to complete tasks, take more frequent breaks, record important information on a notepad or smartphone, and avoid multitasking when possible. With the patient's permission, a parallel set of recommendations could be communicated to the patient's employers in order to facilitate the flexibility and structure needed to implement these changes to their work schedule, duties, or environment. Similarly, a summary of the neuropsychological evaluation could be forwarded to other providers or occupational specialists to facilitate the development of more detailed return to work plans and accommodations. Please see Sect. 31.8 of this chapter for additional recommendations that may be useful.

31.5 HIV/AIDS

31.5.1 HIV/AIDS: An Overview

As of 2008, an estimated 1.2 million persons in the United States aged 13 and over were HIV-positive, and approximately 480,000 were living with a diagnosis of AIDS (Centers for Disease Control and Prevention 2011). In addition to its negative effects upon the immune system, HIV is often able to cross the blood-brain barrier, resulting in inflammation and degeneration of neural tissue (Resnick et al. 1988). Cognitive deficits among individuals with HIV/AIDS are most commonly noted in the domains of attention, processing speed, memory, executive functions, and motor functions (Cysique et al. 2006; Reger et al. 2002). As with many other mild cognitive disorders, cognitive deficits that may be apparent to individuals living with HIV/AIDS may or may not be detected by typical neurocognitive tests. However, functional neuroimaging suggests that altered patterns of brain activation and connectivity can be detected, even in groups with mild or undetectable HIV-related cognitive impairments (Castelo et al. 2006; Chang et al. 2001; Melrose et al. 2008).

Up to half of HIV-positive individuals will eventually experience some degree of neurocognitive decline, ranging from mild cognitive deficits that have subtle effects upon functioning to severe cognitive deficits that can impair even basic activities of daily living (e.g., HIV-associated dementia) (Heaton et al. 1995; Heaton et al. 2004). Although rates of HIV-associated dementia have decreased in recent years, the prevalence of milder forms of HIV-related cognitive impairment may have increased (Bottiggi et al. 2007; Brew 2004).

A number of antiretroviral medications (often used in combination) are available to minimize the impact of HIV. Aside from improving markers of immune function such as CD4 count and HIV viral load, these treatments can also be effective at mitigating HIV-related cognitive decline (Brouwers et al. 1997; Catz et al. 2000; Clerici et al. 2002; Martin et al. 1999; Suarez et al. 2001). Unfortunately, high rates of medication adherence are believed to be necessary to successfully suppress viral activity, and studies suggest that only 50–60 % of patients are able to successfully maintain this level of adherence (Gifford et al. 2000; Hinkin et al. 2004). Along with factors such as younger age, substance abuse, and depression, the presence of cognitive impairments is itself a risk factor for poor adherence to complex antiretroviral medication regimens (Albert et al. 1999; Gonzalez et al. 2011; Hinkin et al. 2004; Waldrop-Valverde et al. 2006). As a result, HIV-positive individuals who experience cognitive decline due to suboptimal treatment adherence may find themselves in a "downward spiral" whereby continued cognitive decline is followed by increasing difficulty maintaining adherence (Ettenhofer et al. 2010).

31.6 Effects of HIV-Related Cognitive Problems on Workplace Functioning

Prior to the introduction of advanced antiretroviral medications, many individuals discontinued work shortly after discovering that they had contracted HIV in preparation for major health problems and a greatly reduced lifespan. Since that time, the relative success of these antiretroviral treatments has transformed HIV/AIDS into a chronic disease requiring active management but not necessarily discontinuation of major life activities such as work. One study of employment among men with HIV found that 20 % were employed full time for the entire 30-month follow-up period, whereas 9 % were continuously employed part time, 40 % were continuously unemployed, and 31 % experienced a change in employment status (Rabkin et al. 2004). Importantly, 13 % had returned to work or increased hours from part time to full time.

Several studies have found that unemployment among individuals with HIV/AIDS is associated with severity of cognitive impairment (Albert et al. 1995; Heaton et al. 1994; van Gorp et al. 1999; van Gorp et al. 2007). For example, both Heaton et al. (1994) and van Gorp et al. (1999) found that HIV-positive individuals who were classified as "cognitively impaired" were about twice as likely to be unemployed. Those HIV-positive individuals who continued to work despite cognitive impairment were five times more likely to report a reduction in their work performance (Heaton et al. 1994).

Additional research has identified specific aspects of cognitive performance that are most likely to affect occupational functioning among individuals with HIV/AIDS. van Gorp et al. (2007) found that better performance on a list learning measure was strongly predictive of successful return to work over a 2-year follow-up period. These findings may reflect the importance of being able to process and retain new information to these individuals' confidence and abilities in returning to work. Additionally, Rabkin et al. (2004) demonstrated that those who performed better on measures of executive functions at baseline (specifically, speeded mental flexibility and inhibition) ended up working significantly more hours over the next 3 years. Potentially, these individuals may have been better able to adapt to changing work demands or schedules, or to avoid impulsive actions that might interfere with their work.

In addition to the cognitive factors described above, a number of other factors can also have a significant impact on occupational function among those with HIV/AIDS. As shown by Rabkin et al. (2004), individuals with physical limitations, disability benefits, lower levels of education, and past or present mood disorder diagnoses tended to work less over the 3-year follow-up period. Neuropsychiatric issues such as depression are particularly relevant to cognitive decline in HIV/AIDS in terms of their origins and the health care settings in which they may be assessed and treated. For example, some individuals who are dealing with the psychological challenge of confronting cognitive decline or other effects of HIV illness may respond with feelings of hopelessness or despair. Alternately, symptoms of mood disorder such as apathy or fatigue may also represent neuropsychiatric effects of HIV-related neurodegeneration (Hinkin et al. 2001). Finally, treatments for HIV/AIDS themselves may at times pose barriers within the workplace. For example, many HAART medications must be taken several times a day. The logistics of these treatments can make proper adherence logistically challenging or conspicuous in some workplaces.

31.6.1 Enhancing Workplace Functioning Among Individuals with HIV-Related Cognitive Decline

31.6.1.1 Assessment in HIV/AIDS

As described above, individuals with mild cognitive decline in the context of HIV/AIDS frequently experience challenges in returning to work and maintaining optimal occupational functioning. Comprehensive assessment of medical, neurocognitive, neuropsychiatric, and psychosocial functioning can be extremely useful to guide treatments, work accommodations, or individual adjustments that can be helpful. This can be based upon information gathered both from the patient's own perspective (e.g., symptom complaints) and from formal evaluation (e.g., neuropsychological testing).

31.6.1.2 Medication Adherence

As a preventable neurodegenerative disorder, the first consideration for enhancing occupational functioning should be mitigating future decline. Because cognitive decline can serve as both a cause and an effect of poor adherence in HIV/AIDS, the potential exists for a downward spiral whereby cognitive deficits and medication adherence each continue to worsen (Ettenhofer et al. 2010). This issue highlights the importance of appropriate medication adherence to maintaining the cognitive abilities that support work activities. A number of potential interventions can assist with medication adherence in this population. First, patients should be educated about the importance of antiretroviral medications to supporting brain function, and should be trained on strategies that are appropriate to their situation such as pillboxes, checklists, and electronic reminders. Similarly, work schedules and activities can be structured or modified to facilitate timely medication use in the workplace as well as at home.

31.6.1.3 Psychosocial Interventions

It is essential that potential neuropsychiatric symptoms of HIV/AIDS, such as depression and anxiety, be evaluated and treated to ensure that these symptoms do not compound cognitive difficulties or interfere with work through reduced motivation for work activities or reduced confidence in work performance. Treatment can include medications and/or psychotherapy. In addition, improved awareness of cognitive limitations, on the part of patients as well as their employers, can be useful to prevent misattribution of difficulties that are encountered and promote realistic expectations of performance.

31.6.1.4 Additional Workplace Recommendations

As described previously, common cognitive deficits in HIV/AIDS include difficulties with attention and concentration, learning and recall, executive functions such as multitasking, organization, inhibition, and initiation of behavior (e.g., "getting stuck"), and slowing/errors with information processing and motor movements (Cysique et al. 2006; Reger et al. 2002). Many of these individuals will present as disorganized, "scattered", unmotivated, or easily frustrated, yet be capable of highly skilled work performance within areas of expertise. Accommodations can be made to support workplace performance. For example, individuals with subtle cognitive deficits due to HIV/AIDS will need extra time to complete complex tasks, and should avoid multitasking when possible to minimize errors and enhance overall efficiency. Many of these individuals also benefit from the provision of additional (external) structure, organization, and direction through activity planning, and frequent use of task lists and written or electronic reminders. Examples of additional interventions and accommodations that may be helpful for specific types of cognitive deficits are provided in Sect. 31.8 of this chapter.

31.7 Age-Associated Mild Cognitive Impairment

31.7.1 Age-Associated Mild Cognitive Impairment: An Overview

The normal aging process is associated with changes to cognition. As aging occurs, psychomotor speed slows, meaning that it takes individuals longer to do cognitive tasks. Other aspects of cognition, such as learning and memory, problem solving, visuospatial abilities, and word finding, can decrease as part of the normal aging process (Lezak et al. 2004). However, these normal age-related changes are not to the degree that individuals will experience significant difficulties in their day-to-day functioning. Older adults may complain of increased forgetfulness or difficulties learning the names of new people, but are generally able to function quite well and have only minor difficulties remembering important events, managing financial information, or maintaining work success. In contrast, dementia refers to a decline in cognitive abilities that significantly interferes with one's ability to manage essential day-to-day activities. When older adults have declines in cognitive functioning that are greater than would be expected based on the normal aging process, but are generally able to function independently, a diagnosis of Mild Cognitive Impairment (MCI) is considered. In the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5), this impairment is subsumed under diagnosis of Mild Neurocognitive Disorder, while dementia is termed Major Neurocognitive Disorder (APA 2013).

It is estimated that up to 14 % of the US population over the age of 71 has dementia (Plassman et al. 2007). Dementia (also termed Major Neurocognitive Disorder) is defined as a cognitive disorder in which a patient presents with cognitive deficits (e.g., problems with memory, language, perception, movements, or higher-order executive functions). These deficits represent a decline from previous levels of functioning and result in functional impairments (APA 2013). The most common form of dementia is Alzheimer's disease (AD), whereas the second most common form of dementia is due to cerebrovascular disease (stroke). Additional dementing diagnoses include Lewy-Body dementia, Frontotemporal dementia (FTD), Parkinson's disease, and Creutzfeldt-Jakob disease (Alzheimer's Association 2011). While dementia is typically thought of as a disorder affecting later life, it can occur earlier in the lifespan. For example, an estimated 200,000 individuals under the age of 65 have AD (Alzheimer's Association 2006), and frontotemporal dementia can occur in individuals as young as age 40 (McKhann et al. 2001). Although the majority of people with dementia have retired by the time the diagnosis is made, there are many cases in which an individual will start to develop an age-related cognitive impairment while still employed, which might necessitate neuropsychological testing, fitness for work evaluations, and determination of appropriate work accommodations.

Mild Cognitive Impairment (MCI) refers to a state in which a patient has not met criteria for dementia, but appears to be having cognitive difficulties greater than would be expected based for one's age. MCI was initially conceptualized to reflect those individuals at greater risk for development of AD (Petersen et al. 1999), although in recent years the term has been revised to identify individuals at risk for any form of dementia (Petersen 2004; Winblad et al. 2004). MCI is classified in four general subtypes reflecting the types of cognitive deficits a patient exhibits. Patients are classified by whether they show an objective memory impairment or an impairment in another cognitive domain (amnestic MCI vs. non-amnestic MCI), and then whether they demonstrate cognitive deficits within a single domain versus multiple domains (Petersen 2004; Winblad et al. 2004). Non-memory domains that may be commonly affected in MCI include attention, executive functioning, language, and visual/spatial ability.

Patients with MCI can have cognitive difficulties for many different reasons. MCI can represent the earliest stage of any of the dementias, including AD or FTD. It can also capture mild difficulties due to cerebrovascular disease. Other causes of cognitive difficulties in the elderly include metabolic disease, neoplasm, prion disease, and psychiatric disorder (such as depression and anxiety). It is estimated that up to 18 % of patients with MCI will progress to a dementia diagnosis over the course of 1 year (Gauthier et al. 2006). Although not all patients with MCI will progress to a diagnosis of dementia, patients eventually diagnosed with dementia will have typically passed through an MCI stage.

31.7.2 Effects of Mild Cognitive Impairment on Workplace Functioning

Perhaps because many patients with MCI have already retired by the time of diagnosis, there is little information on occupational functioning in MCI. However, the average age of retirement for men has increased from 62 to 64 over the last 20 years. Due to changes in benefits such as social security, pension, post-retirement health care, as well as changes to the American workforce such as higher education, improved health, and greater number of female workers, the retirement age may continue to increase over time (Munnell 2011). As such, the number of individuals working with MCI is also likely to increase. As stated previously, the cognitive difficulties patients with MCI experience are not expected to render an individual unable to manage employment. While these patients do have cognitive symptoms, they are for the most part able to manage important day-to-day activities. That being said, several studies have shown that patients with MCI may experience subtle difficulties with Instrumental Activities of Daily Living (IADLs) (Binegar et al. 2009; Burton et al. 2009; Kim et al. 2009; Pereira et al. 2008; Perneczky et al. 2006; Rabin et al. 2006; Teng et al. 2010). IADLs refer to important self-care tasks, such as managing personal financial information, managing and remembering to take medications, driving/taking public transportation, and food shopping and preparation. While IADLs are typically conceptualized as tasks one engages in to support their home lives, many of the skills required to complete IADLs are relevant to occupational success.

It has been suggested that those functional tasks that require greater cognitive demands are those that are most difficult for MCI patients (Reppermund et al. 2011). These tasks include activities such as managing finances or other business affairs, managing/remembering to take medications, accurately taking phone messages, planning activities, remembering appointments or events, judgment in safety situations, concentrating while reading, multitasking, coping with unfamiliar situations, and performing a task while under pressure (Bangen et al. 2010; Brown et al. 2011; Mariani et al. 2008; Reppermund et al. 2011; Yeh et al. 2011). Some MCI patients may also show more difficulty with shopping independently, preparing food, or performing household chores (Mariani et al. 2008; Yeh et al. 2011). With regard to the cognitive difficulties underlying these problems, in MCI, poorer IADLs appear associated with poorer memory, slowed processing speed, poorer executive functioning, and/or poorer global cognition (Brown et al. 2011; Jefferson et al. 2008; Marshall et al. 2011; Reppermund et al. 2011; Teng et al. 2010; Yeh et al. 2011).

Extrapolating from the research on IADLs, it appears that patients with MCI are at risk of experiencing difficulties at work. It follows that patients would have difficulties remembering important events or upcoming meetings, concentrating, multitasking, trouble-shooting, managing financial and legal documents, and taking accurate notes/messages. Consistent with this inference, clinical experience suggests that patients with MCI do report work difficulties. Complaints include inability to multitask, difficulty completing complex tasks under time constraints, difficulty remembering to do all subcomponents of large work projects, feeling like work has become more effortful, difficulty recalling details of conversations, repetitive questions to coworkers, and forgotten appointments. Again, extrapolating from the research on the link between cognitive symptoms and IADLs, it appears that these difficulties can reflect a host of cognitive weaknesses, but are most likely to be related to poor memory and/or executive dysfunction.

31.7.3 Enhancing Workplace Functioning in Mild Cognitive Impairment

31.7.3.1 The Relevance of Underlying Causes of Cognitive Difficulties

In MCI, the decision to continue at work is largely driven by the cause of the cognitive difficulties. Patients with a neurodegenerative disorder such as Alzheimer's Disease or Frontotemporal Dementia will be expected to worsen over time. Treatment is focused on pharmacological interventions that work to slow the progression of the disease, and/or interventions to minimize possible psychiatric symptoms such as agitation, anxiety, apathy, or psychosis. Behavioral/environmental manipulations are also employed, such as keeping individuals active in social activities and hobbies. While an individual may be motivated to continue to work as long as possible, it may also be appropriate to consider a plan for retirement.

In contrast, cerebrovascular disease is not necessarily progressive. While previous history of stroke represents one of the greatest risk factors for future stroke, not all patients will decline over time. After a cerebrovascular event, many patients are able to recover considerable function. Difficulty returning to work is associated with many factors, including severity of the neural injury (Roberts et al. 2004), poorer cognitive functioning (Vilkki et al. 2004), depression (Vilkki et al. 2004), fatigue (Andersen et al. 2012), and blue collar occupation (Tanaka et al. 2011).

It is also possible that MCI represents cognitive inefficiency secondary to psychiatric distress. For some individuals, psychiatric symptoms can become so debilitating that they are no longer able to work effectively. Currently recommended treatments for depression in geriatric populations include antidepressants and/or various psychotherapies (Bartels et al. 2002). While there is less research in anxiety disorders in the elderly, similar recommendations are made, with caution that anti-anxiety medications can have side effects that are problematic for older adults (Bartels et al. 2002).

As can be inferred from the discussion above, when an individual is diagnosed with MCI, there can be many reason(s) for the cognitive impairment. In many cases, the cause of the difficulties is unclear. Not all patients with MCI progress to dementia; many remain stable or even revert to normal cognition within a 1-year time period (Ganguli et al. 2011). Patients with MCI may be able to continue at work with accommodations that assist with the cognitive weakness. However, depending on the age and financial status of the patient, it may be appropriate to consider retirement.

31.7.3.2 Mild Cognitive Impairment Assessment

If an older adult begins to experience difficulties at work without obvious cause, a dementia process may be involved. The first step would be for the individual to undergo a diagnostic work-up. The individual should visit his/her physician to begin the process, and it is likely that a referral will be made to a specialist such as a neurologist or geriatric psychiatrist. Dementia evaluations involve a medical exam/history to fully capture all ongoing medical issues that may be contributory, blood work to identify potential reversible causes of cognitive impairment, and neuroimaging (e.g., CT, MRI, PET scan) if indicated. The evaluation also involves an examination of cognitive functioning. This may include a referral to a neuropsychologist to perform a specialized assessment designed to detect subtle cognitive difficulties. Once the cause of the decline is understood, a treatment plan will be developed. If the cognitive symptoms appear to reflect a progressive disorder such as AD or FTD, it is unlikely the patient will be able to work long into the future. In this case, plan for retirement may be indicated. In certain occupations, such as physician, nurse, teacher, police officer, or pilot, the employer is expected to initiate Fitness for Duty examinations when the early signs of cognitive decline emerge and adversely affect occupational performance.

For those diagnosed with AD, FTD, and some other forms of dementia before the age of 65, it may also be possible to apply for Social Security Disability Insurance (SSDI) or Supplemental Security Income (SSI). Further details on eligibility can be found at socialsecurity.gov and more information about the process can be found through the Alzheimer's Association (alz.org). If the symptoms began following stroke, it is possible that cognitive rehabilitation will assist the person to become functional on either a part- or full-time basis. If the symptoms appear to reflect an emerging psychiatric disorder (depression, anxiety), psychological treatment may improve functioning.

31.7.3.3 Workplace Accommodations

When the goal is for an individual to continue working, accommodations can be made to increase work productivity. Because patients with MCI typically take longer to do things and need to check their work, more time should be allotted to finish important tasks, and important tasks and notes should be recorded using a reliable method. Multitasking is also frequently difficult for patients with MCI. Structuring time and focusing on only one task at a time (e.g., do not answer the phone or check emails while writing a report) can help a worker stay on track. Finally, because patients with MCI typically report feeling like it is harder to do things, breaks may be helpful in maintaining a feeling of cognitive efficiency. Likewise, a flexible work schedule such as part-time employment may be beneficial in allowing an individual to work as long as possible. Additional recommendations are provided in Table 31.1 at the end of this chapter.

31.8 Summary and Recommendations

Mild cognitive disorders, presently classified in the DSM-5 as Mild Neurocognitive Disorders (APA 2013), are highly prevalent in workplace environments and are often overlooked. In this chapter, we have described a number of common conditions that can impact occupational function through subtle effects upon cognitive function. These conditions can affect workers of any age or stage of employment, from those who are just beginning their careers to those who are preparing for retirement. Each of these conditions, summarized below, is associated with specific features that may be important to consider in maximizing an individual's return to work or their future work performance.

Although **attention-deficit/hyperactivity disorder** (**ADHD**) was previously considered a disorder of childhood, we now know that effects of ADHD may persist well into adulthood. Adults with ADHD often experience a number of difficulties related to *attention* and *executive functions* that may be misperceived as "laziness" or irresponsibility. To the contrary, individuals with ADHD can become very frustrated with the difficulties that they may experience in the workplace despite high levels of intelligence, education, training, or skills. Indeed, the distractions, sedentary activities, and self-direction required in many modern workplaces may be a poor fit for many individuals with ADHD. As a result, ADHD can have significant impacts upon workplace functioning, including lower rates of employment, lower ratings of work performance, higher accident rates, less job stability, and career underachievement relative to others with similar intellectual abilities and educational backgrounds. Individuals with ADHD can benefit from an assessment of symptoms and cognitive abilities, as well as career counseling in order to identify jobs that are well tailored to individual

Table 31.1 Recommendations, accommodations, and interventions for mild cognitive disorders

General
(Applicable to a wide variety of symptoms and cognitive difficulties in mild cognitive disorders)
• Many **laws**, **regulations**, **and policies** regarding accommodations for cognitive disabilities vary by state and organization. Workers can consult with a local disability specialist to determine benefits, drawbacks, and eligibility for obtaining formal accommodations.
• An **assessment** of cognitive abilities and other factors that can impact cognition can be helpful for developing individual and targeted recommendations and accommodations to enhance workplace functioning.
• Workers experiencing cognitive difficulties with known causes should be provided with **education** about the implications of their condition. This should include **expectation management** to help prevent potentially harmful misconceptions from becoming established.
• **Facilitating adherence to medical treatment regimens** is important to help prevent further decline for many conditions. Additionally, many medications have side effects that can affect cognitive function. Prescribing providers should be consulted in order to balance the goals of treatment with potential side effects in a work environment. It is also important to ensure that workers have time to address medical needs in their workplace.
• **Flexible work schedules** are suggested when possible. For instance, this may include allowing workers to schedule more challenging activities at times of day when they feel most alert and energized.
• **Graded resumption of work** hours and activities will be helpful for workers returning to work following a specific cognitive event, such as a brain injury.
• **Collaborative work environments** can be beneficial. Working with other individuals who have complementary skills can help to minimize the impact of individual weaknesses.
• **Consulting with a supportive mentor or supervisor** is suggested to help workers obtain feedback on work activities and more effectively manage their responsibilities. Mentors can assist with prioritization and provide the oversight that is often needed to stay on track.
Attention and executive functions (e.g., difficulty concentrating, poor initiation, disorganization, impulsivity)
• Referral to a **cognitive rehabilitation** specialist can help to strengthen attention, as well as learn to effectively apply compensatory strategies (such as those described below).
• **Individualized reward systems** can be helpful to reduce procrastination and improve task completion at work. For instance, it is helpful to do tasks that are least interesting first, as enjoyable activities are more inherently motivating and more likely to be completed.
• **Planning ahead** can reduce the chances that workers will be late to work or forget needed items. Reviewing the next day's schedule and preparing outfits, meals, and personal and work items each night can increase the efficiency of the morning routine.
• **Breaking complex or long-term goals into multiple smaller tasks** is advised. This can make the workload more manageable, which will reduce the chances of workers feeling overwhelmed, improve task initiation, and help with planning and sequencing activities to ensure that important steps are not overlooked. Advanced task planning and organization can be made more concrete by writing down the steps and checking each off as it is completed, which will also create a sense of satisfaction and productivity.
• **Structuring the workday** can enhance workplace efficiency. Workers who are easily distracted and take longer to reorient to tasks will benefit from chunking their activities to avoid disrupting work flow. For instance, having two specific times each day to check and respond to emails will help to consolidate this potentially time-consuming activity. Similarly, when possible, avoiding answering phone calls in the moment and responding to voicemails during specifically determined times of day can also reduce distractions. If a worker is frequently interrupted by coworkers' visits, having specific times of day for consultations can reduce the disruption.
• **Reducing multitasking** is recommended, to the extent possible. Focusing on one task at a time and completing individual activities before moving on to something new will improve efficiency and task completion.
• **Keeping a well-organized workspace** will improve efficiency and reduce distractions. Workers should be assisted with maintaining a simple and clear system for storing papers, tools, or computer documents in order to avoid clutter. Once workers have finished using a particular paper or item, they should put it away to avoid distraction and indicate to themselves that the associated activity has been completed.
• **Reducing noise and other distractions** in the environment is helpful for focus and attention. Creating a quiet work area or, if this is not feasible, ear plugs are suggested.

(continued)

Table 31.1 (continued)

• **Using verbal mediation** by talking aloud through a task may help to increase focus and attention to details, so long as it does not disrupt coworkers in one's work environment.
• **Taking notes during meetings** or trainings can be helpful to maintain stimulation and focus.
• **Taking breaks** is helpful for maintaining attention and making transitions. Doing some kind of motor activity during breaks such as stretching or taking a brief walk can help to increase energy and alertness during the workday. Scheduling these breaks between different tasks can assist with making the shift from doing one type of activity to another.
• **Avoiding rushing** and building in time to review and recheck work will reduce errors and enhance attention to key details.
• **Applying strategies to delay responses** can be helpful for impulsivity or emotional reactivity. Leaving a situation, waiting for others to finish talking, or taking time to pause and think in the moment is suggested (e.g., mentally counting to ten, taking several deep breaths before responding).
• **Monitoring time spent** doing various activities with a timer can help with self- and task-monitoring. Workers can determine how much time will or should be spent on one particular task and use a clock or timer to help stay on track.
Processing speed (e.g., slowed thinking or movement)
• **Planning in advance for tasks to take longer** and reducing work responsibilities (as needed) will help to reduce the frustration workers and coworkers may experience when expectations differ from actual outcome.
• **Adding time buffers** into one's schedule can prevent workers from getting behind or overwhelmed if tasks take somewhat longer than initially anticipated.
• **Timing common activities** can help workers objectively determine how much time is typically required to complete those tasks in order to plan and schedule appropriately.
• **Providing status updates** to supervisors will aid communication regarding pace and help to modify expectations as needed.
• **Avoiding multitasking** can increase efficiency and improve task completion.
Memory (e.g., forgetfulness, difficulty learning new information)
• Referral to a **cognitive remediation specialist** can be helpful in applying the below and other strategies to compensate for memory difficulties on the job.
• Workers with memory problems will benefit from **writing down** all appointments, upcoming deadlines, and tasks that need to be completed. These workers may also need to write down important details from meetings or even casual conversations with coworkers to ensure that essential material is remembered. Consistently storing this information in a single planner/calendar, either written or electronic, is suggested to avoid having to track multiple different booklets or notes that can be misplaced or forgotten.
• When recording meetings/appointments in one's planner/calendar, the worker would benefit from including not only the date, time, and place of the meeting, but also any important information he or she needs to bring to the meeting.
• When integrating the "to-do" list with one's planner/calendar, it is helpful to break down listed tasks into those that will be completed that day, week, and month, and check each off as it is completed. Continually reviewing and updating the list is important for effectiveness of this method of compensation.
• **Maintaining a consistent**, **routine schedule** is helpful for memory difficulties. This means doing repeated activities at the same time each day or week (e.g., filing weekly status reports every Friday afternoon; checking inventory at 9 am each morning).
• Always **returning frequently used objects to the same place** helps to ensure easy retrieval.
• **Visual reminders** can serve as a cue for workers with memory problems. They can display their schedules or calendars in an obvious location and review it at the beginning of the workday to help anticipate and plan for upcoming activities. It is also useful to create a to-do list for the day, which is kept in plain view and regularly updated.
• **Auditory cues** (alarms) can be set to generate a reminder of a meeting time or important tasks. In many cases, these cues can be easily integrated into electronic schedules and to-do lists.
• **Repeated exposure** to important information can be helpful for learning and memory. Workers can request that important instructions be repeated for clarity, or they may record meetings for later review.
• **Learning information through multiple modalities** (e.g., hearing, seeing, hands-on doing) can increase engagement and learning, and create more cues for recalling the material.

interests and provide an optimal balance of stimulation, structure, flexibility, and constructive feedback to help keep them on track. Many individuals with ADHD benefit from medication treatment, as well as psychoeducation and ADHD-specific cognitive-behavioral therapy (CBT). Personal/executive coaching may also be helpful.

Mild traumatic brain injury (mild TBI or "concussion") is also highly prevalent at all ages, and can be associated with significant symptoms and cognitive deficits, particularly in the acute phase of injury. For a minority of individuals, symptoms such as fatigue, headaches, and "mental fogginess" and subtle changes in *attention*, *processing speed*, *executive functions*, or *memory* may persist, causing difficulties with successful return to work and other important functional activities. A number of factors such as depression, ongoing litigation, older age, and lower levels of occupational attainment are related to poorer vocational outcomes after mild TBI. Health care providers and occupational specialists can assist individuals after mild TBI by providing accurate information about typical recovery from mild TBI, an understanding of other factors that may impact typical recovery rates, and supporting graduated return to work as needed. Referrals to mild TBI specialists may be useful to provide short-term symptom relief to increase functioning until symptoms have fully resolved, and/or to obtain information about the patient's neuropsychological profile in order to guide further treatments or workplace accommodations.

HIV/AIDS can be associated with cognitive decline and may have negative impacts upon workplace functioning. Impairments in *attention*, *processing speed*, *executive functions*, or *memory*, and symptoms such as apathy and fatigue become increasingly common with the progression of illness. These problems can be mitigated by proper adherence to antiretroviral medication regimens. Health care providers and occupational specialists can assist individuals with HIV/AIDS by educating these patients about common symptoms that are relevant to work performance, training patients on medication adherence strategies, and structuring work duties and environment to enhance potential medication adherence and minimize the impact of cognitive and neuropsychiatric symptoms. Many patients will also benefit from a referral to a neuropsychologist or other specialist to obtain comprehensive information about cognitive and neuropsychiatric symptoms for further planning of medical treatments, compensatory strategies, and accommodations to maximize occupational function.

Age-related **Mild Cognitive Impairment** (**MCI**) is a diagnosis used to represent cognitive decline that is greater than would be expected based on normal aging, but is not so severe as to be considered "dementia." As the average age of retirement increases, the prevalence of MCI in the workplace is likely to continue to increase as well. While individuals with MCI generally function well in their day-to-day activities, they can have difficulties with more complex tasks such as multitasking, managing financial/business documents, planning events, remembering the details of conversations, and remembering important events. Most commonly, these difficulties reflect problems with *memory*, *executive functioning*, and/or *processing speed*. The cause of the cognitive decline in MCI will impact the decision to retire or to continue working. Work-related accommodations relevant to mild cognitive difficulties as reviewed in this chapter are likely to enhance the abilities of individuals with MCI who choose to continue working.

A number of **additional conditions**, such as multiple sclerosis, toxic exposure, anoxia, hydrocephalus, and epilepsy (to name a few) can cause mild cognitive deficits but were not discussed within this chapter. However, we believe that consideration of the conditions that were discussed in this chapter provides a valuable framework for addressing many of the work-related concerns and challenges of other conditions as well. Ideally, providers who seek to assist with improving workplace functioning will have an opportunity to review research that is specific and relevant to an individual's condition in order to provide evidence-based interventions and recommendations. Unfortunately, much of this important research has yet to be completed. Until these scientific gaps have been addressed, recommendations must be based upon research that is available on related topics, and the clinical wisdom that has been collected by those familiar with workplace issues in these groups. Many forms of mild cognitive dysfunction are shared across disorders, and similar recommendations may be appropriate for assisting with these problems. For example, problems with attention, executive functions, and memory are relatively common among all of the conditions discussed in this chapter (ADHD, mild TBI, HIV/AIDS, and age-related MCI), and similar recommendations for those difficulties are appropriate for many of these individuals. Additionally, a number of recommendations can be made regardless of the particular form of mild cognitive dysfunction to buffer the impact of difficulties that may be experienced, and to obtain additional information about what is useful in order to refine recommendations more specifically.

In many cases of mild cognitive impairment, the first step may be to complete an **assessment**. This will provide an understanding of the types and severity of cognitive difficulties a person is experiencing, as well as possible causes. In addition, an assessment can identify a host of coexisting emotional difficulties such as depression and anxiety that may be interfering with successful functioning. The process may begin with an individual's primary care provider, a specialist such as neurologist, psychiatrist, or neuropsychologist, or employee services or other occupational services if available.

Enhancing occupational functioning can be approached from multiple angles. The patient's individualized treatment plan should include **education** about the disorder causing the cognitive difficulties, with attention to the natural course of the cognitive difficulties. As discussed, in some conditions cognitive symptoms are expected to improve over time (mild TBI), while in others the symptoms may remain somewhat chronic (ADHD, HIV/AIDS) or worsen (dementia). Providing education will enable these individuals to develop realistic expectations and help reach optimal levels of functioning. Some individuals may benefit from **medications** that target either the cognitive impairments, associated medical factors (e.g., headache in mild TBI), and/or possible emotional symptoms (e.g., depression, anxiety). **Psychotherapy** (such as Cognitive-Behavioral Therapy) may help treat coexisting psychiatric conditions. Some patients may also benefit from cognitive rehabilitation, occupational training, or coaching to learn strategies to utilize their cognitive strengths and compensate for cognitive weaknesses. Consideration should also be paid to enhancing the **goodness of fit** between the individual's abilities and job demands. Some individuals may also benefit from a graded return to work schedule, particularly after an acute event (such as in mild TBI).

In Table 31.1, we have grouped a number of recommendations that may assist patients or providers in enhancing workplace functioning in the presence of mild cognitive dysfunction. These are organized according to the affected cognitive domain that the recommendation is intended to address, but it is important to recognize that there may be overlap in recommendations for various cognitive difficulties.

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Return to Work for Individuals with Moderate to Severe Brain Injury

32

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32.1 Introduction

Traumatic Brain Injury (TBI) results in a number of cognitive, behavioral, and physical issues that can impact employment. One way to help overcome these barriers is to implement effective vocational interventions. This chapter focuses on ways to assist individuals with moderate to severe TBI with returning to work including using a supported employment approach. We begin by taking a close look at TBI, and problems and complications associated with injury, as well as vocational implications and possible medically oriented treatment strategies. This is followed by a review of return to work models, with a focus on a supported employment approach. We then conclude with some thoughts on future directions.

32.2 Understanding Traumatic Brain Injury

TBI is defined as a violent force or trauma to the head, which can cause localized damage, bleeding, stretched nerve cells, or brain swelling (Mayo Clinic 2008). In the United States alone, approximately 1.7 million TBIs occur every year, resulting in 1,365,000 emergency department visits and 52,000 deaths (Faul et al. 2010). Worldwide, TBI affects an estimated ten million people annually and it is predicted to become a major cause of death and disability by the year 2020 (Hyder et al. 2007). Some of the most frequent causes of TBI worldwide include motor vehicle or traffic accidents, falls, and assault (Faul et al. 2010).

In addition to the initial injury, a TBI often results in complications collectively referred to as "secondary brain injury" (Stahel et al. 2008). Secondary complications such as pneumonia (Hansen et al. 2008), ischemia and edema (Gaetz 2004), seizures (Schierhout and Roberts 2010), and altered consciousness including coma, vegetative and minimally responsive states (Giacino and Zasler 1995) are common and often serious after moderate to severe TBI. Increased mortality rates are seen in TBI patients who experience common complications such as hypoxia, hypotension, and acidosis (Jeremitsky et al. 2003; Stahel et al. 2008). TBI is also associated with increased risk for developing Alzheimer's disease

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(Ikonomovic et al. 2004). Overall, complications resulting from a TBI are associated with worse outcomes for the patient (Jeremitsky et al. 2003).

In general, most TBI patients progress through a pattern of gradual recovery related to severity of injury and beginning when a patient progresses from a comatose to vegetative state, characterized by spontaneous eye opening and sleep-wake cycles without cognitive awareness. Subsequently, patients may progress to a minimally conscious state defined by evidence of self and environmental awareness. Patients then move into the confusional state/posttraumatic amnesia stage (indicated by accurate yes/no communication and the ability to use objects) combined with some amnesia, deficits in attention, and occasionally agitated behavior. The next stage, post-confusional/emerging independence, is characterized by a resolution of posttraumatic amnesia, improving social interaction, achieving independence in daily self-care, and developing independence at home. However, some deficits in awareness, attention, memory, and executive function, and problems with behavioral and emotional regulation often remain (Katz et al. 2007, 2009).

In the final phase of recovery, patients may progress to the social competence/community re-entry stage, marked by the ability to be independent and left alone for 8 h during the day. These individuals may continue their education or return to work, manage their own household, and often develop techniques to deal with residual TBI-related problems. Injury severity plays a significant role in rate of progression and level of impairment for each individual (Katz et al. 2007, 2009).

32.3 Prognosis and Outcomes

Long-term consequences prevalent in individuals who have sustained a TBI often impact cognitive, behavioral, emotional, and sensory functioning. Cognitive deficits can involve impairments in memory and attention (Arciniegas et al. 1999), problem-solving abilities (Rath et al. 2004), and learning (Hillary et al. 2003). Both anomia (Maher and Raymer 2004) and dysarthria (McGhee et al. 2006) can vary from mild to severe after a TBI and create communication problems for the patient. Individuals with TBI may also exhibit problematic behavior such as aggression (Baguley et al. 2006), impulsivity (Berlin et al. 2004), and risk-taking behaviors (Floden et al. 2008). Emotional consequences can include depression (Bombardier et al. 2010), anxiety (Draper et al. 2007), and irritability (Kim et al. 1999). Sensory problems can include dizziness (Chamelian et al. 2004), hearing and visual impairment (Lew et al. 2009), and, rarely, tactile agnosia (Gerstmann 2001). Deficits in cognition, behavior, emotions, and sensory functioning can cause drastic changes in many areas of patients' lives such as close relationships and employment outcomes for years to come.

The course and degree of recovery from TBI varies widely. Researchers have investigated how characteristics of both patient and injury can affect outcomes. Clinical factors such as (1) severity of the injury (Andelic et al. 2009; Anderson et al. 2009, 2011; Cifu et al. 1997; Deutsch et al. 2006; Doctor et al. 2005; Fraser et al. 2006; Holtslag et al. 2007; Parks et al. 2010; Schonberger et al. 2011; Shames et al. 2007), (2) cognitive functioning (Anderson et al. 2011; Devitt et al. 2006; Fleming et al. 1999; Cifu et al. 1997; Holtslag et al. 2007; Ip et al. 1995; O'Connell 2000; Sherer et al. 2002), (3) physical disabilities (Devitt et al. 2006; Greenspan et al. 1996; Holtslag et al. 2007; Schonberger et al. 2011), (4) neuropsychological functioning (Doctor et al. 2005; Fraser et al. 2006; Nybo and Koskiniemi 1999), (5) posttraumatic amnesia (Avesani et al. 2005; Cifu et al. 1997; Fleming et al. 1999; Sherer et al. 2002), (6) loss of consciousness/length of coma (Cifu et al. 1997; Kreutzer et al. 2003; Vanderploeg et al. 2003), and (7) length of hospital stay (Avesani et al. 2005; Fleming et al. 1999; Gary et al. 2009; Holtslag et al. 2007; Keyser-Marcus et al. 2002; Sander et al. 1996; Walker et al. 2006) have been shown to impact outcomes. Scores on the Functional Independence Measure (Cifu et al. 1997; Gary et al. 2009; Greenspan et al. 1996; Walker et al. 2006), Disability Rating Scale (Cifu et al. 1997; Fleming et al. 1999; Gary et al. 2009; Gollaher et al. 1998; Kreutzer et al. 2003;

Ponsford et al. 1995a, b; Testa et al. 2005), and Glasgow Coma Scale (Avesani et al. 2005; Cifu et al. 1997; Fleming et al. 1999; Hammond et al. 2004; Ponsford et al. 1995a, b) have also shown significant impact on post-injury outcomes.

In addition, researchers have identified numerous sociodemographic factors influencing post-injury outcomes including (1) age (Asikainen et al. 1996; Corrigan et al. 2007; Felmingham et al. 2001; Gary et al. 2009; Holtslag et al. 2007; Keyser-Marcus et al. 2002; Kreutzer et al. 2003; Machamer et al. 2005; Nakase-Richardson et al. 2007; Ponsford et al. 1995a, b; Schonberger et al. 2011; Testa et al. 2005; Walker et al. 2006), (2) gender (Bounds et al. 2003; Corrigan et al. 2007; Devitt et al. 2006; Doctor et al. 2005; Fraser et al. 2006; Gary et al. 2009; Parks et al. 2010; Schonberger et al. 2011; Walker et al. 2006), (3) race/ethnicity (Arango-Lasprilla et al. 2008; da Silva Cardoso et al. 2007; Gary et al. 2009; Hammond et al. 2004; Kreutzer et al. 2003; Vanderploeg et al. 2003), (4) marital status (Corrigan et al. 2007; Gary et al. 2009; Greenspan et al. 1996; Kreutzer et al. 2003; Walker et al. 2006), (5) pre-injury employment (Felmingham et al. 2001; Fleming et al. 1999; Gary et al. 2009; Gollaher et al. 1998; Keyser-Marcus et al. 2002; Machamer et al. 2005; Sherer et al. 2002; Schonberger et al. 2011; Walker et al. 2006), (6) pre-injury educational level (Asikainen et al. 1996; Deutsch et al. 2006; Doctor et al. 2005; Gary et al. 2009; Greenspan et al. 1996; Gollaher et al. 1998; Keyser-Marcus et al. 2002; Kreutzer et al. 2003; Nakase-Richardson et al. 2007; Schonberger et al. 2011; Sherer et al. 1999, 2002; Walker et al. 2006; Vanderploeg et al. 2003), and (7) substance use/abuse (Fraser et al. 2006; Jorge et al. 2005; Sherer et al. 1999).

32.3.1 Predictors of Employment Outcomes

32.3.1.1 Age

Several studies have found that age is an important predictor of employment outcomes after TBI (Asikainen et al. 1996; Corrigan et al. 2007; Felmingham et al. 2001; Gary et al. 2009; Holtslag et al. 2007; Keyser-Marcus et al. 2002; Kreutzer et al. 2003; Machamer et al. 2005; Nakase-Richardson et al. 2007; Ponsford et al. 1995a, b; Schonberger et al. 2011; Testa et al. 2005; Walker et al. 2006). In a study examining the effect of age on TBI outcomes, Testa et al. (2005) divided 195 patients with TBI at 1–2 years post-injury into two age groups: 18–49 years of age and 50–89 years of age. Findings indicated that older individuals with TBI were more likely to be unemployed or retired at follow-up. Schonberger et al. (2011) also assessed outcomes at 1 year post-injury in 949 individuals with moderate to severe TBI. Results indicated that age was a direct predictor of employment outcome, with older individuals reporting lower rates of employment.

32.3.1.2 Gender

Gender can also act as a predictor for future employment among individuals with TBI (Bounds et al. 2003; Corrigan et al. 2007; Devitt et al. 2006; Doctor et al. 2005; Fraser et al. 2006; Gary et al. 2009; Parks et al. 2010; Schonberger et al. 2011; Walker et al. 2006). For example, Corrigan et al. (2007) examined the influence of gender on employment outcomes at 1 year post-injury in a sample of 3444 individuals with TBI (2487 men, 957 women). The women in this study were more likely to decrease hours or stop working after a TBI, except among those aged 55–64 years; in that same age group, men were more likely to stop working. Women also were more likely to have better employment outcomes as they grew older. Bounds et al. (2003) also assessed the effect of gender on employment outcomes in a sample of 78 individuals (55 male, 23 female) with TBI at approximately 9 years post-injury who received services from a state Vocational Rehabilitation Division (VRD). In this sample, only 4.4 % of women were successfully employed through VRD services, in contrast to 23.6 % of men.

32.3.1.3 Race/Ethnicity

Several studies have found that race/ethnicity can play a role in determining employment outcomes (Arango-Lasprilla et al. 2008; da Silva Cardoso et al. 2007; Gary et al. 2009; Hammond et al. 2004; Kreutzer et al. 2003; Vanderploeg et al. 2003). Da Silva Cardoso et al.'s (2007) study of disparities in employment outcomes in a sample of 5831 TBI survivors (5394 European Americans, 437 Hispanic) receiving vocational rehabilitation services after 30–32 months spent in rehabilitation revealed that European Americans were 1.27 times more likely to be competitively employed than Hispanics after receiving vocational rehabilitation services. In Gary et al.'s (2009) study, racial differences in competitive employment were retrospectively examined at 1, 2, and 5 years post-injury in a population of 615 African Americans and 1407 Caucasians with TBI. Although both groups reported employment problems, the odds of not being competitively employed at all follow-up years were significantly greater for African Americans than Caucasians.

32.3.1.4 Marital Status

Patients may also fare better at achieving employment post-injury depending on their marital status (Corrigan et al. 2007; Gary et al. 2009; Greenspan et al. 1996; Kreutzer et al. 2003; Walker et al. 2006). Greenspan et al. (1996) followed up 343 TBI survivors at 12-months post-discharge, with results indicating that unmarried individuals were more likely to be unemployed than those who were married. Corrigan et al. (2007) also found that marital status had a significant impact on individuals with TBI at 1 year post-injury. Married women were more likely to reduce hours or stop working after injury, while divorced women were more likely to stop working compared to divorced men.

32.3.1.5 Pre-injury Employment

Pre-injury employment can act as a predictor of future employment (Felmingham et al. 2001; Fleming et al. 1999; Gary et al. 2009; Gollaher et al. 1998; Keyser-Marcus et al. 2002; Machamer et al. 2005; Schonberger et al. 2011; Sherer et al. 2002; Walker et al. 2006). Machamer et al. (2005) followed up 165 individuals with mild to severe TBI at 3, 4, and 5 years post-injury with results showing that those individuals with the highest pre-injury earnings and stable pre-injury work history were more likely to have positive post-injury employment outcomes. Felmingham et al. (2001) also examined a sample of 55 individuals with TBI at 2 years post-injury with results indicating that individuals employed either pre-injury or at 6 months post-discharge were significantly more likely to be employed at the 2-year follow-up.

32.3.1.6 Education

Studies have also found that pre-injury educational level may help to determine employment outcomes (Asikainen et al. 1996; Deutsch et al. 2006; Doctor et al. 2005; Gary et al. 2009; Greenspan et al. 1996; Gollaher et al. 1998; Keyser-Marcus et al. 2002; Kreutzer et al. 2003; Nakase-Richardson et al. 2007; Schonberger et al. 2011; Sherer et al. 1999, 2002; Vanderploeg et al. 2003; Walker et al. 2006). Asikainen et al. (1996) followed up 508 TBI patients at an average of 12 years post-injury and found that patients with lower levels of pre-injury education had worse employment outcomes. Nakase-Richardson et al.'s (2007) prospective study of 171 individuals with TBI found pre-injury education to be a significant predictor of employment outcomes, with lower levels of education predicting less employment at 1 year post-injury.

32.3.1.7 Substance Abuse

Pre- and post-injury substance use/abuse has been associated with employment outcomes of TBI survivors (Fraser et al. 2006; Jorge et al. 2005; Sherer et al. 1999). For example, Jorge et al. (2005) examined 158 patients with TBI at baseline and at 3, 6, and 12 months after the injury. Fifty-five patients had been dependent on or abused alcohol the year before injury, and 18 patients were dependent on or abused alcohol the year following injury. Individuals who resumed alcohol abuse post-injury demonstrated impaired performance in executive tasks, were more likely to develop mood disorders, and in turn, could have increased difficulty resuming a productive life. Sherer et al. (1999) also assessed 76 patients with TBI at least 3 months after discharge and found that pre-injury substance use was a significant predictor of long-term employment outcomes, with subjects with no substance use history being eight times more likely to be employed than subjects with substance abuse history.

32.3.1.8 Injury-Related Factors

A number of clinical indicators can be used as predictors for post-injury employment outcome. For instance, injury severity (Andelic et al. 2009; Anderson et al. 2009, 2011; Cifu et al. 1997; Fraser et al. 2006; Holtslag et al. 2007; Parks et al. 2010; Deutsch et al. 2006; Doctor et al. 2005; Schonberger et al. 2011; Shames et al. 2007) is associated with employment after the injury. Anderson et al. (2009) assessed 124 survivors of mild, moderate, and severe childhood TBI approximately 13.7 years post-injury for long-term outcomes. Results indicated that injury severity was a very strong predictor of employment, with severe TBI survivors reporting more unemployment than either mild or moderate TBI survivors. Andelic et al. (2009) also examined long-term outcomes in 62 moderate to severe TBI survivors at 10 years post-injury. Analysis revealed that employment status was associated with initial injury severity. At 10 years post-injury, only 20 % of severe TBI survivors were working compared to 69 % of survivors of moderate TBI.

Other indicators of injury severity, such as loss of consciousness and length of coma (LOC), may be used as predictors for employment outcomes post-TBI (Cifu et al. 1997; Kreutzer et al. 2003; Vanderploeg et al. 2003). Vanderploeg et al. (2003) assessed factors associated with employment outcomes in 626 Army veterans with mild head injuries, approximately 8 years post-injury. Results indicated that among participants with some college education, a history of LOC was associated with lower employment rates. Glasgow Coma Scale (GCS) scores can also be used to help predict employment outcomes post-injury (Avesani et al. 2005; Cifu et al. 1997; Fleming et al. 1999; Hammond et al. 2004; Ponsford et al. 1995a, b). Hammond et al. (2004) examined 301 individuals with TBI at both 1 and 5 years post-injury to determine predictors of employment over time. One specific score (Glasgow Coma Scale Eye Opening score, measured in the emergency department) was predictive of employment outcomes at both 1 and 5 years post-injury. It was calculated that for each one-unit improvement on the Glasgow Coma Scale Eye Opening score, the odds of employment became 1.8 times worse. Ponsford et al. (1995a, b) also found that GCS scores contributed to a group of three variables, which accurately predicted employment in 74 % of patient cases.

32.3.1.9 Cognitive and Neuropsychological Functioning

Cognitive functioning early in recovery is a useful predictor for employment and productivity outcomes at follow-up (Anderson et al. 2011; Cifu et al. 1997; Devitt et al. 2006; Fleming et al. 1999; Holtslag et al. 2007; Ip et al. 1995; O'Connell 2000; Sherer et al. 2002). For example, Fleming et al. (1999) investigated vocational outcome 2–5 years post-injury in a sample of 209 individuals with TBI, with results indicating that individuals with better cognitive functioning were more productive at follow-up and more likely to have returned to work. Sherer et al. (2002) also assessed productivity in 388 adults with TBI at 12 months post-injury and found that early cognitive status, measured during inpatient stay, contributed significantly to prediction of productivity at follow-up, with better cognitive status associated with a higher likelihood of post-injury productivity.

Neuropsychological functioning has also been used as a predictor to determine employment outcomes of individuals with TBI (Doctor et al. 2005; Fraser et al. 2006; Nybo and Koskiniemi 1999). In Nybo and Koskiniemi's (1999) study, 33 children between the ages of two and seven who had sustained a severe TBI were followed until the age of 18 and evaluated for neurological, neuropsychological, and psychological factors. Better performance on neuropsychological tests evaluating speed, executive, and memory functions was significantly associated with better employment outcomes.

In addition, some studies have found that post-injury behavioral functioning may predict employment status (Cifu et al. 1997; Devitt et al. 2006; McCrimmon and Oddy 2006; Simpson and

Schmitter-Edgecombe 2002). Simpson and Schmitter-Edgecombe (2002) assessed behavioral functioning and employment status in 61 individuals with TBI approximately 10 years post-injury. Results indicated that two measures of frontal lobe function (in the orbitofrontal area and dorsolateral frontal lobe) were able to differentiate between individuals who needed modified employment post-injury and individuals who had been able to return to their previous employment level. Sherer et al. (1999) also found that the need for physical and behavioral supervision negatively affected employment outcomes.

Other clinical factors that may act as predictors for employment outcomes after TBI include self-awareness (Ownsworth et al. 2006; Shames et al. 2007; Sherer et al. 1998a, b), post-injury mood disorders (Jorge et al. 2005), post-injury confusion (Nakase-Richardson et al. 2007), post-injury psychological distress (Felmingham et al. 2001), and poor social interaction (Ruffolo et al. 1999).

32.3.1.10 Physical Functioning

Physical disabilities resulting from a TBI can impact employment outcomes among survivors (Devitt et al. 2006; Greenspan et al. 1996; Holtslag et al. 2007; Schonberger et al. 2011). Devitt et al. (2006) examined predictors of employment outcomes in 306 adults with moderate to severe TBI at 14 years post-injury. Post-injury physical deficits were significant independent predictors of poor occupational outcomes.

Functional Independence Measure (FIM) scores are used often in TBI outcomes research and can be used as predictors of future employment outcomes (Cifu et al. 1997; Gary et al. 2009; Greenspan et al. 1996; Walker et al. 2006). Greenspan et al. (1996) followed up 343 TBI survivors at 12-months post-discharge to determine factors that affect employment outcomes. Results indicated that individuals who had failed to return to work due to their injuries were far more likely to report modified independence or dependence on the FIM measure.

Disability Rating Scale scores (DRS) can also be an indicator of occupational outcomes (Cifu et al. 1997; Fleming et al. 1999; Gary et al. 2009; Gollaher et al. 1998; Kreutzer et al. 2003; Ponsford et al. 1995a, b; Testa et al. 2005). For instance, Ponsford et al. (1995a, b) investigated potential predictors of employment status 2 years post-injury in a sample of 74 TBI patients with a pre-injury employment history. The analysis revealed that DRS scores were the greatest contributor to a group of three variables, which accurately predicted employment in 74 % of the patient cases. Gollaher et al. (1998) carried out a similar study in a sample of 99 individuals with TBI at 1, 2, or 3 years post-injury, with discharge DRS scores significantly correlated with employment outcomes.

32.3.1.11 Hospital-Related Factors

Posttraumatic amnesia (PTA) is often measured in patients with TBI and can be used as a predictor of employment outcomes (Avesani et al. 2005; Cifu et al. 1997; Fleming et al. 1999; Sherer et al. 2002). Avesani et al. (2005) retrospectively examined data for 353 individuals with severe brain injury. Evaluations of the patients were completed at 2 weeks after admission; at the end of intensive rehabilitation; and at 6, 12, 24, 36, and 60 months post-injury. Results indicated that shorter mean PTA duration was associated with greater likelihood of employment at 6 and 12 months post-injury. Cifu et al. (1997) assessed 49 individuals with TBI who were employed and 83 individuals with TBI who were unemployed at 1 year post-injury, to examine the influence of injury characteristics on employment outcomes. Individuals with TBI who were unemployed at 1 year post-injury had significantly longer mean length of PTA than those who were employed.

Length of hospital and/or rehabilitation stay after injury (LOS) can also be a useful variable for predicting employment post-injury (Avesani et al. 2005; Fleming et al. 1999; Gary et al. 2009; Holtslag et al. 2007; Keyser-Marcus et al. 2002; Sander et al. 1996; Walker et al. 2006). For example, Sander et al. (1996) studied 322 individuals with TBI who were at least 3 years post-injury. Results revealed that unemployed TBI survivors had longer hospital stays than employed survivors at multiple follow-up intervals. Avesani et al. (2005) also revealed that shorter inpatient rehabilitation length of stay (LOS) was significantly associated with higher rates of employment at 6 and 12 months post-injury.

32.3.1.12 Cognitive and Behavioral Problems

The profound mental status changes and cognitive impairments of the acute phase of TBI rehabilitation are less common among patients in the late phase of recovery (e.g., those who are attempting return to work). However, patients with moderate or severe traumatic brain injury will often experience some degree of chronic cognitive and neurobehavioral impairment, which is associated with low rates of vocational re-entry success (Rappaport et al. 1989; Witol et al. 1996). Severity of injury does not predict the incidence of cognitive behavioral deficits, which are probably most common among patients with mild TBI (Levin and Grossman 1978). Patients may have significant impairments of arousal and attention, fatigue, insomnia, memory impairment, decreased cognition, behavioral and emotional problems, such as agitation and depression, as well as decreased awareness and insight regarding these deficits (Eslinger et al. 2007). Many of these problems have similar symptomatology, as well as overlapping with the effects of drugs commonly used for treatment. Careful consideration of these issues helps to develop an effective treatment plan.

Neuropsychological assessment is a critical component of cognitive and neurobehavioral evaluation in patients with TBI (Barth et al. 2003). Neuropsychological evaluation is probably most notable for the batteries of tests providing quantitative assessment of cognitive domains along with behavioral observation and psychological interview of the patient (and family members). Behavioral observations can also be structured in real world settings, which may be especially useful for vocational situations (Whyte 1992). In the context of brain injury treatment, the neuropsychologist participates in the development of tailored behavioral plans, psychotherapy for patients and caregivers, and troubleshooting issues that may arise with community integration and return to work (Prigatano 1991). Cognitive and neurobehavioral evaluations should not rely exclusively on neuropsychological test batteries but should ideally incorporate functional and observational assessments by all members of the interdisciplinary rehab treatment team.

Among the hallmarks of brain injury, neuroanatomically, is damage to the frontal and temporal poles of the brain. Impairments of executive function and learning and memory commonly result from injury to these areas, respectively (McDonald et al. 2002). McAllister (2007) defines executive function as comprising three domains as follows: higher order cognitive function (e.g., problem solving and mental flexibility), social comportment (e.g., self-monitoring, appropriate social behavior), and motivational/reward-related behavior (e.g., planning, initiation, sequencing of goal-directed behaviors). Patients with deficits of executive function will exhibit difficulty with planning and strategizing tasks, poor initiation of goal-directed behaviors, difficulty modulating their responses to environmental or internal stimuli, impaired social judgment, and socially disinhibited behaviors (e.g., lustful, aggressive, or awkward). The implications for challenging barriers to success in a work environment are obvious. Executive dysfunction can be among the most persistent neurobehavioral sequelae of TBI and is associated with poor vocational outcomes even years after injury (Cicerone et al. 2011; Nybo and Koskiniemi 1999).

Assessment involves obtaining available information about the patient's pre-morbid baseline from family members as well as educational and vocational histories (McAllister 2007). Formal neuropsychological testing can also be useful to assess mental flexibility and divided attention, which have been shown to be sensitive to deficits in executive function (Brooks et al. 1999). The treatment approach should be multidisciplinary and focus on transition from the highly structured brain injury clinic environment to real world situations in which patients must ultimately succeed. Cognitive rehabilitation is an effective method for addressing deficits of attention/concentration, memory, and executive function and consists of helping patients to recognize impairments and utilize compensatory strategies (e.g., memory logs and self-monitoring) to improve function by exploiting relative strengths to overcome cognitive weaknesses (Cicerone et al. 2000). Cognitive rehabilitation efforts seem to be most successful when integrated with interventions that also address emotional well-being (Mateer et al. 2005).

Damage to the frontal or temporal lobes of the brain almost always leads to some degree of chronic learning and memory impairment in patients with moderate or severe brain injury. These impairments are believed to be the result of damage to the hippocampus, though they might also result from impaired attention, such that patients cannot effectively attend to appropriate stimuli in order to encode memory (Bigler et al. 2002; Nissen 1986). Memory complaints both patients and their family members are very common in the chronic phase of TBI recovery. TBI patients attempting vocational re-entry have the most difficulty with prospective memory—remembering to do something in the future, which affects their ability to adhere to schedules or complete work requiring a series of timed events (e.g., such as preparing food or remembering to turn a stove off after use). The Rivermead Behavioral Memory Test, a functional measure of prospective memory, can be used to monitor improvements in memory during intervention (Wilson et al. 1985). Cognitive prostheses such as smartphones or PDA with alarm systems and calendar functions may also be helpful (Lynch 1995). Donepezil, used to treat memory deficits in patients with dementia, may also be effective for memory impairment in TBI (Masanic et al. 2001). Methylphenidate might also be useful where deficits of attention or arousal are believed to underlie the memory impairment.

Decreased insight into their deficits often underlies and complicates patients' other cognitive sequelae of brain injury. This is important for vocational re-entry because these patients are less able to detect and correct errors they make during tasks (Hart et al. 1998; O'Keefe et al. 2004). Moreover, patients who lack insight into their injuries are less motivated to acknowledge or address them and may be resistant to attempts by therapists or other caregivers to do so (Lam et al. 1998). Increased impairment of self-awareness correlates negatively with employment outcomes (Sherer et al. 1998a). The Awareness Questionnaire (AQ) can be used to assess a patient's insight into his/her disability and takes into account perceptions of the patient, a family member, and a professional member of the treatment team (Sherer et al. 1998b). Treatment typically focuses on education about the nature of their deficits as well as experiential opportunities for debriefing following a failed therapeutic task.

Hypoarousal and hypoattention are common after the brain injury. Arousal is defined as an individual's response to environmental stimuli. Attention is an individual's selective and sustained focus on (external or internal) stimuli (Whyte et al. 2008). Hypoarousal may be the problem when a patient is unable to stay alert and focused despite adequate stimulation and in the absence of medical causes (e.g., infection, insomnia, medication side effect). Hypoattention is characterized by an inability to attend to or maintain focus on stimuli (Cifu et al. 1996) as well as being unable to switch, or divide attention, between tasks (Park et al. 1999). They are at risk of poor work performance and may also present safety risks. Treatment approach should include a focus on reduction of ambient distractions in the workspace, and simplified/tailored work duties and environments.

Frequent review and practice of work tasks may be helpful for patients who are performing relatively simple duties. If a medical cause has been excluded and symptoms are resistant to conservative management, a neurostimulant medication may be appropriate. Methylphenidate has been demonstrated to be effective in the treatment of hypoarousal. Whyte et al. (2004) demonstrated in a randomized, controlled trial that methylphenidate improved patients' cognitive speed as well as caregivers' ratings of patients' attentiveness. Other medications that are used include amantadine, bromocriptine, and SSRIs (Cardenas and McLean 1992). TBI patients may also exhibit problems of decreased initiation (abulia), understanding the task to be completed but unable to generate the behavior. Intervention is similar to that described above. Additionally, these patients may benefit from a closely structured work environment with cues for each step of a task, provided in written, pictorial, or spoken (pre-recorded or "over-the-shoulder" supervision) format. There is also growing literature regarding use of electronic devices such as smartphones to assist in this manner (de Joode et al. 2010).

The term "agitation" is used in the TBI literature to encompass a number of phenomena of increased psychomotor activity, including emotional lability, restlessness, irritability, anger, or aggression (Brooke et al. 1992). Although agitation is a predominant feature of the acute TBI recovery phase (Sandel and Mysiw 1996), it appears as a chronic problem in approximately 5 % of patients, often presenting as increased irritability, low frustration tolerance, and easy anger (Gervasio and Matthies 1995). To some degree, these symptoms may represent underlying depression as discussed above, but they might also result directly from frontal lobe injury common in TBI. Individuals with agitation may have difficulty functioning in more stressful work environments, and may be at risk of isolation and poor integration with coworkers.

Treatment for agitation may involve behavioral management programs, supportive psychotherapy and counseling, training for biofeedback or other relaxation techniques, and medication. Behavior modification programs, led by a neuropsychologist and closely involving treatment team, the patient, and caregivers, can identify situations or contexts in which problem behaviors occur and assist with implementation of a specific behavioral management plan (Whyte et al. 2005). A simplified, tailored work environment may also help to reduce the likelihood of agitation. Redirection, in which the patient's attention is directed away from the stimuli (internal or external) that drive agitation, is commonly used for managing these behavioral problems (Yuen and Benzing 1996). Cognitive behavioral therapy has been used to help TBI patients learn anger management techniques (Medd and Tate 2000). Single- and multi-group therapies are effective in the treatment of agitation following TBI. Family members often bear the brunt of [AU8] neurobehavioral problems and can both benefit from and be trained to participate in behavioral management programs (Carnevale et al. 2006; Kreutzer et al. 1994).

Commonly used medications include atypical antipsychotics, anticonvulsants, beta-blockers, SSRIs, TCAs, amantadine, and trazodone (Kant et al. 1998; Mysiw and Sandel 1997; Wroblewski et al. 1997). Benzodiazepines are generally avoided due to the fact that they can increase confusion and even cause paradoxical agitation (Zafonte et al. 1999).

Depression is among the most common cognitive sequelae of traumatic brain injury, occurring in 27–50 % of patients following TBI (Kreutzer et al. 2001). Depression may result from the altered structural and neurochemical milieu of the injured brain or secondarily from disability challenges and overwhelming life changes that accompany such injury. Depression may also result from, or be exacerbated by, medications used in the treatment of other posttraumatic sequelae (Silver and Yudofsky 1994). It is also important to recognize the significant overlap between vegetative signs of depression and common TBI sequelae such as cognitive impairment, insomnia, and changes in appetite. Irritability, anger, and aggression are common complaints from depressed patients and their caregivers following brain injury, compared to the more classic depression symptoms of sadness, tearfulness, and anhedonia (Seel et al. 2010). Depression can impact a patient's vocational attainment due to cognitive impairment, decreased motivation, and hopelessness. Stable employment is protective for depression among TBI patients (Franulic et al. 2004; Seel et al. 2003).

The Beck Depression Inventory (BDI) and the Neurobehavioral Functioning Inventory (NFI) have both been used to assess depression in TBI populations (Kreutzer et al. 2001; Lykouras et al. 1998). The BDI is a self-report measure of primarily affective and somatic symptoms. The NFI measures several domains including affect, memory/attention, somatization, aggression, communication, suicidality, seizures, and inability to work. Like the AQ described previously, the NFI also considers perceptions of family members or caregivers regarding the patient's symptoms. Both the NFI and BDI have been demonstrated to be valid assessments of depression among TBI patients (Seel and Kreutzer 2003). Specialized supportive psychotherapy is available at most centers specializing in traumatic brain injury care. Cognitive-behavioral and family therapy interventions have been shown to be effective in treating depression, especially for developing adaptive coping strategies (Anson and Ponsford 2006; Backhaus et al. 2010), and in support of effective community re-entry and return to work (Kreutzer et al. 2001). Many patients will require medication, which can include SSRIs, TCAs, anticonvulsant, and even neurostimulants in some cases (Cardenas and McLean 1992; Joseph and Wroblewski 1995), depending on individual depressive symptoms, side effects profile, and interactions with other drugs.

Insomnia is common following TBI and may persist into late phase recovery when patients are attempting vocational re-entry (Castriotta and Murthy 2011; Ouellet et al. 2006). Poor quality sleep can lead to daytime sleepiness/fatigue, mood alterations, and cognitive decompensation, exacerbating existing deficits and reducing workplace performance. Insomnia may result from disrupted sleep-wake cycles caused by TBI (characterized by problems of sleep initiation and maintenance), comorbid illness (e.g., depression/anxiety), and medication side effects such as those seen in patients who take sedating medications during the day or activating medications in the evening (Clinchot et al. 1998; Fichtenberg et al. 2002; Hibbard et al. 1998). Intervention usually begins with sleep hygiene, such as limiting daytime naps, not watching television in bed, removing caffeinated drinks from diet, and rescheduling sedating or activating medications as appropriate (Ouellet and Morin 2004). Medications commonly used in the treatment of insomnia include benzodiazepine sedative hypnotics, non-benzodiazepine sedative hypnotics, or antidepressants such as trazodone or the tetracyclic antidepressant mirtazapine. Careful review of a patient's medication regimen may help to limit polypharmacy by addressing multiple problems with one medication. There is also evidence that cognitive-behavioral therapy can produce more effective long-term sleep improvements than medications alone (Ouellet and Morin 2007; Wu et al. 2006).

Posttraumatic fatigue is a commonly reported symptom following traumatic brain injury, occurring in as many as 46 % of patients in an outpatient brain injury setting 2 years after injury (Kreutzer et al. 2001). It can persist for many years and is a major barrier to patients' quality of life and attempts to return to work or be otherwise productive (Crepeau and Scherzer 1993; Koskinen 1998; Olver et al. 1996). Fatigue, poorly defined in the literature, may be regarded as an impaired ability to initiate or maintain attention to physical or mental tasks (Fellus and Elovic 2007). The Fatigue Impact Scale (FIS) has been used to assess fatigue in TBI populations and includes measures of cognitive, physical, and psychosocial function (Fisk et al. 1994). Fatigue is a symptom that can arise from or exacerbate most cognitive problems described above. Once correctable medical causes have been ruled out, treatment with neurostimulants is typically pursued in refractory cases.

Most of the medications mentioned in this chapter have side effects which may impair cognitive function. Since TBI patients appear to be more susceptible to the side effects of psychotropic medications (Alderfer et al. 2005; Arciniegas and Silver 2006), treatment team awareness of medication side effects and drug interactions is critical for successful therapy.

A general goal of pharmacologic management in patients with TBI is to achieve the simplest effective regimen that manages the patient's symptoms while limiting unwanted side effects. Close monitoring of higher functioning patients who are attempting to return to work is important as they will encounter new cognitive challenges and stressors and may need medication adjustments.

32.3.2 Neurological and Neuromuscular Problems

A number of medical complications which commonly occur with traumatic brain injury might interfere with a patient's ability to obtain and maintain gainful employment. Complications range from the frank physical impairment of limb deformities or disordered motor control to visual perceptual deficits, speech and language impairments, seizures, and headaches. Prompt identification and treatment of these problems can increase patients' quality of life and increase the chances of successful return to work during the late phase of TBI recovery.

32.3.3 Neuromuscular Impairment

32.3.3.1 Muscle Overactivity

Upper motor neuron syndrome (UMNS), or "spasticity," results from damage to the brain or spinal cord and is characterized by various phenomena of muscle overactivity (e.g., spasticity, dystonia) as well as weakness and incoordination (Petropoulou et al. 2007). Estimates of the incidence of spastic symptoms among patients with TBI range from 25 to 75 % (Zafonte et al. 2011). Spasticity causes an imbalance of muscle forces across joints, resulting in disordered motor function, decreased range of motion, and may ultimately lead to fixed joint contracture (Mayer and Herman 2008). Functionally, impairment may range from slowed, laborious movements with poor fine motor control to complete loss of function in one or more limbs. Ambulation may be difficult or impossible. Patients with UMNS will also likely experience difficulty with nearly all ADLs and are at increased risk of pain syndromes.

Treatment of spasticity involves an individualized, multimodality approach that should include occupational and physical therapies in addition to medication. Functional assessment of the patient should precede treatment (Watanabe 2004), including consideration of relative benefits of spasticity (e.g., support for transfers or ambulation conferred by a stiff lower limb) (Hsieh et al. 2008).

Most spasmolytic medications can cause sedation, lethargy, and confusion. Unfortunately, TBI patients are especially susceptible to these side effects (Mayer et al. 2007). Careful identification and treatment of overactive individual muscles or groups of muscles can result in improvement of both passive and active range of motion, reducing the risk of contracture and facilitating functional behaviors in an affected limb. For joints with true contracture that do not respond to active treatments, orthopedic procedures (e.g., muscle/tendon transfer, lengthening or release) can be considered.

Medical management of muscle overactivity may reduce the positive signs of UMNS but therapeutic interventions are critical to maximize range of motion, prevent joint contracture, address weakness and incoordination, and improve functional status. Adaptive equipment such as orthotic devices to maintain and protect joint range will often be required to maintain the gains made with medical treatment and therapies. Ideally, collaboration among the medical treatment team, therapists, and employer could be pursued to facilitate function in a specifically prepared workplace environment to maximize an individual's productivity. For example, a patient with spastic upper limb flexion contractures may—with the aid of targeted medical treatment, adjunctive therapies, and adaptive equipment—be able to function independently and efficiently in an individually tailored workspace that accommodates his/her reduced radius of reach and impairment of fine motor control such as grasp, wrist extension, or forearm supination. Likewise, a workplace with reduced elevations and clear floor space may accommodate a patient who has been restored to functional ambulation or wheelchair level mobility.

32.3.3.2 Heterotopic Ossification

Heterotopic ossification (HO) is the abnormal formation of bone in periarticular soft tissue following trauma, typically among the larger joints. The incidence of HO following TBI is reported from 11 to 20 % (Garland 1991). Among TBI patients, HO occurs most commonly in the hips, followed by the elbows, shoulders, and knees—it often develops along lines of tension in the planes of overactive (i.e., spastic) muscles (Cipriano et al. 2009; Mayer et al. 2007). In the most severe cases, ankylosis of the joint may occur, severely restricting range of motion and threatening nearby neurovascular structures. The etiology of HO is unknown but several risk factors have been identified including prolonged coma, mechanical ventilation, concomitant fractures, surgical treatment of fractures, prolonged immobilization, autonomic dysregulation, and spasticity (van Kampen et al. 2011; Whyte et al. 2005). Presenting symptoms of HO are usually pain, swelling, warmth, tenderness, and decreased range of motion (Seipel et al. 2011).

The best treatment for HO is prevention and usually consists of aggressive range of motion at high risk joints (Linan et al. 2001). Nonsteroidal anti-inflammatory drugs (NSAIDs), bisphosphonates, and radiation therapy have been used both prophylactically and as treatment with mixed results (McNamee et al. 2009; Whyte et al. 2005). In cases where joint ankylosis occurs or there is significant pain or other neurovascular complication from the presence of heterotopic bone, surgery may be performed, though HO may recur (Chalidis et al. 2007). As with spasticity, the primary goal of therapy is to prevent loss of joint range and promote functional use of the involved limb. Workplace issues are also similar to those described for spasticity.

32.3.4 Other Neurologic Impairments

32.3.4.1 Seizures

Posttraumatic epilepsy (PTE) is defined as a recurrent seizure disorder occurring greater than 1 week after injury in patients with TBI and not attributable to another cause (Brain Injury SIG of PM&R 1998). The incidence of PTE among patients with moderate to severe TBI is 4–7 %; for closed head injury, 35–65 % (Yablon and Dostrow 2007). Risk factors for PTE include penetrating brain injury, depressed skull fracture, biparietal contusions or multiple cortical contusions, intracranial hemorrhage, multiple intracranial surgeries, length of posttraumatic amnesia, early seizure (between 24 h and 7 days post-injury), and age (Englander et al. 2003; Whyte et al. 2005). Among patients who develop PTE, more than 50 % will occur within the first year post-injury and 75–80 % will occur by 2 years post-injury. The most common type of posttraumatic seizure is complex partial (brief, focal, with altered cognition). The second most common is simple partial seizure (brief, focal, without alteration of consciousness). A minority of patients will experience generalized tonic-clonic seizures (Yablon 1993).

Patients with risk factors for posttraumatic seizures routinely receive phenytoin for prophylaxis during the first week following injury but there is no evidence to support further seizure prophylaxis beyond that time (Temkin et al. 1990). Patients who present with seizure during the first year post-injury will usually be treated for 3–6 months while long-term seizure prophylaxis is reserved for patients who experience more than one late posttraumatic seizure. Unfortunately, the medications used effectively to treat PTE also cause sedation and can impair cognition (Dodrill and Troupin 1991). There is currently no data regarding the relative effectiveness of newer, possibly less sedating antiepileptic agents (Chang et al. 2003).

Posttraumatic epilepsy is a significant barrier to vocational re-entry and seizure frequency has been found to correlate negatively with employment (Van Hout et al. 1997). The primary vocational challenge for TBI patients with successful prophylaxis of PTE may be the medications' cognitive side effects.

Among otherwise high functioning TBI patients, the presence of PTE may negatively affect employment opportunities due to driving restrictions (no driving for 6–12 months following a seizure), as well as safety concerns when operating heavy machinery and working at heights. Close follow-up with the physician and vocational specialist is important to troubleshoot effects of medications on the patient's success in the workplace.

32.3.4.2 Dizziness and Postural Instability

Dizziness and balance problems are common following moderate to severe TBI, with a reported incidence for dizziness between 20 and 65 % (Duong et al. 2004). Impaired balance is often chronic, present in 26 % of patients at 2 years post-injury in a study by Ponsford et al. (1995a, b) and 34 % of patients 5 years post-injury in another study by Hillier et al. (1997). Studies have demonstrated persistent long-term gait dysfunction following severe brain injury (Olver et al. 1996; Walker and Pickett 2007).

Disorders of balance and dizziness among TBI patients may result from peripheral or central nervous system causes. Peripheral vestibular disorders include benign paroxysmal positional vertigo (BPPV), which is the most common etiology of dizziness in TBI patients. CNS causes of dizziness and imbalance include injury to the brainstem or cerebellum as well as dizziness that occurs as an aura of posttraumatic migraine headache. Dizziness can also be a symptom of psychological distress in these patients (Shepard et al. 2007). Dizziness and balance deficits can be assessed with bedside physical exam maneuvers including the Romberg test and tandem gait (Walker and McDonald 2011; Walker and Pickett 2007). The Berg Balance Scale (Berg et al. 1992) is included in the evaluations of many physical and occupational therapists and can provide somewhat more nuanced, if subjective, information about a patient's balance and risk for falls. If one has access to facilities with appropriate resources, the Test of Sway (Lehman et al. 1990) and computerized posturography testing (CPT) can provide objective assessment of a patient's balance deficits. CPT is relatively sensitive for the identification and quantification of balance problems and may be well suited to tracking changes over time (Pickett et al. 2007).

Medications commonly used for symptom management include antihistamines, benzodiazepines, and phenothiazine antiemetics such as metoclopramide. As described previously, centrally active medications such as these are imperfect treatments for TBI patients since they can cause lethargy and cognitive impairment. Metoclopramide is avoided by many practitioners who treat TBI patients due to the risk of extrapyramidal symptoms with its use (Altmayer et al. 1996). Treatment of balance deficits and dizziness is important because of the significant risk of further injury (recurrent TBI or other trauma) due to falls, especially with TBI patients with impaired safety awareness or more prone to psychological distress from these symptoms. Vestibular and balance rehabilitation therapy (VBRT) is the main approach for management of these symptoms and consists of habituation and movement retraining activities as well as strategies for coping with chronic symptoms. Habituation techniques address the frequent association of symptoms with head movements or postural changes. They attempt to extinguish the brain's response to these noxious stimuli (dizziness) through a stepwise increase in exposure to the movements that precipitate them (Gurr and Moffat 2001). These progressive techniques of VBRT can be tailored to job-specific activities and may even function as an integral part of gradual return to work (Yasuda et al. 2001).

32.3.4.3 Headache and Other Pain

Headache, the most frequently reported symptom following traumatic brain injury, is likely to persist chronically, occurring in 58 % of patients at 5 years in one study (Hillier et al. 1997). Posttraumatic headache (PTHA), defined as headache with onset within 2 weeks of injury (Headache Classification Committee 1998) and persisting for 6 months, is considered chronic, likely permanent, and is associated with poor outcome (Walker et al. 2005; De Benedittis and De Santis 1983). The pathophysiology of headache is poorly understood. The classification of PTHA follows the same system as that used for nontraumatic headache and commonly includes migraine headache (with or without aura), tension headache, or cervicogenic headache. Approximately 26 % of PTHA are classifiable as migraine type (Walker et al. 2005). Medical treatment for chronic migraine headache that occurs most of the days of the week should consist of a prophylactic and a breakthrough medication. There are several medication classes used for headache prophylaxis including beta-blockers, TCAs, anticonvulsants and SSRIs (Pringhsheim et al. 2010). However, caution is advised when using these medications with TBI patients since sedating side effects are possible. Because of the nature of the TBI mechanism of injury, which often includes a violent rotational deceleration of the head, cervicogenic headache is fairly common following TBI. In addition to medication, these headaches will benefit from physical therapy for stretching, strengthening, and heat modalities, as well as supportive psychotherapy for treatment of chronic headache as chronic pain syndromes are associated with significant psychological morbidity (Yamaguchi 1992). Patients with TBI may also suffer from other chronic bodily pain due to polytrauma. PTHA and chronic pain in general have strong psychological components that need to be addressed in all patients as medication alone is unlikely to be effective (Verri et al. 1998).

Supportive psychotherapy, useful for any patient living with a chronic pain syndrome, may be especially helpful for TBI patients. Frequent rest breaks at work or environmental conditions sensitive to migraine auras for example (decrease noise and light) may be appropriate. Patients should be closely monitored during return to work as the increased stress and change in daily patterns may lead to headache exacerbation that requires medication adjustment.

32.3.4.4 Visual Impairment

Due to the complex and distributed nature of visual sensation in the brain, it is often impaired to some degree among patients with moderate to severe TBI. Estimates of the prevalence of visual disturbance following TBI vary from 30 to 85 % depending on the particular condition, with deficits tending to be chronic (Kapoor and Ciuffreda 2002). In a study of 175 patients with TBI (mostly severe) at 2 years post-injury, Ponsford et al. (1995a, b) found that 50 % reported visual impairment, most commonly double or blurred vision. The same group found similar prevalence of visual complaints at 5 years post-injury (Olver et al. 1996). Visual impairment following TBI may occur at any point in the visual process including visual field defects (e.g., complete blindness, peripheral field cut, homonymous hemianopsia, or quadrantonopsia), cranial nerve dysfunction, or disordered perception of visual information. In a review of 188 cases of TBI patients referred for neuro-ophthalmologic evaluation, Sabates et al. (1991) found blurred vision to be the most common visual complaint (46 %) followed by diplopia (30 %). Visual field deficits were present among 35 % of patients and included tunnel vision most commonly (41 %) followed by homonymous hemianopsia (20 %) and homonymous quadrantanopia (9 %). Thirty-three percent of patients had cranial nerve defects. Chronic visual perceptual deficits following brain injury can significantly impair independence. Like seizures, they may prevent patients from attaining the independence afforded by driving, and are associated with poor social and vocational outcomes generally (Fisk et al. 2002; Ylvisaker et al. 2003).

The Useful Field of View test (UFoV) measures the functional range of peripheral vision under tasks of varying cognitive complexity and so is well suited to TBI (Ball and Owsley 1992). The functional range of peripheral vision decreases as the complexity of a given task increases and the UFoV test can provide a good indication of the limits of peripheral vision that might be experienced by TBI patients in "real world" situations. Treatment should focus on enhancing visual stimuli of importance to the patient's work. A simplified work environment to include removal of unnecessary visual stimuli and uncomplicated background décor may improve patients' visual function while also addressing issues of distractibility. Patients with visual impairment will also benefit from having comorbid cognitive issues such as visual neglect, decreased safety awareness, and insight addressed as they can exacerbate the safety risks presented by visual field defects.

32.3.4.5 Speech and Language Impairment

Speech and/or language deficits are present in most patients with moderate and severe traumatic brain injury initially. Due to the diffuse nature of traumatic brain injury, the classic focal aphasias seen in stroke and other focal brain injuries are not as common. However they do occur in about 1/3 of patients, may persist chronically, and include expressive and receptive aphasias, anomias, and dyslexias (Cifu et al. 1996). Treatment consists of restorative, behavioral and compensatory approaches as detailed below (Murdoch and Whelan 2007). The more typical presentation of language impairment following TBI is that of higher level difficulties and corresponds to the impairments of executive function and attention. TBI patients may have trouble with speech volume, emotional content, socially appropriate turn taking, tangentiality, coherence, and unnecessary repetition (Snow et al. 1998). Treatment approach is similar to that described previously for other cognitive and neurobehavioral impairments.

Motor speech impairments are deficits of speech production and occur in 1/3 of TBI patients (Theodoros et al. 2001). When present, they tend to persist, result in decreased speech intelligibility, and are associated with poor social, academic, and vocational outcomes (McAuliffe et al. 2010). Most often, the presentation is of mixed dysarthria, consistent with the diffuse nature of TBI (Sarno et al. 1986). Treatment focuses on compensatory strategies for making speech more intelligible such as re-establishing motor control or muscle retraining with adaptive techniques to slow down the rate of speech production. In severe cases, treatment may focus on the use of a manual communication board or an electronic device for computer-generated speech production. In the workplace, duties can be tailored to address an individual's strengths or weaknesses. Coworkers can also receive training to better understand the speech of a dysarthric patient.

A large variety and complexity of medical complications may occur during the chronic phase of brain injury recovery, a period when the patient is no longer in the highly structured inpatient environment. Close follow-up with a rehabilitation team that specializes in brain injury and includes a physician familiar with the medical complications of TBI will provide the best possible outcomes for patients as they meet the challenges of community reintegration and return to work.

32.4 Overview of Return to Work Models and Supported Employment

Severe TBI results in cognitive, physical (McNamee et al. 2009), and psychosocial impairments that present barriers to return to work (Ben-Yishay et al. 1985; Malec 2001; Malec et al. 2000; Wehman et al. 1990, 2003, 2005; West et al. 2007). It has been estimated that 40.7 % of individuals with TBI who were employed pre-injury return to work 1 year, and 40.8 % 2 years after TBI with a range from 0 to 84 % across studies (Van Velze et al. 2009). Several factors contribute to the wide range of RTW rates including varied classification of severity of TBI, differing definitions of RTW, financial incentives that promote or discourage RTW in different countries, and availability of vocational rehabilitation services (Fadyl and McPherson 2009). In addition, RTW involves a complex interaction among pre-injury characteristics, injury factors, post-injury impairments, and personal and environmental factors which makes predicting outcomes only moderately accurate (Shames et al. 2007).

Although it may present great challenges to both the person with TBI and those providing vocational rehabilitation services, the importance of successful RTW after injury cannot be overstated. Individuals who RTW report an improved sense of well-being and identity, better health status, greater community involvement, less usage of healthcare services, decreased social isolation, and better quality of life (Ben-Yishay et al. 1985; Hart et al. in press; Malec 2001; Malec et al. 2000).

The full spectrum of TBI rehabilitative services includes acute inpatient rehabilitation, post-acute rehabilitation, and actual community re-entry and RTW with assistance as indicated. Vocational assistance may range from instruction on gaining employment to intensive on-the-job training, and outpatient follow-up to help adapt to new challenges and access community resources (Hart et al. in press; Shames et al. 2007).

Primary treatment models include comprehensive programs that feature work readiness training and work trials (Ben-Yishay et al. 1985; Prigatano et al. 1994), case coordination emphasizing early intervention (Malec 2001; Malec et al. 2000), and supported employment (Wehman et al. 1990, 2000, 2003, 2005, 2011; West et al. 2007).

Research indicates that supported employment can improve outcomes for individuals with severe TBI (Chesnut et al. 1999; Wehman et al. 2005) with a job retention rate of over 70 %

(Wehman et al. 1993). This approach to vocational rehabilitation is characterized by individualized employment support, provided and/or facilitated by a vocational rehabilitation professional, often referred to as an employment specialist or job coach (Wehman et al. 2011; West et al. 2007).

Supported employment services are specifically tailored to provide one-on-one support for an individual with moderate to severe TBI to obtain and maintain competitive employment; supportive employment services include ongoing long-term follow-up or job retention services throughout the individual's tenure. These services are more intense that services for individuals with TBI who can manage with counseling and job placement programs. Historically, supported employment developed in the late 1970s and 1980s when individuals with severe intellectual disabilities were relegated to work in nonintegrated settings that paid sub-minimum wage while they "got ready" to work. However, most of these individuals were never deemed ready to work. Individuals who access supported employment services do not have to "get ready" to work. With a supported employment approach, the person with the disability trains for a job on the job so he or she gets ready for work while at work. A brief description of the primary model components and activities involved in implementing an individualized supported employment approach is listed in Table 32.1 below.

Hart et al. (2010) conducted a study that looked at type, amount, and location of treatment prospectively for 6 months after RTW for 65 moderate to severe TBI treated at five TBI Model Systems Centers. Results revealed that the centers providing intensive treatment at work served those with more severe injuries for a longer time, with emotional distress predicting certain aspects of treatment amount and type. Notably, three fourths of the sample remained employed at 6 months. While job coaching and other services were found to be important, the unique effects of treatments on outcomes could not be determined.

Once employment is secured, a critical aspect of supported employment is to provide on-the-job site interventions. The creation of on-site interventions is as much an art as it is a science. The first step in determining the need for an inter-

Table 32.1 Individualized supported employment approach

Model component	Employment specialist activities
Establishing vocational vision and profile	Employment specialist meets with individual with TBI to set up times to get together to explore work interests, preferences, abilities, and support needs. A functional approach is used (i.e., interviews in the home, observations while spending time together in the community) rather than relying on vocational testing (i.e., aptitude or intelligence). Current relevant records may also be reviewed, such as a neuropsychological evaluation.
Job development	Employment specialist uses a variety of approaches to find employment leads by focusing on the untapped labor market or employers who are not advertising work. In addition, as indicated, opportunities to create a job through negotiations are explored with businesses.
Job site training and support	Once the person is hired to work, the employment specialist accompanies him or her to work to provide additional training that extends beyond what the employer provides to newly hired staff. As necessary, while the new hire is learning to do the job to meet standards, the employment specialist may actually perform some of the job to ensure the employer remains satisfied. A variety of instructional strategies and supports are used to train the new employee. Performance data are collected and used to direct the employment specialist's departure from the individual's place of employment. As needed off the job site support is also offered, including transportation training.
Long-term job retention services	Throughout job tenure, the employment specialist remains in touch with the employer and employee and provides support on or off the job as needed. This might include assisting the employee with resolving novel challenges as they arise or new skills training if indicated.

vention takes place early on (prior to the job search) when the employment specialist makes an initial assessment of the individual's abilities to help develop a suitable job. Once hired (during the first few days of the job), the employment validates the person's existing skills and determines what skill areas may require intervention, such as additional instruction on how to perform job duties and use of compensatory memory strategies or assistive technology. Some examples of on-the-job site training strategies that employment specialists may implement are offered in Table 32.2 below.

To measure how well a new hire is learning the job, the employment specialist collects work performance data. If data indicate that the new hire is doing the job to the employer's standard set, no intervention is required. The goal of job site training is to close the gap between the worker's performance on the first day of the job and the employer's performance standards and expectations. Eventually, as the new hire learns the job, the employment specialist gradually fades from the job site while continuing to monitor progress from off site. The employment specialist is available to return to the job site to provide or facilitate additional interventions as needed.

Table 32.2 Job site training strategies

• Use sequence reversal training, where the steps are taught backwards
• Find and teach a routine solution for as many performance tasks as possible
• Teach use of compensatory memory strategies like checklists or decision trees
• Invent sayings or rhymes that can help cue or recall what to do or what not to do
• Verbally rehearse instructions
• Use analogies that identify and present situations already familiar to the worker that are similar to what needs to be learned
• Role playing, particularly when the learner is attempting to develop a skill that involves face to face interactions
• Although repetition may be a boring way to learn, it works for some

32.5 Future Directions

To move forward in the brain injury RTW field, we need advanced high quality research that more clearly defines the nature of vocational interventions (independent variable) for the purposes of replication and training. Conducting traditional experimental control studies in the spirit of Drake et al. (1999) and Becker et al. (2006) is recommended. In addition, long term follow up data (5+ years) is needed to determine which models work best. Researchers should also take a closer look at the study of spillover therapeutic efforts, which may positively influence the overall rehabilitation of TBI survivors; again in the spirit of Drake et al. (1999). Finally, measures to compare long-term employment outcomes are needed. With more rigorous research, supportive legislation and ongoing improvement of medical, rehabilitation, and vocational interventions to address the cognitive, physical, and psychosocial sequelae of TBI, increasing numbers of individuals will have the opportunity to return to work.

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Perspectives on Work for People with Epilepsy

33

Erica K. Johnson

33.1 Introduction

The purpose of this chapter is to address various employment issues related to individuals with epilepsy. First, information about epilepsy as a disability and its economic impact, in terms of work disruption and health care costs, will be presented as the context for examining issues of job placement, work maintenance, and return to work. The focus will then turn to an overview of workplace safety and accommodation issues, as an approach to considering employment retention for people with epilepsy. Next, a discussion of traditional vocational rehabilitation approaches, and their known efficacy, will be presented. Finally, the chapter will review emerging evidence-based approaches and trends in addressing employment and lifestyle issues, followed by a discussion of considerations for future research and practice for healthcare and rehabilitation professionals.

33.2 Overview of Epilepsy and Its Personal, Social, and Economic Effects

Epilepsy is one of the most common neurological disorders, characterized by recurrent unprovoked seizures or disruption of neural activity in the brain secondary to neuronal instability (Begley et al. 2000; Fraser et al. 2012a, b). Estimates indicate that 2.1–2.6 million Americans have epilepsy and approximately 150–200,000 new cases are reported annually (Hauser and Hesdorffer 1990; Yoon et al. 2009). There is a 1–2 % chance of having epilepsy by age 40 and risk increases with advanced age (Devinsky 2002). Additional risk factors include stroke, traumatic brain injury, hypoxia, and high fever (Strine et al. 2005). Comorbid medical and psychiatric conditions in this population are common and include cancer, heart disease, asthma, severe headaches, depression, anxiety, attention deficit disorder, bipolar disorder, and psychosis (Barry 2003; Johnson et al. 2004; Strine et al. 2005). Additionally, individuals with epilepsy are at risk for psychosocial issues such as academic underachievement, social stigma, and impoverished cognitive functioning.

Employment issues for individuals with epilepsy are well established in the literature—both in terms of unemployment and underemployment. The unemployment rate for people with epilepsy has generally been established as two to three times the general unemployment rate,

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even for individuals with well-controlled seizures (Bautista and Wludyka 2007; Hauser and Hesdorffer 1990; Smeets et al. 2007). For those with active seizure disorders (i.e., approximately 20–25 % of the population with epilepsy), unemployment rates may be as high as 50 % (Begley et al. 2000). Further, underemployment of those with epilepsy (i.e., working and earning less than the general population) has been a consistent finding (Bautista and Wludyka 2007; Lindsten et al. 2002; Smeets et al. 2007; Wiebe et al. 1999). Bautista and Wludyka found that 12 % of their mail survey sample reported only part time employment and 11.7 % reported that they were unemployed but seeking employment, while 21.5 % were employed full time. These findings are consistent with other survey-based data that indicated 24 % of respondents reported current unemployment but a desire to have or find employment (Fraser et al. 2011a, b).

The economic burden of epilepsy has been characterized as one that affects individuals and society as a whole due to health care costs, loss of employment, loss of wages, and loss of household work (Begley et al. 2000; Yoon et al. 2009). The lifetime cost of epilepsy has been most recently estimated at $11.1 billion in the USA and the annual cost of epilepsy is estimated at $12.5 billion. Direct costs (e.g., medical—physician and hospital services, diagnostic testing and seizure treatment such as drugs and surgery) account for 14 % of these figures. Indirect costs account for the remaining 86 %. Of this amount, morbidity-related indirect costs (i.e., costs associated with lost productivity in the workplace and home) account for 87 %, or $10 billion per year, and mortality-related indirect costs (i.e., costs associated with loss of future earnings and household productivity due to premature death) has been estimated at 13 % (Begley et al. 2000). These statistics represent a considerable personal and social/economic cost burden—one that drives the need for continuous evaluation and improvement of vocational counseling and rehabilitation efforts aimed at working-age adults with epilepsy. Examining issues related to work access and work return is imperative in the context of cost burden and a desire and ability of many unemployed and underemployed people with epilepsy to work.

33.3 The Employment Problem: Predictors and Correlates of Unemployment

Despite compelling economic data regarding employment issues in the population of people with epilepsy, relatively few studies have examined predictors of employment for adults in the USA (Bautista and Wludyka 2007). Studies from the USA and Western Europe have indicated a number of variables associated, either as correlates or predictors, with employment. Disease-related variables included seizure frequency (lower), number of antiepileptic medications (fewer), and seizure interference with activities of daily living (lower) (Bishop 2004; Hauser and Hesdorffer 1990).

Individual characteristics, such as intelligence, education, personality, age, neuropsychiatric status, perceived stigma, perceived importance of work for personal reasons, and possession of a driver's license have also been indicated (Batzel et al. 1980; Bautista and Wludyka 2007; Bishop 2004; Fraser et al. 1983; Smeets et al. 2007). Demographic and social variables such as gender (female), family income, discouragement from seeking employment, and employer attitudes have as well been implicated (Bautista and Wludyka 2007; Bishop 2004; Smeets et al. 2007).

Finally, prevailing models of disability require examination of the environment as a source of variability and influence. Public perceptions, employer attitudes, and employer willingness to hire individuals with disabilities also influence employment for adults with epilepsy, albeit to the extent that epilepsy is a known issue (Bishop and Allen 2001). That is, some individuals may be able to conceal their epilepsy and choose to do so, for fear of employment discrimination. Unfortunately, the relationships between variables, mediating and moderating effects, and the causality of variables have not been thoroughly explored. Challenges to research in this area include homogenous hospital-based samples, survey-based data, and sample sizes that do not yield adequate statistical power for multiple and complex analyses. However, numerous researchers have concluded that, given the scope and strength of correlates and predictors, coupled with the evidence of employment problems for people with epilepsy, sustained efforts at vocational rehabilitation are warranted (Bishop 2004; Hesdorffer et al. 2013). Regrettably, empirical studies of such programs appear to be even more scarce (Mount et al. 2005). Due to the potential relevance of seizure variables—as the findings are inconsistent—and the influence of employer concerns around safety and productivity issues on the hiring of individuals with epilepsy, an examination of risk and injury prevention issues is important.

33.4 Injury Prevention and Employment Maintenance Issues in Epilepsy

The issue of injury risk is important for several reasons—one is the economic and health importance of secondary disability prevention and the other is the consistently reported concern of employers that hiring an individual with epilepsy carries risk of workplace injury (Jacoby et al. 2005). In recent years, a number of studies have made inroads in clarifying these concerns. Recent reviews indicate injuries of greatest concern to be submersion/accidental drowning, fractures, head injury/concussion, burns/scald injuries, and motor vehicle accidents. On the whole, these are injuries which are more likely to occur outside of the workplace (Nguyen and Tellez Zenteno 2009; Wirrell 2006). Studies included in these reviews involved both prospective and retrospective procedures, and have involved findings from population-based analyses as well as studies of patients from specialty or tertiary care centers. Consistently, these reports indicate mild to moderate increased risk for injury for people with epilepsy. However, studies vary such that identifying risk due to epilepsy per se versus medication side effects and the presence of comorbid conditions is tenuous. In addition, the majority of studies include pediatric samples, making definitive conclusions related to adults challenging.

Neufeld et al. (1999) conducted a study in Israel of 298 consecutive patients with epilepsy. Ninety-one (31 %) patients reported experiencing head trauma or injury for a total of 185 injury events. Sixty-one of these events resulted in significant injuries (40 % blunt injuries and 28 % cutaneous cuts) and 17 % of these events resulted in fractures or dislocations. The authors indicated risk of trauma injury was increased for patients with generalized tonic-clonic seizures, myoclonic seizures, or an early age of epilepsy onset. The injury risk translated to one seizure-related injury every 21 patient years and one serious injury every 64 patient years.

Subsequently, Neufeld et al. (2000) retrospectively compared 145 patients with epilepsy with 145 matched controls on the occurrence of any physically traumatic event over a recent 3 month period. In total, patients with epilepsy reported 27 traumatic events and of these events, three were unrelated to seizures. In contrast, control participants reported 20 injurious events. Notably, none of the reported incidents included individuals with epilepsy who were seizure free and managed on anticonvulsants. This finding underscores the safety-related benefit of seizure control.

For the patients with seizures, Neufeld et al. (2000) reported that the majority of the physically injurious events occurred at home (82 %). Only one individual had a seizure in the workplace compared to eight control participants who sustained injuries in the workplace. In fact, 75 % of the controls experienced injuries outside the home, at work, or in a public area. One interpretation of these differences is that people with epilepsy are more frequently unemployed and therefore may spend more time in the home than those without epilepsy. It is also possible that persons with epilepsy work in relatively safe employment settings where injury rates are low, such as in office settings.

Beghi and Cornaggia (1997) conducted a 1 year, nine country cohort, multinational study of life risks with 833 patients with epilepsy and 833 controls. Findings indicated that the control group did somewhat worse in terms of illnesses and events causing time off from work or school relative to the patients with epilepsy. Although individuals with epilepsy had more total days of hospitalization, this outcome appeared to be the result of a subgroup with more severe seizure activity that required extensive hospitalizations. Patients with epilepsy also reported significantly less illness ($p < 0.05$), and less time lost from work or school ($p < 0.01$). In the latter case, there may be less patient involvement in school or work activity, which could have contributed to this finding.

Wiebe et al. (1999) used the Ontario Health Survey data to examine the impact of epilepsy as compared to general population with chronic health problems and no health problems. Findings indicated that patients with epilepsy tended to have more activity limitations and disability days, but no accident differential in the past 12 months was observed. Again, disability days may have related to a subgroup with more hospitalization or disability days due to frequent seizures.

Lawn et al. (2004) conducted a retrospective analysis of population-based data for 247 Midwestern US residents diagnosed with epilepsy for at least 15 years. Although this study lacked a control group, findings were informative in terms of clarifying that the majority of injuries were minor soft tissue contusions and lacerations that occurred during the course of generalized convulsive seizures. The authors identified that those taking a greater number of antiepileptic medications, living less independently, scoring higher on a measure of ambulatory disability, reporting a history of generalized convulsive seizures, and reporting higher seizure frequency, were at greater risk for injury. However, only seizure frequency remained a statistical predictor in multivariate analyses. The authors cautioned that the excessive restriction of activity and opportunity is unnecessary based on these findings.

A retrospective, population-based study via insurance databases and emergency department records looked at risk with 8890 patients with epilepsy and 26,670 matched controls (Kwon et al. 2010). The authors examined the 1-year incidence of injury and reported a significant difference between the two groups (20.6 % and 16.1 %, respectively), with the majority of injuries being fracture. The authors underscored that people with epilepsy are 1.4 times more likely to sustain an injury, which resulted in medical attention, although notably, the majority of injuries occurred in the home. One issue here is that the study only looked at instances where medical attention was sought—it remained unclear whether the patients with epilepsy were more prone to seeking medical treatment for injuries.

In terms of prospective investigations, Beghi et al. (2002) followed 951 patients with epilepsy and 909 matched controls from eight European countries for 12–24 months. Initial findings indicated significant differences between the patient and control groups with respect to illness and injury occurrence, with the patients sustaining greater numbers of both. However, 25–30 % of illness and injury events were directly attributable to the occurrence of a seizure—once these events were excluded from analysis, the groups were largely equivalent in terms of risk. Again, this research underscores the role of effective seizure control in mitigating risk.

In general, individuals with epilepsy appear to be faring reasonably well in terms of life risks and injury in comparison to healthy individuals and people with other chronic health problems, particularly if seizures are well controlled. The implication of this finding in terms of return to work is that risk for injury or disability outside of work, that could contribute to time lost from gainful activity or seeking work, does not appear to be a salient issue in this population.

33.4.1 Risk in the Workplace

A handful of international studies have been conducted that address aspects of workplace risk and seizure activity, although these are notably older studies. For example, Sands (1961) reviewed 13 years of workers' compensation accident rates in the state of New York. Findings indicated that workplace accidents were twice as frequently caused by sneezing and coughing compared to seizure activity. Risch (1968) reported that in a sheltered work facility for clients with epilepsy, time loss due to seizures on the job equated to 1 h for every thousand hours worked. Risch also reported systematic reductions in industrial insurance rates attributable to the sheltered work setting's safety record. Lassouw et al. (1997) compared the work-related performance of 34 employees with epilepsy to 34 matched non-epileptic employees over a 3 year period. Findings did not support the concept that employees with epilepsy have either higher absenteeism or workplace accidents.

On a larger scale, Zwerling et al. (1997) reviewed data from the US National Health Interview Survey on Occupational Injuries among Workers with Disabilities. This survey included 459,827 US citizens (non-farmers) aged 18–65, and boasted a 95 % response rate. Analyses were adjusted for occupational and age factors. The main outcome measure was presence of an occupational injury (minor to severe in nature) in the most recent year which caused some residual impairment at the time of the interview. The risk factor for epilepsy was 1.56, which is just slightly higher than for an employee with any disability involving a work limitation (1.36). An individual with epilepsy, therefore, has a 56 % greater chance of experiencing a work-related disability and this is only slightly higher than a worker with a prior disability having some type of work limitation (36 %). Although 95 % of all respondents with an injury required some type of medical attention, less than 5 % required hospitalization.

Quattrini et al. (1999) followed 860 Italian patients who were employed at the time of epilepsy diagnosis and continued to work over 20 years. There were no reported changes in job accident rates over the 20 year follow-up period. More recently, Van Den Broek and Beghi (2004) did a 2-year study of 951 individuals with epilepsy and 904 matched controls in eight European countries. Although the people with epilepsy had statistically more accidents at home, in the community or at work the percentages were relatively low. For example, rates of injury at work were 6 % for the epilepsy group and 4 % for the control group—a difference that was statistically, but not clinically, relevant. Accidents were primarily minor (not requiring hospitalization) and involved those with more severe and active seizure profiles, consistent with other findings mentioned above. Finally, Cornaggia et al. (2006) conducted a multinational prospective study of workplace accidents in Europe. The sample consisted of 631 adult patients with epilepsy and 592 matched controls. Results indicated that a significantly higher proportion of people with epilepsy had accidents in the workplace—about twice as many—but that seizures were implicated in only 2 of the 22 reported accidents. For both groups, injuries were relatively mild (contusions, muscle strains, abrasions) and caused equal amounts of time lost from work. Seizure type and frequency was not related to accident risk in the group with epilepsy.

Overall, it would appear that workplace risks due to epilepsy are decidedly not prominent. Serious workplace safety risk based upon these studies appears to be minimal and, in some cases, may actually be less than for those without a disability. Reasons for this finding may be the self-care that workers with epilepsy adopt in the workplace, associated with their need to maintain a healthy lifestyle and avoid alcohol use due to medications. Notably, some selection bias may exist in epilepsy clinic samples being used in these studies and seizure control/severity standardization, but the above injury rate findings are generally quite reassuring as to workplace risk. This understanding thus leads a turn to considerations of ways in which people with epilepsy can be reasonably accommodated in the workplace to facilitate safety and employment integration.

33.4.2 Workplace Accommodations for Qualified Workers with Epilepsy

Employment maintenance is an important issue in epilepsy vocational rehabilitation, for practical reasons as well as research indicating that periods of unemployment negatively affect later vocational service outcomes (Fraser et al. 1983). A number of employment-specific considerations require vocational rehabilitation expertise in order to be completely addressed. One consideration, congruent with Americans with Disabilities Act legislation, is whether a direct threat or harm to the individual or others exists. Examination of the “direct threat” includes considering the duration of risk, the nature and severity of potential harm that might occur, the likelihood that potential harm will occur, and the imminence of that potential harm. In numerous jobs today, as in factory production or fabrication work, there are valuable standard industrial safeguards that further prevent individual risk elevation due to a seizure disorder. At the same time, in the context of modern equipment safeguards, some antiquated mandates, such as that a worker “not be around moving machinery,” are being eliminated.

Another important consideration is that epilepsy affects individuals in different ways. Cognitive issues are salient in this population but vary somewhat among individuals. They are influenced by such variables as seizure type, epilepsy severity, the presence and type of antiepileptic medications, seizure focus/location, and age and education and may include limitations related to information processing, attention and working memory, language function, and visuospatial functioning (Kwan and Bridie 2001). The presence of additional neurological impairments, whether or not they are related to the epilepsy (e.g., traumatic brain injury), may further influence the employee’s cognitive presentation (Millis et al. 2001; Vespa et al. 1999).

A third consideration in accord with the Americans with Disabilities Act is that reasonable accommodation must be considered for qualified job candidates and employees with disabilities. Reasonable accommodations can be categorized in terms of changes in job procedures, work space, and/or the use of assistive devices/equipment. For vocational rehabilitation staff, human resources personnel or other consultants addressing accommodations, information relative to an employee’s strengths or capabilities and functional limitations is needed first. This information could come informally from the individual employee, or more formally from a functional neuropsychological evaluation, a neuro-vocational assessment, a community-based assessment or trial work experience, or a comprehensive rehabilitation plan and be applied to a job or task analysis.

Procedural accommodations can be helpful for individuals with cognitive difficulties. On the low end of accommodation concerns, an individual with basic attention/concentration or divided attention limitations, or with fatigue, may benefit from changes in work scheduling. For example, an employee might be advised to begin work earlier than other coworkers in order to have uninterrupted work time before call and email volumes increase. Calls might then be taken for an hour, followed by return to uninterrupted, non-phone work. Another specific time period might then be scheduled for afternoon telephone and email contact. Alternatively, an individual with nighttime seizure activity may benefit from a later morning start time to manage fatigue. A more obvious change in procedure would be the presence of a supported employment job coach who works on task chaining, cueing, problem solving training, and other similar tasks. Alternatively, a paid coworker can be utilized to mentor employees with neurological disabilities (Curl et al. 1996). Funding for on the job training can be used by state and federal vocational rehabilitation agencies to defray additional costs and supervisor training time for people with neurological disabilities as they learn or re-learn specific occupational tasks (Fraser et al. 2009, 2012a, b).

Workstation organization can be simple and invaluable in achieving productivity for employees with attention and concentration deficits, memory concerns, and difficulties with abstraction and speed of information processing. Examples include basic desktop organization, placement of work space (i.e., desk, table, work bench) away from windows, a noise nexus, or area of mainstream employee foot traffic, or structuring the work station to parallel the work activity or task sequences. Color coding tools or posting sequence photos are also a way to modify the work station and provide cues (Fraser et al. 2012a, b; Warren 2000).

Assistive technologies can be employed to accommodate a variety of cognitive impairments. These technologies can range from specialized adaptive equipment to products in the mainstream marketplace such as cell and smart phones, personal data assistants (PDAs), electronic mail (E-mail), dictation machines, and computer software such as Microsoft Outlook. Software can be used for multiple purposes, such as calendar functions, email organization for reminders, to do lists, correspondence, and other features. In addition, software can also be used for voice-to-text word processing or text-to-speech applications to improve reading and word prediction applications for those with reading, spelling, and grammar deficits. Hardware, such as color printers, digital cameras and video recorders, and smart phone cameras can be used to produce visual cues and reminders as memory aids, such as task sequence photos, and training videos that show tools, materials, and the progression of assigned tasks. As a caveat, it is highly important to match assistive technology recommendations to the needs and capabilities of the end user. If the assistive technology and user are not a "good fit," the technology will often not be used (Fraser et al. 2012a, b).

33.4.3 Job Accommodation and Return to Work Resources

A number of resources exist for the purpose of supporting workers, employers, rehabilitation personnel, and legal advocates in the process of disability accommodation in the workplace.

33.4.3.1 The Equal Employment Opportunity Commission (EEOC)

The EEOC was established by Title VII of the Civil Rights Act of 1964. The EEOC is the enforcing agency for several discrimination-related federal statutes, including Title I of the Americans with Disabilities Act of 1990 (ADA), which prohibits employment discrimination against individuals with disabilities. The EEOC's 800-number routes callers to their closest field office. This resource may be helpful to employers, employees, and vocational rehabilitation consultants in situations involving return to work and disability issues, or in work maintenance concerns.

EEOC Contact Information
US Equal Employment Opportunity Commission (EEOC)
131 M Street, NE
Washington, DC 20507
800-669-4000/(TTY) 800-669-6820
www.eeoc.gov

33.4.3.2 The Department of Labor's Office of Disability and Employment Policy (ODEP)

ODEP provides national leadership to increase employment opportunities for adults and youth with disabilities while striving to eliminate barriers to employment. In addition to providing webinars targeted at helping people understand work incentives for those receiving Supplemental Security Income (SSI) and Social Security Disability Insurance (SSDI), ODEP has established the Job Accommodation Network (JAN), the Employer Assistance & Resource Network (EARN), and the ADA Technical Assistance Centers.

ODEP Contact Information
200 Constitution Ave., NW
Washington DC 20210
866-633-7365/(TTY) 877-889-5627
Submit inquiries to odep@dol.gov.
www.dol.gov/odep/

JAN

The JAN (800-526-7234/(TTY) 877-781-9403; http://www.askjan.org) provides free consultation to employers, employees, job seekers, and return to work consultants to address accommodation needs. JAN has specialty accommodation team members that will consult on the phone or via email. To prepare for consultation, it is important for the caller to know the seizure symptom specifics, the job-specific functional concerns, and work station details to facilitate accurate recommendations. In addition to consultation services, the

JAN website hosts SOAR, the Searchable Online Accommodation Resource. On this portion of the site, users can explore various accommodation options. Although the site does not provide epilepsy-specific categories, users can search by other disability types (e.g., cognitive or motor) that may more accurately address functional limitations rather than a specific medical condition.

EARN

The EARN program (855-725-3276; http://askearn.org/) focuses on supporting employers in recruiting, hiring, and retaining workers with disabilities as part of a diversified workforce. EARN provides technical assistance, consultation, and training to employers around disability awareness, inclusion, accommodation, and interviewing practices. In addition, the program offers a recruitment base through the Workforce Recruitment Program, a resource that matches employers and qualified workers with disabilities. This resource can be of value to human resource and management personnel who are seeking consultation for accommodating and integrating an employee, and for those who are seeking specifically to hire employees with disabilities.

ADA Technical Assistance Centers

The ADA Technical Assistance Centers (800-949-4232; http://www.adata.org) are a network of ten regional centers that offer businesses, government agencies, and individuals' information, guidance, and training on the ADA, including its employment provisions. Parties in need of information and assistance can contact a regional center by phone or internet. This resource offers comprehensive assistance regarding the ADA—not just related to accommodations. As such, information seekers who have questions about interviewing, hiring, or accommodating individuals with disabilities, regardless of role (e.g., employee, customer, patron) may find this to be a more suitable resource—particularly in a pre-employment planning phase.

33.4.3.3 NIDILRR/AbleData

Another helpful informational resource is the US Department of Health and Human Services' National Institute on Disability, Independent Living, and Rehabilitation Research AbleData (800-227-0216; http://www.abledata.com). This searchable site provides objective and comprehensive information about rehabilitation equipment and assistive technology. The site hosts a database of approximately 19,000 assistive technology products, product reviews, information resources, a classifieds section for sale or purchase of assistive technology, links to diverse representations of information centers, and a library of assistive technology-related publications.

33.4.3.4 EFA

Finally, the Epilepsy Foundation of America offers career support information (http://www.epilepsy.com/get-help/managing-your-epilepsy/independent-living/employment), including a free informational online tool that assists individuals with epilepsy with employment searches. It offers guides on job preparation and job search sites, suggestions on disclosing information about epilepsy in the workplace and other resources. Job seekers can contact their local affiliate of the Epilepsy Foundation to inquire about job openings in the regions served by these affiliates or about other employment programs run by these agencies. The Foundation also operates the Jeanne A. Carpenter Epilepsy Legal Defense Fund (http://www.epilepsy.com/get-help/legal-issues). The Fund provides legal guidance on employment matters and other issues to individuals experiencing epilepsy-related discrimination, along with referrals to a nationwide network of cooperating law offices, which provide these individuals legal representation (some or all services are provided free of charge).

33.5 Vocational Rehabilitation and Return to Work Interventions

Although a relatively prominent body of work has examined variables related to employment in adults with epilepsy, scant research exists that empirically defines vocational rehabilitation or return to work programs for this population. In the USA, individuals with epilepsy may be served, for employment maintenance or return to work, through the state-federal vocational rehabilitation (VR) system, community-based rehabilitation providers, or specialty care centers and Veterans' Affairs Epilepsy Centers of Excellence (Fraser et al. 2012a, b). The latter tend to be located in more urban areas within the context of multidisciplinary medical care (Labiner et al. 2010).

Although the state and federal systems maintain comprehensive case data on all clients, peer-reviewed investigations of vocational rehabilitation and case closure outcomes have been limited. Mount and colleagues (2005) analyzed retrospective data for the service year 2000–2001 on 156 state-federal vocational rehabilitation clients in Missouri. Client cases were examined with respect to demographic characteristics, type of vocational rehabilitation services provided (i.e., assessment, transportation services, training, counseling and guidance, and job development), case closure type (i.e., successful, unsuccessful, no services provided, services interrupted, or other), and reasons for unsuccessful case closure. Seizure-specific data was not collected but 33 % of the sample was known to have some form of secondary disability, in addition to epilepsy. Demographically, the sample was primarily Caucasian, 53 % male, and 65 % had between 12 and 14 years of education.

Mount et al. reported a successful closure rate of 19.9 % (i.e., clients with epilepsy were employed for 90 days in the competitive labor market, a sheltered workshop, self-employment, or in the home; 84 % of this sample were in competitive employment) and an unsuccessful closure rate of 41.7 %. Of those closed unsuccessfully, 43.2 % declined services, 23.2 % were closed for other (unspecified) reasons, and 16 % were unable to be reached by the agency. Only 2 % of clients were regarded as too severely disabled to work. The most common services utilized with this sample were assessment (83.3 %), transportation services to access employment (35.9 %), and employment maintenance such as monetary support, clothing, and shelter. Relatively few (22.4 %) were provided job-related services such as job search assistance, placement, on-the-job supports, or job referral.

A number of important points should be taken from this study. For one, job-related services were not emphasized as a whole even though the data support the viability of employment for people with epilepsy. While it is possible that these services were not viewed as necessary within the context of individualized case planning, research from specialty care centers (described in detail below) indicates the broad necessity and benefits of tailored job search services for this population. Second, this low rate of successful closure (employment) has remained steady for people with epilepsy served in the state and federal VR system for several years (Fraser et al. 1984). Third, the reasons for unsuccessful closure were unclear. Mount et al. (2005) postulated that services had not sufficiently addressed the myriad epilepsy-specific issues faced by clients such as physical and neuropsychological impairments. Additionally, although assessment services were utilized to a high degree, the specific kind of assessment was not specified in the data and related to outcomes. Thorbecke and Fraser (1997) advised that traditional vocational assessment (i.e., achievement, aptitude, and interest testing) yields sub-optimal results compared to more community-based or in vivo assessment procedures using an unpaid internship, volunteer, or labor waiver-supported process to temporarily place and evaluate a prospective worker with epilepsy.

Gilmore et al. (2000) also examined national state and federal VR outcomes for individuals with a primary disability of epilepsy, cerebral palsy, or intellectual disability for service years between 1985 and 1995. Depending on the service year, people with epilepsy represented 10–15.3 % of the research sample. The authors found an increase in successful closures with placement in competitive employment over time (69.3 % in 1985, up to 82.8 % in 1995) and a decrease in successful closures with placement into sheltered workshop (24.8 % in 1985, down to 14.9 % in 1995). It was notable that in 1995 the sheltered workshop placement rate for all VR clients with disabilities was 2.1 %. Unfortunately, the research did not specify the overall rate of successful versus unsuccessful closures, and for analytical purposes, people with epilepsy were combined with people with other types of significant disabilities, thus making meaningful interpretations of the data relative only to epilepsy nearly impossible. Importantly, the research reiterates the possibility of competitive employment for people with epilepsy.

In 1983, Fraser et al. described a vocational rehabilitation program located in a specialized epilepsy center that continues to show strong clinical utility. This program is based on a combined model of individual and group counseling, assessment (vocational and neuropsychological), and job placement with follow-up and retention services. Specifically, clients with epilepsy are encouraged to attend a twice-weekly Job Club that draws upon Azrin's model (1980) and psycho-educational counseling/coaching. The Job Club sessions address a variety of job search skills, including resume development, networking and informal job seeking, vocational research and goal setting, interviewing, and strategizing accommodation requests. In addition, clients are encouraged to see their individual vocational rehabilitation counselor on a weekly basis and are provided with services such as neuropsychological assessment, transferable skills analysis, community-based vocational assessment and work-site evaluation, job placement, job search coaching, and emotional support and counseling. Work-site supports are individually tailored and range from minimal coaching around accommodation requests to transitional job coaching with either a professional job coach or a trained coworker as mentor (Curl et al. 1996; Fraser et al. 1983). Although not evaluated in the context of a randomized controlled trial, its components are founded on evidence-based practice (i.e., addressing factors that have been empirically shown to affect employment in adults with epilepsy), and program evaluation data indicate rates of successful placement at 60 % annually along with high client satisfaction (Fraser et al. 1983; Fraser 2007). As such, this specialty model continues to be regarded as an effective epilepsy specialist vocational rehabilitation model and demonstrates the comparative benefit (outcome) related to the state and federal VR system (i.e., successful placement rates are one-third when compared to this program).

33.5.1 Employer-Based Interventions

A comprehensive view of employment issues for people with disabilities also involves examining environmental variables such as public attitudes and perceptions. An emerging area in the investigation of vocational rehabilitation for people with disabilities revolves around employer attitudes and hiring behavior, referred to as demand-side characteristics in the literature. This shift in focus from workers with disabilities to the work environment/employer is emphasized by federal research funding priorities and is consistent with comprehensive models of disability to the degree that disabling conditions in the environment are considered handicapping. While research and interventions have focused on the supply-side (i.e., worker) and have yielded data and models about service needs and approaches, effective placement also relies on understanding the needs of the current labor force, addressing misperceptions around hiring qualified workers with disabilities, and marketing the merits of a diverse work force (i.e., one that includes employees with disabilities) (Amir et al. 2010).

Fraser et al. (2011a) used Ajzen's (2005) Theory of Planned Behavior (TPB) to examine the intentions of employers to specifically recruit workers with disabilities as part of their hiring pool recruitment activity. Specifically, the researchers hypothesized that hiring behavior (e.g., reaching out to individuals with disabilities) would be determined by three components of behavioral intention: positive and negative attitude toward the behavior, the subjective norm or social pressure to perform the behavior, and perceived control, or ability to carry out the behavior. The study surveyed employers/hiring representatives (i.e., presidents/owners, human resources specialists, and senior managers) from a range of companies of various sizes. The TPB accounted for 67 % of the variance in hiring intentions, which is considerable in the realm of social science. Within the model, subjective norms had the greatest influence. That is, respondent beliefs about the supportiveness of higher-ups in his/her company (his/her supervisor, manager, president) had the strongest bearing on whether s/he would reach out to qualified workers with disabilities in recruitment and hiring campaigns. Control beliefs were also predominant, particularly for respondents from smaller companies. These individuals held more negative control beliefs (i.e., beliefs that senior management is not committed to hiring workers with disabilities and that their company does not have job openings or lacks insurance coverage for workers with disabilities) and were less likely to hold positive control beliefs (i.e., that their company can receive tax credits for hiring workers with disabilities or that training in accommodating workers with disabilities is available).

This research holds particular importance for considering return to work for individuals with epilepsy. For one, this forces consideration of whether return to work services should be aimed, at least in part, more focally towards the employer rather than the individual with a disability. Marketing and education efforts that are tailored specifically to company size are important considerations. For example, Fraser et al. (2011a, b) suggest that all efforts need to be aimed at the "hiring gatekeepers" within an organization, and that small companies may benefit more from marketing that emphasizes the positive effects and feelings associated with hiring an individual with epilepsy (i.e., commitment, loyalty, and diversity). Medium and large companies similarly need to be considered in terms of efforts that will engender supportive normative expectations of hiring people with disabilities, but also need targeted information related to the "bottom-line benefits" of hiring people with epilepsy, such as the availability of tax credits, on-the-job-training funds, and the 1993 US Department of Labor waiver for unpaid employment. These notions of advancing specific ideas within organizations of different sizes is a crucial idea, given historical indicators that broad educational campaigns are not effective in changing attitudes (Kokaska and Maslow 1986). Recruiting the support of outreach from senior management and company owners is particularly valuable if subjective norms are to change for the hiring personnel staff.

33.5.2 Epilepsy Self-Management: An Additional Avenue for Employment Support

Recent investigations into the health, well-being, and quality of life for individuals with epilepsy have focused on the area of epilepsy self-management. Drawing from the work of Lorig and colleagues at the Stanford Patient Education Research Center (Jordan and Osborne 2007; Lorig and Holman 2003), these structured, manual-based interventions are conducted in the community (i.e., senior centers, churches, and community centers) with 10–15 participants and their interested significant others, and structured to address specific skills such as (1) medical management, (2) life role management, and (3) emotional management, such as adjusting to situation-induced emotions including anger, fear, sadness, depression, or grief (Corbin and Strauss 1988; Holman and Lorig 2004; Lorig et al. 1986).

Investigations related to epilepsy have focused on addressing different topic areas (stress, sleep or medication management) via varied methodology (in-person, telephone, web-based), but have not undergone the empirical scrutiny achieved by randomized controlled trials (RCTs) (DiIorio et al. 2009). Currently, research at the University of Washington is focused on an RCT of the Program of Active Consumer Engagement in Self-Management (PACES), a consumer-designed self-management intervention (Fraser et al. 2011a, b). While program modules do not focus specifically on work or employment, the objectives of improving one's personal lifestyle, coping with personal challenges, personal goal setting and goal attainment, and communication strategies are prominent. The following areas are addressed in PACES: epilepsy (e.g., medication use or life hygiene), socializing (e.g., engaging new friends, dealing with seizures in social settings or affordable leisure events), a healthy lifestyle (e.g., managing sleep, fatigue, weight/diet), and health insurance/medication cost management. Cognitive-behavioral strategies to improve coping with depression are emphasized (e.g., dealing with cognitive distortions, scheduling pleasant events, exercise, and social support) and can be applied to scenarios involving work challenges—whether involving employment retention or job seeking.

Employment per se is not a focus of this program. However, the program is designed to comprehensively address life problem areas for individuals with epilepsy and the strategies taught can generalize to issues of return to work. For example, if a person is experiencing employment challenges due to inadequate seizure control and depressogenic beliefs about skill, competitiveness as a job candidate, work accommodations, and the economy, s/he may be able to apply the principles of cognitive restructuring, goal setting, and goal attainment scaling to specific aspects of job search and interpersonal problem solving in the work site. To that end, self-management programs raise the question of being complimentary or supportive for an individual engaged in vocational rehabilitation efforts aimed at employment.

33.6 Best Practices in Return to Work

Ideally, the work concerns of individuals with epilepsy would be addressed within an epilepsy specialty vocational program. However, these programs are rare and much of the information in this chapter can be leveraged to serve this population. As such, the following considerations are meant to give the reader guidance around addressing return to work for a person with epilepsy.

- Identify relevant sources of financial, social, and instrumental/collegial support that the individual has available—this matter will shape much of the context of return to work services, particularly in terms of funding for accommodations, psychological resilience, and day-to-day problem-solving.
- In consultation with the individual and relevant other parties, identify the individual's functional limitations—these are the specific issues that may need to be addressed by reasonable accommodation—depending on the work tasks and demands. These should be thought of in terms of activities of daily living, transportation, and workplace activities and skills.
- In some instances, additional sources of assessment may be instrumental in identifying specific areas of challenge/functional limitation, particularly if cognitive concerns are present. In obtaining such an assessment, presenting specific referral questions regarding safety planning, work capacities, abilities, and workplace demands to the evaluator can assist in obtaining clear, vocationally relevant results.
- Seek consultation with a vocational rehabilitation or career counselor to identify specific employment goals as needed. If an individual does not have a specific goal in mind, or a job s/he is returning to, such a counselor can assist in the evaluation of work-related aptitudes and interests.
- Familiarize yourself with and utilize the accommodations and work incentives resources mentioned in this chapter (e.g., the coworker-as-trainer model, the 1993 DOL waiver, and the JAN and AbleData) to (a) identify specific accommodations solutions and (b) market a qualified worker with epilepsy to an employer.
- Make sure the individual with epilepsy receives job placement assistance in the form of resume development, interviewing skills practice, job seeking and networking development. Once the individual has obtained a job, monitoring progress and assisting in problem-solving becomes very important in order to support long term outcomes. Depending on the issues at hand, following a worker for several months may be necessary in order to refine accommodations strategies, and/or coach the individual in disability-

related problem solving at work or home to support work attendance.

- If you are a practitioner engaged in job development and placement, consider building a diverse client/employee "bank" that can be marketed to different companies with various personnel/staffing needs. Look for opportunities to market this roster (clients with epilepsy and specific work skills) to employers seeking to fill positions matching your clients' skill sets.
- Consider the whole person approach. If you are serving an individual who has other issues (e.g., social, emotional, or health) aside from employment/vocational concerns, assist that person in securing help in those needed areas. Often, steady employment can be facilitative in overcoming a number of problems, but they should be addressed in a proactive manner.

33.7 Conclusion

The employment problems of people with epilepsy have been described in the literature for over 50 years (Udell 1960). However, the challenges around defining the issues and consistent, concrete avenues for resolving these problems remain. The case of serious economic costs, to individuals and society, related to epilepsy and disrupted employment (i.e., unemployment and underemployment) has been made. A relatively consistent body of literature casts doubts on common fears that as a population, individuals with epilepsy are not safe or otherwise cannot work due to workplace injury risk. Although a number of scholars are grappling with whether the ADA has led to substantive gains in employment access for people with disabilities, including those with epilepsy, the fact remains that the functional limitations commonly associated with epilepsy can be accommodated in the workplace and that in the USA we have state and federal resources available for addressing such needs.

State, federal, and community-based resources are also available for vocational rehabilitation efforts aimed at job placement and retention. Yet this is where the empirical breakdown seems to occur. Predictors and correlates of unemployment have not been consistently identified in the literature. A realm of possibilities has been suggested, from disease-related variables, such as seizure frequency and medications, to individual characteristics, such as intelligence, neuropsychiatric status, and possession of a driver's license. Demographic, social, and environmental variables have also been implicated, including the attitudes of others. The evidence base of vocational rehabilitation and return to work models is sparse but generally indicates that the state and federal vocational rehabilitation system consistently yields a 20 % success rate for people with epilepsy. That is, for every 100 people with epilepsy who apply for and receive VR services, approximately 20 are employed for 90 days at the time of case closure. Longer term data are not mandated. Fraser et al. (2012b) advocates a specialist vocational rehabilitation model that emphasizes job seeking skill development, interviewing and accommodation request skills, and in vivo assessment approaches. This model has been found to be about three times more effective than the VR system, but very few specialty epilepsy vocational rehabilitation programs exist—latest indication is that there are only two in the USA (Fraser 2007). The findings that underpin these statements have been generally consistent over the past 30 years.

Recent trends in epilepsy employment research postulate the need for interventions (e.g., marketing campaigns) aimed at employers and for establishment of reliable databases of qualified workers with disabilities. These new trends represent a shift in thinking from "treating the individual" to intervening at the social or return to work stakeholder level. The empirical evidence regarding such campaigns is emerging and generally indicates that models of intervention are being developed for testing (Chan et al. 2010) but that the models themselves have not yet been empirically validated. Similarly, self-management interventions, while gaining momentum in the epilepsy research and clinical communities, do not routinely address employment per se and show some areas of empirical challenge. Yet the idea of lifestyle management improvements relating to employment issues is an important one to consider. Overall, the paradigms and research reviewed in this chapter point to some key aspects of the supportive knowledge base about returning people with epilepsy to work, and ideally reveal the areas in which continued refinement of the vocational rehabilitation evidence base is still needed.

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34

Return to Work in Depression and Anxiety

Jason Elliott Peer and Wendy Tenhula

34.1 Introduction

Occupational health and rehabilitation fields have focused on reducing long term disability and unemployment by emphasizing return to work (RTW) interventions (Franche et al. 2005; Shaw et al. 2008). While these interventions have historically been developed for use with physical disabilities and injuries (e.g., musculoskeletal), with the recognition of the occupational disability associated with mood and anxiety disorders, there is also a need for similar interventions for these disorders. There are some promising developments in this arena, both in musculoskeletal RTW interventions that have been modified for mental disorders (van Oostrom et al. 2007), intervention packages composed of cognitive-behavioral therapy (CBT) strategies (Blonk et al. 2006; Lagerveld et al. 2012; Noordik et al. 2009; van der Klink et al. 2003) and disability management (Wang et al. 2007) specifically developed for mood and anxiety disorders and related psychological distress.

In this chapter, we outline existing interventions that include a specific focus on RTW outcomes for individuals with Depressive, Anxiety, Posttraumatic Stress and Obsessive-Compulsive Disorders. In order to provide some context, we begin first with a brief description of these disorders, their impact on work functioning and a summary of optimal treatment for these disorders. Next, we review several RTW interventions specific to depressive, anxiety and related mental disorders. We outline their key elements and available data on their effectiveness. Subsequently, we identify common treatment foci of these interventions and how these may inform current practice. Finally, we outline limitations in this research in order to highlight areas for future development.

34.2 Description of Depressive, Anxiety, Posttraumatic and Obsessive-Compulsive Disorders

As outlined in the recent *Diagnostic and Statistical Manual of Mental Disorders 5th edition* (DSM-5; APA 2013), Depressive Disorders

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now include Major Depressive Disorder (MDD), Persistent Depressive Disorder (Dysthymia), Disruptive Mood Dysregulation Disorder, and Premenstrual Dysphoric Disorder. Major depressive episodes (MDE) have received the most attention in the field because they are also the most common type of depressive episode and are the most strongly associated with occupational disability (Kessler et al. 2006). Symptoms of a MDE include the following: depressed mood, loss of interest (anhedonia), disrupted appetite, sleep disturbance, motor slowing or agitation, fatigue, worthlessness or excessive guilt, concentration difficulties, and suicidal thoughts or behaviors.

The DSM-5 Anxiety Disorders include Panic Disorder, Social Phobia, Specific Phobia, and Generalized Anxiety Disorder. Obsessive-Compulsive Disorder (OCD) is classified now not as an Anxiety Disorder but as a separate Obsessive-Compulsive and Related Disorder. Likewise, Posttraumatic Stress Disorder (PTSD) is presently classified as a separate disorder under Trauma- and Stressor-Related Disorder. Table 34.1 provides a summary of these disorders. While these disorders each have distinct symptoms, DSM-5 classifications and clinical features, they can generally be conceptualized by three overlapping symptom domains: physiological arousal, cognitive worry or rumination, and behavioral avoidance. That is, each of these disorders to some extent, is characterized by a heightened physiological response, worry or rumination, and intentional avoidance of situations or objects that may trigger anxiety. There is some variation in the preponderance of symptoms for different disorders. For example, in the case of panic disorder, physiological symptoms may be the most predominant symptom reported whereas in generalized anxiety disorder cognitive symptoms, such as worry, may predominate. In either case, these symptoms frequently result in similar functional impairments, such as avoidance, poor problem solving, and inefficient coping.

While depressive, anxiety, obsessive-compulsive and posttraumatic stress disorders represent distinct diagnostic categories and classifications in the DSM-5 (2013), they do share several commonalities. One, a critical diagnostic criterion for each of these disorders is evidence of social or occupational dysfunction. A second common characteristic is that many of these disorders have an onset in early adulthood and have the potential to be longstanding with an episodic course (Kessler et al. 2008). Exacerbations in symptoms often result from psychosocial stressors. Thus, these disorders can interfere both with initial career development as well as ongoing career maintenance and advancement (Waghorn

Table 34.1 Summary of common DSM-5 anxiety, obsessive-compulsive, and trauma-related disorders (American Psychiatric Association 2013)

Disorder	Description
Panic Disorder: Classification: Anxiety Disorders	Recurrent, unexpected panic attacks (abrupt surge of intense fear or intense discomfort that reaches a peak within minutes accompanied by a range of physical and cognitive symptoms)
Specific Phobia: Classification: Anxiety Disorders	Marked fear or anxiety about a specific object or situation (e.g., animals; heights) often leading to avoidance behavior
Social Phobia (Social Anxiety Disorder) Classification: Anxiety Disorders	Marked fear or anxiety about one or more social situations in which the individual is exposed to possible scrutiny by others often leading to avoidance behavior
Obsessive-Compulsive Disorder Classification: Obsessive-Compulsive and Related Disorders	Persistent thoughts, urges, or images that are experienced as intrusive and unwanted (obsessions) paired with repetitive behaviors (compulsions) which the individual is driven to perform to neutralize obsessions
Posttraumatic Stress Disorder Classification: Trauma- and Stressor-Related Disorders	Reexperiencing of a traumatic event accompanied by arousal and intrusive symptoms, avoidance of stimuli associated with the trauma and negative alterations in cognitions and mood associated with the traumatic event
Generalized Anxiety Disorder Classification: Anxiety Disorders	Persistent and excessive anxiety and worry that lasts at least 6 months and is difficult to control

and Chant 2005). Finally, it should be noted that symptoms of depression and anxiety are present in less severe forms in other disorders (e.g., Adjustment Disorders), which can also lead to functional disability.

34.3 Impact of Depressive, Anxiety, Obsessive-Compulsive and Posttraumatic Stress Disorders on Work Functioning

While the literature on the functional impact of mood and anxiety disorders on work performance and absence addresses broader questions of clinical outcomes and disability, it directly informs RTW efforts. Frequently, these limitations are the focus of RTW coordination of treatment and/or workplace accommodations. Thus, we briefly outline them here to provide context for the discussion of RTW interventions.

Depression has been found to impact employment status as well as job performance and productivity resulting in significant burden to individuals and costs to employers (Bender and Farvolden 2008). Despite relatively low prevalence estimates of MDD and bipolar disorder among employees in the USA, the presence of a MDE in the past year was associated with substantially impaired work performance both in terms of work absence and productivity (i.e., *presenteeism*; Kessler et al. 2006). Data from this survey are largely consistent with previous reviews (Mintz et al. 1992; Sanderson and Andrews 2006).

Anxiety disorders are also frequently associated with poor occupational functioning and unemployment. Specifically, when compared to a non-affected comparison group, individuals of working age with an anxiety disorder were over two times as likely to be unemployed, have had longer periods of unemployment, and more likely to report work restrictions (Waghorn and Chant 2005). In addition, individuals who are employed and experience an anxiety disorder are more likely to experience decreased productivity and longer work absences relative to workers without an anxiety disorder (Greenberg et al. 1999).

The impact of PTSD on work functioning also warrants comment. Survey data indicate that individuals with PTSD who are currently employed experience significant greater work related limitations compared to individuals with major depression or other anxiety disorders (Wald 2009). Likewise, a PTSD diagnosis has been shown to result in significant work absence or reduced work functioning (Breslau et al. 2004). Further, in US Veteran samples, there is evidence that PTSD is more debilitating with regard to occupational and social functioning than other serious mental disorders, such as mood disorders and schizophrenia (Murdoch et al. 2003). It is anticipated that, particularly in the USA, the field will be faced with increased demand for RTW interventions in order to support former military personnel who served in Iraq and Afghanistan. Recent surveys indicate that the incidence of PTSD is higher among current service members and that these symptoms result in significant functional impairment (Thomas et al. 2010).

Quantitative and qualitative studies have both highlighted the work performance impairments associated with anxiety and depression. Individuals with anxiety disorders who are employed are more likely to report difficulties with work performance when compared to a non-affected comparison group (Waghorn and Chant 2005). Detailed evaluations of work performance among depressed individuals have identified several specific functional limitations, such as difficulties with interpersonal, time and workload management, and physical tasks (e.g., Adler et al. 2006). These difficulties are consistent with qualitative interview and focus group studies of occupational functioning among individuals with anxiety and depressive disorders. Those workers surveyed commonly reported problems with lack of energy and motivation, decreased confidence and productivity, indecision, and poor concentration, as well as social withdrawal (Haslam et al. 2005; Michalak et al. 2007).

Many of these work performance limitations reflect the behavioral and cognitive symptoms associated with depressive and anxiety disorders. There is fairly strong evidence that appropriate treatment of these symptoms results in subsequent improvements in work performance. An early meta-analysis of work outcomes in depression treatment trials indicated that effective treatment of symptoms by either psychotherapy or pharmacology corresponded with a reduction in work impairment and that treatments with longer duration led to increased positive work outcomes (Mintz et al. 1992). Several more recent studies corroborate these findings in depression (Adler et al. 2006; Schoenbaum et al. 2002), bipolar disorder (Frank et al. 2008) and anxiety (Berndt et al. 1997 as cited in Waghorn et al. 2005). However, two caveats apply. First, while treatment appears to have a positive impact on work functioning, these functional benefits appear to occur later than initial symptom improvements. That is, there is a lag in improvements in work performance (Adler et al. 2006; Mintz et al. 1992) relative to symptom improvement. Second, despite adequate treatment of symptoms, workers may still experience residual functional limitations (Adler et al. 2006). These may be related to the initial disorder or side effects from commonly prescribed medications (e.g., Haslam et al. 2005). Nonetheless, these data suggest that the occupational impairment associated with mood and anxiety disorders, PTSD and OCD can be ameliorated with appropriate treatment.

34.4 Description of Treatments for Depressive, Anxiety, Posttraumatic and Obsessive-Compulsive Disorders

Depression, anxiety, posttraumatic and obsessive-compulsive disorders are typically treated with medications, psychotherapy or a combination of both. Here we provide a brief description of pharmacological and psychosocial treatments that are incorporated into RTW interventions and practice guidelines that focus on access and coordination of effective mental health treatment for mood and anxiety disorders (British Occupational Health Research Foundation 2005; Pomaki et al. 2010; van Oostrom et al. 2009; Wang et al. 2007).

34.4.1 Pharmacological Treatments

The effectiveness of several medications for these disorders is well documented and recommended treatment guidelines have been established (APA 2006; VA/DOD 2009, 2010). Common medications for the effective treatment of both anxiety and depression include selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants, and monoamine oxidase inhibitors (MAOIs). While medication management decisions are determined by an individual and his/her prescribing physician, a few clinical points about pharmacological interventions are worth noting. First, medication response is not immediate and often occurs between 4 and 8 weeks after initiation, with substantial individual variation in response times (Nierenberg et al. 2008). Second, as discussed above, individuals taking these medications can also experience unpleasant side effects (e.g., nausea, sedation), which can result in non-adherence. Third, even when adherent, some individuals experience a suboptimal or non-response to medication. Thus, individuals and their prescribing physician may need to try different dosages and/or medications in order to reduce side effects while obtaining an optimal treatment response.

34.4.2 Psychosocial Treatments

By far, the most extensively researched psychosocial treatment for both anxiety and depression is cognitive-behavioral therapy (CBT). There is a well-established evidence base for the efficacy of CBT for both anxiety disorders, PTSD and OCD (Barlow and Lehman 1996; Hofmann and Smits 2008), and depression (Dobson 1989; Gloaguen et al. 1998). The basic theory underlying CBT proposes that a person's feelings and behaviors are determined by their interpretations and attributions (i.e., thoughts) about a situation. The emotional distress associated with depression and anxiety may be related to overly negative thought patterns that can be identified and changed, which thereby leads to reductions in symptoms. A key element of CBT therefore includes learning to recognize and evaluate the accuracy of negative "automatic thoughts," including the identification of specific types of cognitive errors or distortions (Beck et al. 1987). In addition to addressing cognitive distortions, CBT typically includes behavioral strategies such as activity scheduling and problem-solving, which help individuals become more active and engaged with various aspects of their life situation. Behavioral activation strategies can be used to energize and motivate persons with depression by assisting them in setting small step wise goals to increase their activity level both in pleasurable as well as necessary functional activities. Likewise, CBT frequently involves relaxation training and exposure to feared situations for individuals who experience anxiety. Self-monitoring of thoughts, behaviors and symptoms and completion of homework assignments are used to augment the material covered in session.

In general, the CBT therapist takes a collaborative stance, working *with* the client to help them understand the difficulties they are having (i.e., psycho-education), set individualized goals, and develop skills that will bring about changes in their thoughts and behaviors (Beck et al. 1987). The therapy is present-focused and generally time-limited, although the exact duration of treatment is quite variable. CBT can be done either individually or in groups.

Despite the availability of effective treatments for anxiety and depressive disorders, they remain woefully under or untreated in common clinical practice. Multiple surveys in the USA have documented the gap between recommended and received treatment with rates of receiving appropriate medication or psychotherapy guideline based care ranging from only 15–30 % in some treatment seeking samples (Wang et al. 2000; Young et al. 2001). Australian surveys have found that over 40 % of individuals with an identified anxiety disorder do not receive any treatment (Waghorn et al. 2005). Recent data on workers with MDD are somewhat comparable indicating that only one fourth of all individuals with MDD obtained care concordant with recommended treatment guidelines (Kessler et al. 2008).

34.5 Summary of Key Points Regarding Depressive, Anxiety, and Posttraumatic Disorders and Obsessive-Compulsive Disorder and Their Treatments

Effective pharmacological and psychosocial interventions are available for the treatment of depression and anxiety disorders. With optimal treatment many (although not all) individuals experience symptom relief and a corresponding improvement in work functioning. Those individuals who do not experience an optimal treatment response may require additional intervention (either medication or psychotherapy) to maximize functioning. Many mood and anxiety disorders are longstanding or recurring and are exacerbated during times of stress, which may require additional periods of more intensive treatment. Despite availability of effective treatments, recent surveys indicate that too few individuals receive the appropriate recommended treatments for anxiety and depressive disorders.

34.6 RTW Interventions for Depressive and Anxiety Disorders

For the purposes of this chapter, we review current RTW interventions for mood and anxiety disorders and describe their key elements. We have also included some interventions that target related conditions such as work-related stress and adjustment disorders—that share similar symptoms and functional limitations as these can contribute to substantial occupational impairment and disability (van der Klink et al. 2003). To be included in our review, interventions had to be developed and/or tested with individuals who were on sick leave or some form of mental health disability related absence or at risk for such and include a RTW outcome. Based on database searches and hand searches of recent reviews and practice guidelines (e.g., Bender and Farvolden 2008; British Occupational Health Research Foundation 2005; Nieuwenhuijsen et al. 2008; Pomaki et al. 2010), we identified 12 interventions that explicitly targeted RTW in individuals experiencing anxiety and depressive symptoms and related psychological complaints. The majority of these were conducted within nationalized occupational health programs in the Netherlands (e.g., van der Klink et al. 2003). Others, such as those developed in the USA, were intended for managed care companies (Wang et al. 2007).

As demonstrated below, the RTW intervention for anxiety and depressive symptoms do however share several common elements: use of CBT principles and strategies with a focus on work related problems and graded activity, and disability management guidelines or treatment algorithms. Table 34.2 outlines ongoing and completed outcome studies and includes description of the interventions, their samples, practice context and outcomes. Below, we define the key elements and describe how they are incorporated in each intervention. Next, we highlight some variations across these interventions, to highlight strengths and limitations, as well as some alternative approaches and areas for further development.

34.6.1 Use of CBT Principles and Strategies in RTW Interventions

Given CBT's efficacy and effectiveness for treating anxiety and mood symptoms, it is logical that CBT strategies were utilized in many of these interventions. The focus of CBT in these techniques is the enhancement of the employee's coping and problem solving skills and the development of more adaptive behavior. The goal of these interventions is to reduce emotional distress associated with return to work after sick leave and reduce the functional limitations that result from mood and anxiety symptoms. CBT interventions have additional advantages in that they are often manualized, thus making them more easily implemented in a variety of settings, and, provided they are adequately trained, by a variety of interventionists. Several interventions successfully used occupational case managers (Blonk et al. 2006), occupational health physicians (van der Klink et al. 2003) and masters' level mental health clinicians (Wang et al. 2007) to deliver CBT. We describe two interventions that employed a stand-alone protocol utilizing CBT principles to target RTW.

Schene et al. (2007) designed and tested a multiphase manualized intervention focused on work reintegration for individuals on sick leave with MDD. The 11 month (44 session) intervention was delivered through an academic outpatient psychiatry clinic in the Netherlands. It consisted of a five session diagnostic phase that included personal occupational history, functional assessment, collateral contact with employee's occupational physician, and development of a return to work plan. This was followed by the active intervention phase which consisted of 24 weekly group sessions (i.e., a semi-structured supportive group therapy format) followed by 12 weekly individual sessions. These sessions focused on exploring relevant themes (e.g., work problems, perfectionism, interpersonal conflicts), as well as planning for and returning to work. Three individual sessions were conducted during a 20 week follow-up phase. Compared to care as usual (CAU), results indicated that participants receiving the occupational therapy (OT) intervention returned to work, on average, 92 days sooner than those in the CAU alone condition and worked more hours during the first 18 months of the study period. With regard to depression outcomes, both groups demonstrated a significant decrease in depressive symptoms and a significant reduction in the number of participants who met criteria for major depressive disorder, although there was little indication of the superiority of one treatment over the other. A cost-effectiveness analysis indicated that the OT intervention was more costly as a result of the

Table 34.2 Summary of RTW interventions for depression and anxiety disorders (adapted from Peer and Tenhula 2011)

Study	Locale/setting	Sample	Duration	Key treatment elements	Significant RTW outcomes[a]
Stand-alone CBT interventions					
Schene et al. (2007)	Netherlands; academic outpatient psychiatry department	MDD with reduction in work hours of ≥50 % exclusion: history of manic or psychotic symptoms; substance use history	11 months (44 sessions)	Supportive and problem solving group/individual sessions focused on RTW and depression issues; delivered by OTs	RTW 90 days earlier; worked more hours
de Vente et al. (2008)	Netherlands; mental health clinic	Anxiety/depressive symptoms at least 2 weeks of sick leave exclusion: PTSD, MDD, panic disorder	12 sessions	Individual or group based CBT-stress management training	No difference
CBT plus graded activity interventions					
van der Klink et al. (2003)	Netherlands; in-house OH department of large private company	on sick leave at least 2 weeks for adjustment disorder exclusion: major mood disorder	6 weeks (4–5 sessions)	CBT with graded activity RTW focus; delivered by OH physician	shorter time to RTW; 30 % fewer sick days
Brouwers et al. (2006)	Netherlands primary care clinic	On sick leave for minor mental disorder exclusion: moderately severe to severe mood and anxiety disorders	10 weeks (5 sessions)	Same as above delivered by social workers in primary care	No difference
Blonk et al. (2006)	Netherlands; private insurance company	Self-employed; sick leave for stress exclusion: serious psychiatric conditions	5–6 sessions (2× per week)	CBT; graded activity; work place intervention (consultation on accommodations); delivered by case manager	Resumed full work schedule 200 days earlier
Rebergen et al. (2009)	Netherlands; OH service for police department	Police offices on sick leave for mental health problems (~30 % diagnosed with anxiety or mood disorder) exclusion: no specific MH criteria	3 sessions	CBT (stress inoculation, problem solving) with graded activity with RTW focus; delivered by OH physician	No difference
Lagerveld et al. (2012)	Netherlands; mental health clinic	sick leave for psychological problems exclusion: PTSD, Major Depressive Disorder	12 sessions (6 months)	Work focused CBT (W-CBT): standard CBT w/a RTW plan, work based CBT homework and explicit RTW focus at each session; graded activity;	Full RTW occurred 65 days earlier; partial RTW occurred 12 days earlier; financial benefit for W-CBT

(continued)

Table 34.2 (continued)

Study	Locale/setting	Sample	Duration	Key treatment elements	Significant RTW outcomes[a]
Noordik et al. (2009)	Netherlands; OH clinics	On sick leave 2–8 weeks of sick leave for stress-related disorder (anxiety, depression, adjustment) exclusion: psychotic, PTSD, substance use disorder	Not specified	Exposure based CBT intervention-specific focus on developing hierarchy of stressful work situations in which to practice new coping skills; hierarchy is incorporated into RTW plan	RCT underway, no outcome data available
Disability management interventions in mental health					
van Oostrom et al. (2010)	Netherlands;	2–8 weeks of sick leave for adjustment disorder	Not specified	PW facilitation of RTW by OH case manager	No difference
Multicomponent disability management RTW interventions for more severe disorders					
Wang et al. (2007)	USA; managed behavioral health care company	Mental health screening in 16 large companies; targeted those with moderate depression severity	Ongoing contact over 12 months (number of sessions determined by employee preference and/or treatment algorithm)	Care manager made treatment referrals, facilitated engagement in treatment, monitored treatment progress, and when appropriate made additional recommendations based on clinical treatment algorithm; delivered CBT; provided psychoeducational materials.	Worked more hours (2 weeks more per year); lower self-reported depressive symptoms at post treatment;
Vlasveld et al. (2008)	Netherlands; large OH care service	MDD with 4–12 weeks of sick leave	maximum duration 18 weeks	Similar elements to Wang et al. with the addition of a PW component; delivered by OH physician with consultation by psychiatrist	RCT underway, no outcome data available
Davis et al. 2012	USA; Veterans Affairs hospital	Veterans with PTSD currently unemployed and interested in employment; exclusion: SMI and TBI	12 months	Individual Placement and Support (IPS): integrated vocational and mental health care, rapid placement, focus on competitive employment, ongoing support	Those in IPS were more likely to gain employment, worked more weeks and earned higher income

OH = Occupational Health; CBT = Cognitive-Behavioral Therapy; RTW = Return to Work; NHS = National Health Service; MDD = Major Depressive Disorder; OT = Occupational Therapy; PTSD = Post-Traumatic Stress Disorder; PW = Participatory Workplace; RCT = Randomized Controlled Trial; SMI = Serious Mental Illness; TBI = Traumatic Brain Injury

[a] Based on results of research trial comparing intervention to comparison condition (e.g., standard care)

additional group and individual therapy sessions. However, because participants in the OT+CAU condition worked more hours there was a net benefit (earnings subtracted from cost of treatment). That is, the effect of the treatment (more rapid return to work) essentially paid for the cost of the intervention. Finally, there was no indication of an increase in stress as a result of return to work and data did not suggest that working exacerbated depressive symptoms.

de Vente et al. (2008) tested a CBT based stress management training intervention for individuals with stress and anxiety related symptoms with at least 2 weeks of absence from work. They compared three conditions, individual CBT, group based CBT, and CAU. The CBT conditions both consisted of 12 sessions, covering a standard CBT curriculum which included psychoeducation, self-monitoring, cognitive restructuring, assertiveness skills, time management, and relapse prevention. CBT was delivered by masters' level clinicians in a mental health setting (away from the workplace). CAU consisted of standard care provided by an occupational physician, general physician, psychologist or social worker for a maximum of five visits. All conditions showed a significant reduction in depressive, anxiety, and stress-related symptoms. However, among individuals with less severe depressive symptoms, individual CBT showed a more substantial symptom reduction effect. There were no differences across conditions in time to return to work.

34.6.2 Cognitive Behavioral Therapy Plus Graded Activity Return to Work Interventions

Graded activity was originally developed for workers with physical limitations (e.g., musculoskeletal disorders) and has been shown to have some positive results on return to work times (Loisel et al. 2005), although results from more recent studies are mixed (e.g., Anema et al. 2007). In principle, a graded activity approach includes a modified or reduced schedule, modified work tasks, and workplace accommodations, allowing the worker the opportunity to remain engaged in work activities during recovery from, for example, a depressive episode. Such an approach is beneficial as it does not require the worker to be symptom free in order to return to work, thus reducing the amount of sick leave and preventing the transition to long term disability, as well as easing the transition back to full time employment.

The rationale for use of graded activity is highly consistent with a CBT approach and compelling for several reasons. First, it focuses on preventing the long term occupational disability that can be associated with anxiety and depression by following a specific time course of work activity that is not dependent upon the course of symptom resolution (van der Klink et al. 2003). The goal is to foster confidence and promote a sense of success, such that individuals can engage in productive work activity even though they may still be experiencing symptoms. Indeed, in naturalistic longitudinal studies of depressed workers, partial and full work resumption had a positive impact on the course of depressive symptoms (Brenninkmeijer et al. 2008). Clinically, this approach is also relevant as prolonged absence from work can perpetuate negative consequences of depression (isolation, poor self-esteem), and/or heighten the anxiety associated with returning to work (Bilsker et al. 2006). This approach is also quite consistent with the behavioral component of CBT interventions. In the case of depression, increasing activity levels, particularly activities from which one derives a sense of pleasure or mastery, represents a fundamental, effective behavioral intervention for depressive symptoms. Second, in the case of anxiety, exposure to stress and/or feared situations (in the context of therapy) offers the worker opportunity to utilize adaptive coping strategies and correct cognitive distortions associated with these situations (Blonk et al. 2006). In either case, graded activity paired with CBT provides the worker with psycho-education and cognitive coping strategies to deal with anxiety and depression at work (i.e., CBT), while simultaneously providing in vivo opportunities to practice skills (i.e., Noordik et al. 2009, see graded activity). In contrast, stand-alone CBT cannot necessarily ensure in vivo opportunities for practice.

van der Klink and colleagues (2003) developed and tested a CBT and graded activity intervention designed to accelerate employees' return to work who are on sick leave because of an adjustment disorder (e.g., milder symptoms of anxiety and/or depression). The intervention was designed to be delivered by occupational physicians who were part of an "in-house" occupational health department in a large company in the Netherlands. It used a three stage CBT intervention focused on problem solving and behavioral activation. During the first stage, work related problems or stressors were identified and participants were encouraged to engage in more non demanding daily activities. During the second phase, problem solving strategies were developed for the identified stressors. The third phase focused on implementation of these strategies and increasing participants' activity level to include more demanding work related tasks. The intervention was relatively brief and delivered over four to five sessions during the first 6 weeks of sick leave. Compared to routine care, the intervention group demonstrated a significantly more rapid return to work and a 30 % reduction in sick days during the year following the intervention. There were no significant differences between groups on psychological measures of stress-related symptoms or coping, as both groups significantly improved on these measures.

Rebergen and colleagues (2009) conducted an effectiveness trial evaluating the implementation of practice guidelines for management of common mental disorders developed by the Netherlands Society of Occupational Medicine. These practice guidelines were in large part informed by van der Klink et al.'s (2003) intervention. The rationale for these practice guidelines was informed by the fact that occupational physicians are in an ideal position to rapidly provide intervention for mental health concerns thereby avoiding the delays in accessing mental health care. The implementation of the practice guidelines involved training occupational physicians to facilitate a similar three phase intervention focused on more rapid return to work by using CBT and graded activity strategies. There were no differences in RTW times when compared to standard care. However, a subgroup analysis indicated that there was a different pattern of results depending on the severity of anxiety and depressive symptoms. Specifically, employees with less severe symptoms receiving guideline based care experienced less productivity loss than those with less severe symptoms receiving standard care. For those employees with more severe symptoms, an opposite pattern was observed showing that they benefited more from standard care. In part, this finding may have been a function of standard care practice of referring employees with mental health concerns to a psychologist for treatment. That is, individuals with more severe symptoms who were referred may have received more intensive treatment.

It should be noted that a third study using the van der Klink et al. (2003) intervention with a similar sample failed to replicate the more rapid return to work findings (Brouwers et al. 2006). However, in contrast to van der Klink et al. (2003), the intervention in this study was delivered by social workers in a primary care setting and not within the employment setting.

Blonk et al. (2006) also developed and tested an enhanced work focused CBT plus graded activity intervention to be delivered by an occupational case manager involved in return to work. It was designed for individuals who were self-employed and were experiencing psychological complaints (stress, anxiety or depression) with at least 2–3 weeks of disability leave. The occupational case manager focused on assisting the employee in returning to work through work place interventions and accommodations. It was proposed that provision of CBT related stress management in tandem with workplace intervention and graded activity would enhance employees' ability to return to work. The CBT portion of this intervention focused on stress management, including psycho-education, relaxation exercises, self-help books, and homework assignments. The workplace intervention component consisted of consultation on ways to reduce job demands and increase effectiveness (e.g., prioritization of tasks, planning/organizing tasks and conflict management) with the goal of increasing work activity to a partial or full resumption of work. Participants receiving the enhanced CBT intervention resumed a partial work schedule 17 days earlier than a standard CBT group and 30 days earlier than a no treatment control group. The enhanced CBT intervention group resumed a full work schedule approximately 200 days earlier than the comparison groups. All three groups demonstrated a reduction in psychological complaints (e.g., stress, anxiety, depressive symptoms) over the 10 month study regardless of the type of intervention received.

Lagerveld and colleagues (2012) tested a work focused CBT intervention (W-CBT) which explicitly incorporated RTW activities into the treatment protocol as opportunities to meet treatment goals. The intervention targeted, for example, increasing activity levels, practicing stress management or assertiveness skills. Essentially, this intervention used the workplace as a learning laboratory where employees can practice CBT skills. It also made RTW an explicit treatment goal and used similar approaches as Blonk et al. (2006) and van der Klink et al. (2003) that incorporated graded activity components. In contrast to Blonk et al. (2006) and van der Klink (2003), W-CBT was delivered off-site at local mental health clinics. Participants in the trial included employees on sick leave due to a non-severe anxiety or mood related mental health condition–primarily adjustment disorders. Compared to a standard CBT protocol, employees receiving W-CBT fully resumed work 65 days earlier and partially resumed work 12 calendar days earlier. With regard to symptom resolution, there were no differences with both groups showing symptom improvement.

Noordik and colleagues (2009) have initiated a similar trial with a modified graded activity intervention for individuals on sick leave due to depressive and anxiety related disorders. Designed to be delivered by occupational physicians (OP) in a similar “in-house” context as the original van der Klink (2003) study and using a similar treatment protocol, this intervention focused on incorporating CBT exposure principles with a RTW focus (RTW-E). Specifically, this RTW intervention utilized an exposure in vivo approach that focuses on engaging the sick listed employee in a series of exposures designed to shift from an avoidant coping style to a more active one. This is proposed to be accomplished through identifying stressful work situations and adaptive coping strategies and developing a work based stress hierarchy listing least stressful to most stressful work situations. This hierarchy then informs the graded activity RTW plan developed with the employee’s supervisor. That is, less stressful work situations and tasks are undertaken first, which allows the employee to practice new coping strategies under conditions where there is high probability of success, thereby enhancing confidence in the new coping strategy. No outcome data are available as yet.

34.6.3 Summary of Cognitive Behavioral Therapy and Graded Activity Return to Work Approaches for Depression and Anxiety

There were mixed results for stand-alone CBT RTW interventions. A standard stress management training CBT based protocol delivered in a mental health context did not demonstrate improved RTW times when compared to care as usual. However, in post hoc analyses, the studies also found a similar symptom severity effect whereby employees with milder symptoms received greater benefit from CBT with regard to RTW. In contrast, the Schene et al. (2007) study targeted employees with MDD, a more severe mental disorder, and found a significant treatment effect. This is likely due to the intensity and duration of the treatment. Beyond the issue of severity of symptoms, a second distinction between these interventions was the degree to which RTW was a target of treatment. Schene et al. (2007) specifically targeted planning for RTW in group and individual based psychotherapy sessions, whereas De Vente et al. (2008) did not and treatment instead focused on general CBT for stress management.

Data suggest that in at least three studies, CBT plus graded activity yielded more rapid return to work than standard care (van der Klink et al. 2003) or standard CBT (Blonk et al. 2006; Lagerveld et al. 2012). However, two trials (Brouwers et al. 2006; Rebergen et al. 2009) failed to find a similar benefit. In both cases, post hoc analyses indicated that for employees with less severe symptoms the intervention resulted in significantly improved RTW outcomes. In a follow-up study evaluating predictors of RTW, Brouwers and colleagues (2009) found that duration of the mental health problem before sick leave negatively predicted RTW at 3 and 6 month follow-up points. Baseline symptoms of somatization, anxiety and depression negatively predicted RTW at various follow-up points. With regard to positive predictors, employees who expected RTW within 6 weeks had higher RTW rates at 3 month follow-up.

The inconsistent graded activity findings have also been attributed to the degree to which the graded activity intervention is integrated into the work place. Occupational case managers or physicians more closely linked to the workplace delivered some interventions with favorable return to work outcomes. Such an approach is innovative in that it seeks to maximize the effectiveness of these occupational personnel (who already have considerable knowledge of the workplace and job tasks) to address the individual employee's specific difficulties in returning to work. In contrast, Lagerveld et al. (2012) found that proximity to the workplace did not impact outcomes as their CBT plus graded activity intervention was delivered in local mental health clinics. Instead, these authors suggest that the explicit focus on RTW is the active treatment ingredient responsible for improved outcomes. Nonetheless, determining by whom and in which context an intervention should be delivered warrants further research.

One limitation to utilization of CBT strategies for work based interventions is that it requires training and experience to be delivered effectively. Many of the work-based CBT interventions were brief and time limited and used a manualized protocol. However, in these studies, clinicians with expertise in this area supervised implementation of CBT, in order to ensure the high quality of the intervention. For less experienced clinicians, the availability of CBT supervision may not be easily accessible, which raises the possibility that implementation may be sub-optimal, thereby reducing CBT's effectiveness.

In summary, although their rationale is sound, the outcomes are not entirely consistent. There is some evidence that the CBT based RTW interventions are more beneficial for employees with milder mental health conditions (e.g., adjustment disorder), raising questions about how the field can improve RTW outcomes for those employees with more severe mood and anxiety conditions. Findings from the Schene et al. (2007) suggest that increasing the dose and duration of treatment may be one solution. A clear trend among these RTW interventions is to integrate CBT and RTW strategies. This trend is most clearly seen in the hybrid CBT graded activity interventions. Work based graded activity becomes the practice setting for CBT skills, whether these are anxiety management or assertiveness skills, or whether work based tasks are assigned as behavioral activation assignments to target depressed mood and serve as a partial RTW plan. Later in this chapter, we will review some more comprehensive interventions that have been utilized with more severe mood and anxiety disorders.

34.7 Disability Management Return to Work Interventions

Coordination of care is also a common element in RTW interventions, the practice of which is not disorder specific per se but reflects the general practice of disability management. Notably, disability management is often coordinated by a case manager or RTW coordinator of which the primary activities include: assessing workplace factors, clinical interviewing, developing RTW plans, facilitating communication (i.e., social problem solving) among the various stakeholders involved in the employee's care and employment (e.g., supervisor, physician, or union officials), maintaining knowledge of insurance and disability programs as well as legal aspects of RTW, and maintaining knowledge of medical conditions (Shaw et al. 2008). Disability management is now a commonly recommended intervention element in several RTW practice recommendations (British Occupational Health Research Foundation 2005; Pomaki et al. 2010). Some RTW interventions for mood and anxiety disorders utilize treatment protocols delivered by occupational case managers to facilitate workplace accommodations for employees. In some cases, these accommodations were part of the graded activity components (i.e., Blonk et al. 2006). In other cases, the intervention was more specifically focused on facilitating workplace accommodations (van Oostrom et al. 2007).

34.7.1 Participatory Workplace RTW Interventions

van Oostrom et al. (2007) modified a participatory workplace (PW) intervention that was originally developed for workers with low back pain and demonstrated a reduction in sick leave and subsequent accelerated return to work (Anema et al. 2007). The key element of this intervention consisted of work with an occupational health case manager who functioned as a return to work facilitator. Through semi-structured interview with both the employee and employer, obstacles to return to work were identified based on a task analysis. Next, the case manager, employee, and employer participated in a brainstorming session to identify possible solutions or accommodations for identified obstacles and the necessary actions to implement them. The rationale for this intervention is that reduction in sick days and more rapid return to work has positive benefits for employee mental health and employer productivity and efficiency.

van Oostrom and colleagues (2009) evaluated the feasibility of this intervention. The sample included 40 employees who had been on sick leave for 2–8 weeks with psychological distress including depression, anxiety and adjustment disorders and participated in the intervention. The feasibility study consisted of interviewing the employees, their supervisors, and the RTW coordinators about implementation, satisfaction and expectations related to the intervention. Based on the results of the feasibility survey, the intervention was well received by all parties. In addition, the process of the intervention appeared to function as intended. Notably, 151 obstacles to return to work were identified; the most frequent of which included mental workload and individual related stress (e.g., perfectionism). Two hundred and eighty one solutions or adaptations were identified; the most common of which included job redesign (e.g., changing task responsibilities) and communication (e.g., feedback from supervisor). Results of this feasibility survey also indicated that the solutions could frequently be implemented by the employee; relatively quickly implemented (within 3 months); frequently realized within the timeframe established by the employee and supervisor, and frequently rated positively by employee and supervisor. While the feasibility study yielded favorable results, a randomized controlled trial comparing the PW intervention to care as usual failed to yield a treatment effect (van Oostrom et al. 2009). However, among employees who intended to return to work at baseline there was a significantly more rapid RTW for those receiving the PW intervention.

Blonk et al. (2006) also used case managers who were specialists in occupational health, work efficiency and processes to facilitate adjustments in work demands in their enhanced RTW CBT interventions. However, it should be noted that this sample was composed of individuals who were self-employed so they had much greater latitude in the workplace accommodations that they could make.

34.7.2 Summary of Participatory Workplace Return to Work Interventions

Findings from this limited PW literature are consistent with workplace accommodations described in the vocational rehabilitation literature and are incorporated into RTW practice guidelines (British Occupational Health Research

Foundation 2005; Pomaki et al. 2010). Examples of common categories of accommodations for individuals with psychiatric disabilities include the following: flexible scheduling, job description modification, communication facilitation and physical space accommodations (Granger et al. 1997). These accommodations are highly consistent with the findings from the van Oostrom et al. (2009) feasibility study, which identified six categories of employee and employer derived solutions for RTW barriers. These included scheduling modifications, job redesign (e.g., changing work tasks), communication (e.g., supervisor feedback on job performance), training, and increased use of support, as well as non-work related solutions. The most common identified solution was job redesign. These solutions are also consistent with survey literature of individuals with mood and anxiety disorders. Individuals with anxiety disorders indicated a need for a "support person" on the job (e.g., job coach) in order to work (Waghorn and Chant 2005). This finding is consistent with surveys of other individuals with psychiatric disabilities who frequently requested a job coach as their accommodation (Granger et al. 1997). In addition, individuals with mood and anxiety disorders frequently develop self-management strategies to address symptoms in the workplace, such as reducing stress and workload when experiencing an increase in symptoms, use of work routine to maintain structure, developing and using natural supports such as coworkers, and accessing mental health care (Michalak et al. 2007).

It is noteworthy that the PW derived solutions are consistent with prior literature on workplace accommodations, although the process by which they were achieved may be distinct from the process of obtaining formal workplace accommodations under legal protections, such as through the Americans with Disabilities Act in the United States. Indeed, the employee is encouraged to take a much more active role in the PW activities (van Oostrom et al. 2007). Further, there is some indication that the more the employee is invested in RTW (as measured by their stated intention to RTW despite symptoms), the more beneficial the PW intervention was with regard to RTW times (van Oostrom et al. 2009). There is also some indication that employers responded positively to the process and were satisfied with the mutually agreed upon accommodations. Understanding the process of facilitating workplace accommodations in different work and legal contexts is worthy of further research.

34.8 Multicomponent Disability Management Return to Work Interventions for More Severe Mental Disorders

With the exception of Schene et al. (2007), all the studies reviewed thus far have been composed of individuals with milder forms of depressive and anxiety disorders. In fact, several studies explicitly excluded those individuals with more severe forms of these disorders (Brouwers et al. 2006; Lagerveld et al. 2012; van der Klink et al. 2003; van Oostrom et al. 2010) and others included lower rates (30 %) of individuals with depressive or anxiety disorders that met full diagnostic criteria (Rebergen et al. 2009). However, there are additional interventions that include multiple elements designed to target more serious depressive, anxiety, and posttraumatic stress disorders.

In the most comprehensive treatment package to date, Wang et al. (2007) developed and tested a multiphase enhanced depression screening-treatment program that was implemented in a large managed behavioral health care company in the USA. Phase 1 began with a health risk appraisal survey that included screening questions for depression. Employees whose screen indicated the possible presence of depression were invited to participate in a telephone survey to assess depression in more detail. Those with at least "moderate" depression severity as measured by this telephone survey were invited to participate in phase 2 of the study. Phase 2 consisted of a randomized controlled trial comparing the intervention to usual care. A critical component of the intervention was the "care manager" who performed multiple functions including: assessment of need for treatment, facilitation of engagement in recommended treatments, and ongoing monitoring of adherence to treatment and clinical progress.

Recommended treatments included in-person psychotherapy, pharmacotherapy or a combination of both for which the care manager made the necessary authorization and referrals. An innovative feature of this intervention was its flexible treatment algorithm. Specifically, it accommodated individual employee treatment preferences, a range of severity of depressive symptoms, and the individual's responsiveness to treatment. For example, the care manager provided employees who declined treatment recommendations for psycho-education, self-help materials, and ongoing telephone contact to monitor their symptoms. Those employees who continued to experience significant depressive symptoms after 2 months were offered an eight session CBT intervention delivered by the care manager. For employees who participated in the in-person treatment recommendations and continued to experience significant depressive symptoms after 2 months, the addition of a second mode of treatment was recommended (e.g., if receiving psychotherapy, adding pharmacotherapy was recommended). Following active treatment, booster sessions to monitor treatment progress were conducted approximately every 4–8 weeks throughout the duration of the 12 month study period.

The results of the study indicated that participants in the intervention group worked significantly more hours, at a rate equivalent to two more weeks per year, relative to the comparison group. Participants in the intervention group also experienced lower levels of depressive symptoms at 6 and 12 month assessments, had significantly more treatment contacts, and were more likely to obtain specialized mental health care relative to the comparison group. An additional outcome of interest was that there was no difference in intervention effects among those with mild, moderate or severe depression. This finding suggests that the intervention accommodated and effectively treated a range of severity of depressive symptoms.

Vlasveld et al. (2008) have developed a similar multicomponent intervention using a care manager for employees with major depressive disorder (MDD) within the Netherlands occupational health setting. This intervention was designed for employees who have been on sick leave for MDD between 4 and 12 weeks. This time frame was selected in order to intervene early to reduce the likelihood of the employee transitioning to long term disability. The treatment elements were quite similar to Wang et al. (2007) and included provision of self-help materials and an occupational physician (OP) care manager who made treatment recommendations (e.g., medications), monitored treatment progress and treatment adherence, and provided a brief manualized CBT intervention. The intervention also included a PW element similar to van Oostrom et al. (2007) whereby the OP care manager acts as a facilitator between employee and employer to develop workplace accommodations to accelerate the employee's return to work. A treatment plan is developed collaboratively between the employee and OP care manager based on treatment recommendations and employee preference. For example, the employee may opt to begin pharmacotherapy immediately whereby the OP care manager would initiate a medication treatment algorithm. The elements of the intervention are intended to be delivered concurrently (i.e., CBT and PW) and monitored every 2 weeks. If depressive symptoms do not respond to treatment, the protocol allows for the addition of more CBT sessions and/or medication or medication changes. No outcome data are available for this intervention and a randomized clinical trial is currently underway.

Individuals with PTSD were often excluded from the previously mentioned outcome studies (e.g., Lagerveld et al. 2012). In recognition of the significant functional impairments that can result from chronic PTSD, Davis et al. (2012) utilized a more intensive supported employment (SE) approach for Veterans with chronic PTSD. SE is not a RTW intervention generally utilized with individuals with short term disability absences but rather for those who have more significant functional impairments that have adversely impacted their employment histories. SE is a vocational rehabilitation intervention that has a well-established evidence base for individuals with serious mental illness and consists of several standard elements including: rapid job search and placement in competitive employment, integration of a vocational counselor with individuals mental health treatment team, and ongoing time unlimited support by a vocational counselor with a small caseload so as to provide intensive services (Bond et al. 2008). Some additional advantages of SE for PTSD is that it strives to match clients to work settings and jobs that are consistent with their preferences, includes assertive active engagement and outreach and has zero exclusion criteria (Bond et al. 2008).

In a randomized controlled trial, veterans with PTSD who were unemployed were randomized to receive SE or a standard vocational rehabilitation program. Compared to veterans receiving standard vocational rehabilitation, veterans receiving SE were 2.7 times more likely to obtain competitive employment, at a more rapid rate, and worked significantly more weeks during the study period. In addition, SE was found to be delivered with fair implementation. It is noteworthy that, in addition to PTSD, the veterans in this sample also experienced several other co-occurring mental health problems including MDD, panic disorder, alcohol and drug related diagnoses, and had been unemployed for an average of 19 months. Thus, this was a population with more marked mental health symptoms and functional limitations than those in the previously described RTW studies.

34.8.1 Summary of Multicomponent Disability Management Interventions

There are several reasons why more intensive disability management interventions may be necessary with individuals who have more severe anxiety and depression. First, optimal treatment of the disorder is a critical clinical issue for individuals with severe depression or anxiety. Well established evidence based pharmacological and psychotherapeutic interventions are available for the treatment of depression and anxiety. Second, several studies indicate that adequate treatment of anxiety and depression is associated with improved work functioning and vocational outcomes. Third, despite the availability of evidence-based treatments that can impact work outcomes, several survey studies indicate anxiety and depression are often under or untreated.

In large part, these findings provided the impetus for several of the interventions. Notably, interventions developed by Wang et al. (2007) and Vlasveld et al. (2008) both target MDD and utilize an active disability management model. A care manager who provides psycho-education, treatment recommendations, and monitors treatment adherence and progress, follows identified depressed employees. Both interventions use a treatment algorithm in order to ensure an optimal treatment response, such that additional treatment options (e.g., adding psychotherapy to pharmacotherapy) are provided to individuals who continue to experience symptoms. This active disability management model focuses on ensuring that each employee receives the best treatment and also seeks to maximally engage employees in their treatment. Results of Wang et al. (2007) are promising and demonstrated clinical, vocational as well as some economic benefit (i.e., reduced absenteeism). The latter finding increases the chance that this intervention may be more widely adopted by employers and managed care companies interested in reducing the economic burden associated with depression in the workplace. In the case of PTSD, a more intensive service with active outreach and long term follow-up yields better outcomes for unemployed veterans with significant co-occurring mental health conditions. However, in both cases there is clearly some room for improvements in outcomes.

34.9 Summary of Key Strategies, Outcomes, and Future Directions for Return to Work Interventions for Depressive, Anxiety, Obsessive-Compulsive Disorder and Trauma-Related Disorders

- *Use of CBT principles that are explicitly integrated with RTW focused goals and activities*. This is an innovative and intuitive manner by which to enhance the generalization of CBT oriented skills and strategies for anxiety and depressive related symptoms. By explicitly linking newly learned skills to workplace based stressors, the intervention can be delivered more efficiently and with greater precision, thereby enhancing RTW outcomes.
- *Use of participatory workplace RTW interventions to facilitate mutually agreed upon solutions to RTW barriers*. This strategy seeks to more actively engage the employee in problem solving with the employer to identify solutions to RTW barriers. As an intervention, it has been well received and the solutions identified in a recent trial are quite consistent with the literature on reasonable accommodations. The practice may show promise as an alternative to the sometimes more complex process of requesting reasonable accommodations.
- *Use of more intensive multicomponent disability management interventions may be required for more severe anxiety and mood disorders*. These interventions recognize that more severe disorders require interventions that are more comprehensive and delivered over a longer duration. Often, these interventions emphasize the significance of optimal mental health treatment and seek to facilitate access to good evidence based mental health care. They also incorporate multiple components and utilize treatment algorithms to coordinate care.

34.10 Outcomes and Future Research

While the strategies presented in this chapter are innovative, outcome data are inconsistent and modest. In particular, several published studies yielded negative findings (Brouwers et al. 2006; De Vente et al. 2008; Rebergen et al. 2009; van Oostrom et al. 2010). There was some evidence that individuals with less severe symptoms experience more benefit from the interventions. These inconsistent findings raise questions about the interventions' designs. Such questions include: Are these designs delivering an appropriate dose and duration of treatment? Do they have a specifically focused RTW goal? Do they need to be modified or combined with other interventions? Where and by whom should interventions be delivered to be optimally effective? How should graded activity and CBT and PW interventions be modified for employees with more severe disorders? Are more intensive disability management interventions appropriate for individuals with less severe forms of anxiety and mood disorders?

Several studies identified motivational and self-efficacy characteristics of employees, in addition to the severity of their symptoms, which appeared to affect outcomes. Specifically, expectations that one would return to work in the next 6 weeks (Brouwers et al. 2006) and an intention to return to work (van Oostrom et al. 2010) both were found to enhance the impact of RTW interventions. These findings raise the possibility of developing more sophisticated assessment technology in order to better match interventions to employees who are psychologically "ready" or motivated to return to work. Alternatively, it is plausible that the field may develop multiphase RTW interventions that include motivation enhancement. Such interventions have been developed for other more severe mental health conditions (e.g., a combined motivational interviewing and supported employment intervention such as described in Larson et al. 2007).

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Return to Work in Serious Mental Illness

35

Terry Krupa

35.1 Introduction

The employment rates for people with serious mental illness are estimated to be between 10 and 25 % (Marwaha and Johnson 2004). These rates are low when compared to general population, people experiencing other health and disability conditions, and compared to people who experience moderate or mild forms of mental illness (Mechanic et al. 2002). Yet the evidence we have suggests that many people with serious mental illness have an interest in employment (Macias et al. 2001) and that they value the benefits of employment and see it as a means to their recovery (Dunn et al. 2008).

Serious mental illness is not a homogeneous health condition, but rather a concept used to define a collection of features related to pervasive and persistent mental disorder, and challenges in daily and community living. Typically, the features of serious mental illness include the presence of a major mental disorder, and often a mental disorder where psychosis presents. Also included is significant disability or evidence of a range of activity limitations and participation restrictions in daily life situations considered to be culturally and age appropriate. Finally, it involves mental disorder and disability issues that persist for a lengthy duration of 1 year or longer (Kessler et al. 2003). Compromised employment and participation in the community workforce is a prevalent issue among those who experience serious mental illness.

In response to the disability and compromised community participation of people with serious mental illness, efforts have been directed to developing early intervention approaches delivered at the time of (or even before) a first episode of mental illness. These early intervention approaches have been directed to assertively treating mental illness, and to maintaining and enhancing participation in work-related activities with a view to preventing social and economic decline (McGorry 2005). For example, the International First Episode Vocational Recovery Group (2010) has developed an international consensus statement to engender commitment to improving vocational outcomes. With the broad dissemination of early intervention services and a growing body of experience and research related to employment, any discussion of return to work for serious mental illness would be remiss if it did not consider the work being done in the early intervention field.

This chapter provides an overview of the current practice and research related to return to

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work and serious mental illness. It begins with a discussion of issues related to the application of the "return to work" concept to this population and argues for a broader conceptualization that can capture a broader range of productive activities. The following section describes the concept of a recovery-oriented service system, with a view to positioning contemporary return to work practices within the philosophical and conceptual framework currently guiding the field. The next section reviews a range of biological, psychological, and social challenges inherent in the return to work process to provide a foundation for understanding the holistic approach needed to successfully address the employment status of individuals with serious mental illness. A set of principles that guide return to work practices is described. Next, the chapter reviews specific employment related intervention approaches that are, to varying degrees, supported by research evidence. Finally, the chapter concludes with a summary of the implications for practice.

35.2 Applying the "Return to Work" Concept to People with Serious Mental Illness

Mechanic et al. (2002) described the difficulties in defining the work status of people with serious mental illness. Using data from various national surveys, they point out that there is considerable variability in the work patterns of people with serious mental illness, and highlight that for those who are working, many hold high status positions and have employment patterns remarkably similar to the general population. The majority, however, are not working and have employment patterns inconsistent with the notion of "return to work." It is this latter population of people with serious mental illness that is the focus of this chapter.

The notion of return to work suggests that the individual has some form of attachment to the labor market. Perhaps the person is preparing to return to his/her job following a period of leave, or at the very least, the person has experienced a period of unemployment but is engaged in resuming a working life. But for people with serious mental illness the level of attachment to the communitylabor force is generally weak. They may have had lengthy disruptions in their work participation and they can have few work-related connections and networks. They are more likely to be financially supported through government disability pensions than they are by an income from wages or through unemployment benefits or employer-based disability benefits (Krupa et al. 2012). While they may be unemployed, there is evidence to suggest that the majority are not seeking or actively preparing for work (Kozma et al. 2011). Those who do have connections to some form of employment are likely to be working in positions that are entry-level, part time, or casual. In these circumstances, they are participating actively in the community workforce, but may experience fewer work benefits and security, and have restricted opportunities for career advancement. For those people seen in early intervention services, their labor market attachment can be described as vulnerable. Individuals may experience a significant disruption in their expected career trajectory. With major forms of mental illness emerging in young adulthood, educational participation can be compromised and access to early work experiences and the development of employment networks thwarted.

The Mental Health Commission of Canada (2009) proposed the descriptor of the "aspiring workforce" to capture the fact that people with serious mental illness are highly vulnerable to marginalization from employment participation and yet they maintain a desire to participate in employment. The image of an aspiring workforce is hopeful and suggests potential strengths and unrealized ambitions. The descriptor also has the potential to distinguish this population with respect to their needs and issues in employment. While there has been increased attention on and funding to address the impact of mental illness and problems of mental health on employment, much of this work has focused on workplace mental health and return to work and disability management for mental health concerns in the workplace. While these are all very positive initiatives, there is the danger that without specific attention to their particular employment situation, individuals with serious mental illness who have limited labor market attachment will find their needs and issues on the margins of strategic practice and research initiatives.

Given the limited labor market participation of people with serious mental illness, there may be a need for a more extensive conceptualization of work-related outcomes beyond the single dimension of employment suggested by "return to work." Such a conceptualization could increase sensitivity, capturing positive changes in employment status that might appear small, but hold tremendous significance with respect to shifts in an individual's relationship to the labor market. These positive changes would include, for example, positive shifts among individuals with serious mental illness with respect to their intention to work, attitudes and actions from family, friends and service providers that demonstrate support for work-related intentions, evidence that employers and workplaces provide opportunities and conditions for fair and equitable employment, and comprehensive and ongoing employment supports to ensure retention of employment and the advancement of positive career opportunities.

Kozma and colleagues (2011) proposed a five level definition of employment that included participation in the student role and distinguished between those unemployed but seeking work from those who are unemployed and not seeking work. They argued that such a multilevel categorization of employment may be more sensitive in demonstrating subtle but positive shifts towards labor market attachment. Goering and colleagues (2004) suggested that in addition to a range of productivity activities, the comprehensive measurement of employment outcomes should attend to a variety of concerns related to work participation. Their conceptualization of work-related outcomes includes (1) aspects of the work experience that indicate stability and well-being (e.g., satisfaction on the job, social networks) and (2) aspects that capture work status in the broader social context (e.g., level of pay, occupational category). So, for example, using this conceptualization of return to work, outcome studies would be able to show if an individual with serious mental illness experiences success in finding a job in a community business (positive outcome), and receives fair wages for work performed (positive outcome), but experiences social exclusion because of few opportunities to interact meaningfully with coworkers or the public (undesirable outcome).

The idea of broadening the intended outcomes of work-related services to extend beyond entry into paid employment position is controversial. There is a concern that given the historical neglect of employment for people with serious mental illness any broader conceptualization of return to work will be adopted as a rationale to explain a lack of effort to assertively address their participation in the community-based labor force. This said, recent advances in the development of employment-related interventions and program structures do suggest a growing maturity and sophistication in a field that could benefit from ongoing and open dialogue about the meaning and nature of employment for highly disenfranchised people.

35.3 Recovery, Employment, and Mental Illness

Contemporary employment initiatives for people with serious mental illness are occurring within mental health systems undergoing transformations to ensure the delivery of services that are consistent with a recovery-oriented vision. This recovery vision refers to systems that are less exclusively focused on the amelioration of symptoms, functional limitations, and other personal deficits of persons with mental illness. A recovery-oriented system is more directed to enabling people on a journey of moving beyond the limitations associated with mental illness, to experience an awakening of hope and possibility and developing purpose and engagement in an active and participating life (Davidson et al. 2007; Slade 2009). While employment may not be essential to the recovery journey, it is an important means to realizing the dimensions of the recovery process.

Employment is considered an activity with important personal and social meanings. The absence of employment can compromise the ability of people with serious mental illness to experience particular health and well-being benefits associated with meaningful employment. For the general adult population, engagement in employment, and other productive activities such as parenting and education, provides important opportunities for knowledge and skill development, making contribution to society, developing important social connections, physical activity and financial security. Employment also offers a level of structure and daily routines, providing time anchors for important human patterns such as the sleep/wake cycle, and for social routines that support human interactions and activities. Concerns held by many mental health service providers that the stress of employment could lead to acute relapse of the mental illness have been challenged by advocates in the field who argue that there is a lack of hard data that working leads to negative clinical outcomes and that there is much reason to believe that unemployment is at least as stressful as working (Marrone and Golowka 2000). Employment focused studies have suggested that participation in work could actually enhance mental health stability by, for example, providing a distraction from troubling symptoms and by providing a meaningful context to engage in developing coping strategies (Dunn et al. 2008; Krupa 2004).

35.4 Addressing Challenges to Employment: A Biopsychosocial Perspective

People with serious mental illness are diagnosed with major mental disorders that include a broad range of symptoms and impairments that can impact an individual's capacity to enjoy employment success and satisfaction. While diagnostic systems standardize the symptoms associated with specific diagnoses, there is no firm evidence to support the idea that employment outcomes can be predicted by diagnosis (Tsang et al. 2010). Current perspectives on recovery in mental illness have stressed that recovery related outcomes, including participation in meaningful social roles such as employment, are possible even when symptoms of serious mental illness persist.

The research investigating the relationship between symptoms and work participation has suggested that in serious mental illness the presence of negative symptoms is a stronger predictor of unemployment than positive symptoms (see review by Tsang et al. 2010). The relationship between negative symptoms and employment has also been found among individuals experiencing their first episodes of serious mental illness (Turner et al. 2009). Positive symptoms include hallucinations, delusions and patterns of disorganized thinking and behavior that have the potential to interfere with vocational functioning. Negative symptoms include the dampening of behavioral, emotional and expressive responses, demonstrated as problems with apathy, avolition, a reduced experience of pleasure in life, social withdrawal, blunted affect and poverty of speech. Negative symptoms can reduce an individual's ability to experience the social and emotional benefits associated with employment, to access the drive and energy required to meet the demands of working and to sustain the commitment necessary to carry through in the face of ongoing work related demands. In addition, they can compromise the individual's ability to relate to coworkers, supervisors, customers and other important people in the work environment.

There are several possible explanations for these findings. First, there is the idea that prevalent and persistent negative symptoms, particularly when they begin early in adolescence, may reflect a subtype of mental illness that has a more socially damaging course. Another possible explanation is, that compared to positive symptoms, medical treatments and psychosocial interventions have been less effective at reducing negative symptoms and their social impact. It also might be that these negative expressions of mental illness may represent an interaction of clinical symptoms and a general psychological and emotional response to the difficulties experienced in the context of living daily life with mental illness.

The actual nature and patterns of symptoms experienced are highly individual, and need to be considered within the context of the person's whole life. Symptoms of serious mental illness will have both common and unique features, may be experienced in highly variable ways, and can be sensitive to contextual factors. The advancement of the recovery vision in mental health systems has advanced our understanding of how the experience and impact of symptoms of mental illness and their functional implications can be mediated by insight, self-awareness and personal agency. Wellness intervention approaches that focus on the development of self-awareness of symptoms and their triggers and on proactively developing self-management strategies have shown promising results, although their impact on employment has yet to be fully investigated (e.g., Barbic and Krupa 2009; Cook et al. 2010).

Similarly, qualitative research has demonstrated how individuals can manage work demands in the presence of ongoing features of mental illness. For example, case studies of individuals with schizophrenia who were gainfully employed described a range of ways that they negotiated the ongoing features of mental disorder at work including remaining vigilant to signs and symptoms of the mental illness, compensating for illness features on the job and interpreting their work-related difficulties within the framework of the universal struggles associated with employment (Krupa 2004).

People who have a serious mental illness frequently experience impairments in cognition and research has demonstrated a strong association between cognition and employment (McGurk et al. 2009; Tsang et al. 2010). McGurk and Wykes (2008) stated that in the context of serious mental illness individuals can experience impairments in most areas of cognition, "including attention, psychomotor speed, working memory, verbal learning and memory and executive function" (p. 350). All jobs place cognitive demands on workers, but the nature of these demands will vary across jobs. However, current perspectives on employment highlight that the labor market has become highly knowledge-based, with increasing demands on the cognitive capacities of workers. These demands extend beyond the demands associated with the tasks of work to include the cognitive demands related to the complex social interactions on the job. These cognitive demands of work include demands for learning, critical thinking, creativity and imagination, perceiving and interpreting interpersonal information, information acquisition and processing, to name but a few (Shaw and Lysaght 2008).

Personal narratives of people with serious mental illness describe how career expectations can become disrupted and derailed, leaving the individual both with an overwhelming sense of loss and grief and associated aimlessness and inertia (see for example Deegan, 1988). A range of negative experiences, such as failed attempts at work, the loss of social support for working and falling behind one's peers in career development all contribute to the development of internalized stigma—the acceptance of the belief that one is lacking in essential abilities and unworthy of participation in important social roles such as employment. In this way, internalized stigma will compel an individual with serious mental illness to give a negative response to the question, "Would you like to work?" or to interpret challenges on the job with negative self-evaluations that undermine the sustained commitment and learning required to maintain employment. Ultimately, this scenario can engender a negative cycle of neglect by employment services that reinforces internalized stigma. Ritscher and Phelan (2004), describe this as an "erosion of morale" (p. 257) that becomes self-perpetuating. This erosion means that developing work interest among people with serious mental illness requires direct attention to cultivate the conditions that may lead to desire for change (Cook and Razzano 2000).

Perhaps the most prevalent forces that marginalize people with serious mental illness from employment are social in nature. These mental illnesses tend to emerge in critical developmental periods when foundations for careers are being laid. For many, the illness experience disrupts their education, limiting their job choices, their access to high paying jobs, and their ability to plan a career path (Baron and Salzer 2002). Similarly, their social networks can become exceptionally limited, and within these networks there will likely be few social contacts that are engaged in helping the individual to secure and sustain employment, or perhaps even see employment as likely and encourage the individual to consider working as a viable option.

The majority of people with serious forms of mental illness will be living in poverty conditions. In countries where it is available, most people with serious mental illness will be receiving a government disability income (Mechanic et al. 2002; Krupa et al. 2012). While this provides an important measure of financial security, the actual dollar figure they receive is typically enough to provide for only the very basics in daily living needs. In addition, the extent to which these income structures pose a disincentive to employment is well known. To receive these income benefits will typically require an evaluation of the individual as significantly disabled for a long-term period by qualified health professionals, an evaluation that can contribute to internalized stigma. These income benefits can come with an array of administrative processes that can leave an individual feeling financially insecure when they attempt employment. Adjustments to this funding with paid employment will vary by jurisdiction. They can include, for example, the loss of medical benefits if the individual leaves the plan, reductions in housing subsidies and taxation policies that can leave the individual believing that, in the end, they will be more financially disadvantaged or insecure if they pursue employment. Even where employment supports are available through these plans, people with mental illness can be unaware of their entitlements under these plans. Overall, these disincentives can discourage the individual from employment, or even from following through with vocational services directed to supporting employment (Krupa et al. 2012).

For people with serious mental illness, challenges related to employment-related stigma are profound. A model of the stigma of mental illness and employment developed by the author and colleagues suggested that in the workplace they are likely to be subject to negative attitudes about their competence to perform work tasks and to contribute to good workplace social relations, and concerns about dangerousness. In addition, their participation in vocational programs in the mental health system can engender an attitude of “charity” among employers, and weaken their understanding of people with mental illness as citizens with rights to access to employment (Krupa et al. 2009).

One of the greatest challenges may be the extent to which mental health service providers and systems associate clinical features of serious mental illness with the inability to work, and subsequently fail to see the potential for work, prioritize employment outcomes or facilitate access to employment-related services and opportunities. The assumptions that mental health service providers hold with respect to the potential for employment stress to exacerbate mental illness, coupled with their lack of understanding about how contemporary employment approaches work directly with individuals and workplaces to address employment demands, may explain their caution in promoting employment. It has also been proposed that the structure of mental health services may limit the ability of service providers to attend to employment. For example, studies on assertive community treatment, a comprehensive team approach to supporting individuals with serious mental illness in the community, have demonstrated how the service philosophy and structure which is largely focused on addressing clinical issues, can undermine attention to employment (Horgan 2007; Lurie and Kirsh 2007).

35.5 Principles Guiding Employment Support

Contemporary approaches to improving the employment status of people with serious mental illness are developing from a set of defined principles meant to encourage a shared understanding of important values, concepts, goals and objectives, and to create a foundation for standards in practice while encouraging ongoing innovation (Kirsh et al. 2005). Five of these principles, described here, are extracted from the growing research in the field (e.g., Bond 2004; Bond et al. 2008a, b; Kirsh et al. 2005).

The first principle espouses the importance of focusing on employment as the desired outcome. This principle counteracts the historical tendency in the mental health field to view employment as an unrealistic option. The second principle supports rapid entry into employment. This principle states that individuals should be enabled to access employment in a timely manner and provided with the support they require, rather than undergoing overly lengthy prevocational experiences. The third principle espouses the importance of matching employment with the individual's preferences and being collaborative in determining the nature of the employment supports required to acquire and sustain employment. The fourth principle highlights the importance of individuals having access to ongoing employment supports that are prepared to address the comprehensive range of factors that will impact on employment success. In addition to the seamless integration of treatment for mental illness, employment supports must be prepared to attend to the wide range of biological, psychological, social and workplace factors addressed earlier in this chapter. Finally, the fifth principle highlights the importance of addressing employment from a life-career perspective. Therefore, beyond acquiring and sustaining a job, employment supports are expected to attend to issues such as job status and advancement.

The principles highlight the complex knowledge and experience base required of individuals delivering employment supports to people with serious mental illness. Indeed, the field has witnessed increasing attention to defining the nature of the competencies required by service providers in this area and evidence relating training and practice standards consistent with these principles to positive outcomes is growing (Bond et al. 2008a, b; McCarthy et al. 2005).

35.6 Employment-Related Interventions

Intervention approaches that improve employment outcomes for people with serious mental illness can be organized into two broad categories. The first are those interventions that focus on enabling individuals with serious mental illness to gain access to, and to sustain employment. These approaches are concerned with ensuring that individuals access employment that demonstrates fair wages, good work conditions and equitable work practices. The second broad category includes focused interventions, which address specific factors impacting employment, and *when coupled with employment support interventions* can further improve employment outcomes.

35.6.1 Approaches to Employment Support and Creation

The most well developed, researched and disseminated approach to supporting the employment of people with serious mental illness is the Individual Placement and Support Model (IPS). Based on the principles identified previously in this chapter, employment specialists working within IPS meet frequently with individuals with serious mental illness to encourage and define their job preferences, assertively develop and implement plans for finding employment, provide extensive outreach to employers, and offer time-unlimited follow along supports to individuals in their jobs (Bond 2004). The model provides the flexibility necessary to develop a comprehensive array of employment supports, directed at a wide range of stakeholders. For example, employment specialists in this model can engage the individual with mental illness in developing coping strategies to deal with illness experiences on the job, provide supervisors with information about accommodations and practices to ensure a good match between the work and the individual employee, and inform mental health clinicians of employee successes with a view to promoting a recovery vision in service delivery. A recent study identified a broad range of characteristics and competencies associated with the successful delivery of IPS services by employment specialists: initiative to facilitate the engagement and deepen the commitment of both individuals with serious mental illness and employers; a commitment to community outreach; ongoing persistence to address issues emerging both with the individuals served and with employers and other clinicians; hardiness to bounce back from setbacks; the empathy required to understand and connect with the experiences of individuals with serious mental illness; a sense of passion for the work; a strong team orientation; and a professional service orientation (Whitley et al. 2010).

There is a now an extensive body of research supporting the effectiveness of IPS in improving the employment outcomes of people with serious mental illness, when it is practiced with fidelity to the critical ingredients of the model (Bond et al. 2008a, b). Compared to a variety of control groups, the model reduces time to secure employment and the duration of employment. Positive employment outcomes have also been demonstrated for IPS models applied to populations of young people experiencing their first episodes of psychosis (Neuchterlain et al. 2008). Concerns about IPS outcomes have included the extent to which the employment secured is part time, and largely involves job positions with low status, low pay, few benefits and limited opportunities for advancement. Innovative efforts to address these concerns have included, for example, initiatives involving supported education, which enables training in marketable skills for a variety of occupations with supported employment (Rudnick and Gover 2009).

Unlike individually oriented service delivery approaches, community economic development approaches attempt to assertively create employment positions for people with mental illness. Community economic development approaches are based on the assumption that systematic forces of disadvantage marginalize populations of people from the labor market structures. For example, labor market structures are narrowly defined as focusing on profits to the exclusion of attaining broader social objective and sustainability (Yunus 2008). Community economic development uses market strategies to address these broader social objectives.

While there are a range of approaches to community economic development, perhaps the approach that has been most widely used to address the concerns of people with mental illness is the creation of social businesses; commercial organizations that create jobs by producing goods and services that are sold within the broader community (Warner et al. 2006). These are meant to be real businesses that create real employment but hold dual social and economic missions. In some jurisdictions, such as many European countries, the development of social businesses or firms are supported through policies and organizations that have legitimized the approach and enabled the organization of networks and shared learning (see for example, Social Firms UK 2011). The concept of social business is a generic one that includes a range of business structures and models, some being completely owned and operated by individuals with mental illness. In this way, social businesses have been considered to have the potential to enable leadership development within the community of people with mental illness (Morrow et al. 2009).

The merging of employment support with commercial and economic intentions does depend on a structure that effectively integrates business principles and expertise, whether through hiring business professionals within the organization or developing strong partnerships with business communities. In addition, social businesses are designed to create workplace conditions and practices that will enable the ongoing employment of people with serious mental illness. For example, the employees working in the business can be highly involved in determining the nature of the product or service to be sold, hiring processes might include publicizing job positions within mental health services, job schedules may attend to ways to ensure rapid coverage in the case of absenteeism, jobs might be matched to individual capacities and interests and opportunities and policies to ensure advancement within the business might be developed.

There is growing evidence that the social business approach is disseminated widely across many countries (Lysaght and Krupa 2010; Warner and Mandiberg 2006). There is, however, only a limited amount of evidence related to the processes and outcomes of social businesses. Studies that do exist suggest that working in social businesses may strengthen the vocational identity of workers, their sustained commitment to working, and ultimately their intention to move to employment in the broader community workforce (Zamboni et al. 2011). A study of the transition of sheltered workshops to a social business model demonstrated positive outcomes with regard to approximating wages consistent with broader community standards and creating a business economic structure that facilitated the development of new businesses (Krupa et al. 2003). Workplace features of social businesses have been demonstrated to be supportive of individual performance, satisfaction, and well-being, and linked to sustained job tenure (Williams et al. 2010).

The final approach to employment creation support is the growing movement to affirmatively create employment positions for people with serious mental illness within the mental health system. The approach has emerged from an understanding that the mental health system is an economic structure that has historically viewed people with serious mental illness as recipients of mental health services, but not as potential employees within the system. The awareness of advantages of integrating the lived experiences and expertise of people with mental illness into the system has provided additional support for the affirmative creation of these employment opportunities. These initiatives have largely focused on the creation of paid peer-support positions delivered within the mental health system (Davidson et al. 2006). Research on these peer support positions has focused on demonstrating that they can be therapeutically beneficial. Review of these studies suggests that the quality of services does not appear to be compromised by these positions (Davidson et al. 2006; Wright-Berryman et al. 2011). They have indicated the importance of developing clarity about the nature of the role, addressing training and support needs and attending to workplace processes and practices to ensure full integration of the peer-support worker. Other employment options in the mental health field include the development of paid research positions in mental health research (Eastabrook et al. 2004; Henry et al. 2002) and the stand alone mutual support services such as drop-in centers, that may be completely operated by people who have experienced serious mental illness (Clay 2005).

35.6.1.1 Focused Employment Interventions

Focused employment interventions address specific issues identified as challenges to the employment of people with serious mental illness. When offered on their own, these interventions are unlikely to have much impact on employment outcomes, given the array of issues associated with the employment marginalization of people with serious mental illness. However, provided as a complement to comprehensive approaches that create and support employment, they have either been shown to enhance employment outcomes or are based in a theoretical foundation that suggests they have the potential to enhance outcomes. The approaches identified here are not exhaustive, but rather provide a few examples of interventions that target personal, workplace, and mental health system level challenges to employment.

35.6.1.2 Person Level Interventions

Intervention approaches targeting the cognitive impairments experienced by people with serious mental illness have included cognitive remediation, which involves practice exercises to address targeted cognitive skills and the development of focused compensation strategies to minimize the impact of cognitive problems as they occur in daily life. Studies have suggested that the delivery of cognitive remediation interventions in conjunction with employment focused vocational services lead to higher rates of employment when compared to employment services alone (McGurk et al. 2009; McGurk et al. 2005).

35.6.1.3 Workplace Interventions

While the provision of reasonable accommodations for people with a wide range of work related disabilities is protected under law in many nations, a study by MacDonald-Wilson et al. (2002) focused on developing empirical knowledge about the nature of the accommodation practices that enable the employment of people with serious mental illness who receive supported employment services. The top five functional limitations experienced by these employees included interacting with others, learning job tasks, maintaining work stamina and pace, managing symptoms and tolerating stress, and working independently. Frequent accommodations included enabling the involvement of job coaches on the job and in hiring, flexible scheduling, changes in training and supervision, and offering modified job duties. The authors highlight that the presence of an employment specialist can be considered a form of job accommodation for people with mental illness who use ongoing employment supports.

35.6.1.4 Systems Level Interventions

Recovery-oriented initiatives have focused on addressing the low expectations that mental health providers, services, and systems have held with respect to the potential for employment among people with serious mental illness, and subsequently the low priority that these services have been given. Recovery-oriented practice guidelines have been developed to specify the expectations towards service systems and providers to ensure that employment is a priority for service delivery (Connecticut Department of Mental Health and Addiction Services 2006). For example, these practice guideline state that providers practicing from a recovery orientation perspective will not require a client's complete clinical stability before support for employment goals is provided. They will regularly identify opportunities for employment and make these opportunities accessible to service users, and they will offer support and guidance to address challenges related to employment at both the individual and community level. The guidelines serve as a useful tool for the evaluation of the impact of service providers and systems on employment outcomes of people with serious mental illness.

35.7 Implications for Practice

The information presented in this chapter suggests the following implications for practice:

- The labor force attachment of people with serious mental illness can be described as weak. With this in mind, practice should be directed to capturing a range of outcomes that can demonstrate positive changes in labor market attachment, beyond simply considering whether individuals are employed or unemployed.
- Best practices in this field are directed to the rapid placement of people with serious mental illness into real employment opportunities and ongoing employment support directed to these people, their social networks, employers and workplaces.
- An issue that is particularly detrimental to the development and implementation of best practices to enable the full employment participation of people with serious mental illness is the negative attitudes regarding their work potential that continues to permeate the mental health system. Policies, resources and education need to target this problem to ensure that all people with serious mental illness receive messages of hope and potential fundamental to recovery-oriented services and that they can access well-designed employment supports.
- Best practices in employment for people with serious mental illness have demonstrated positive outcomes with respect to their employment, but have raised concerns about the extent to which they have jobs with low social status, vulnerable to poor working conditions, limited opportunities for advancement and meaningful careers. Future practice will need

to develop and integrate, for example, career planning, education and training, benefits and financial planning initiatives with a view to addressing social status issues.

- Given the weak labor market attachment of individuals with serious mental illness, employment supports must be directed to negotiate a comprehensive range of factors that can interfere with employment success. These include, for example, factors that occur at the level of the individual, their families, friends, and other natural supports, employers and workplaces, policy and legal supports, and income structures.
- Beyond working with individuals with serious mental illness to support their employment in existing jobs, the field needs to include initiatives that assertively create employment opportunities within the broader labor market and within the mental health system and social sectors.

35.8 Conclusion

This chapter provides an overview of theory, practice and research related to transitioning people with serious mental illness—the aspiring workforce—to employment in the community arena. The chapter has reviewed forces that have historically marginalized people with serious mental illness from employment. The evolving recovery vision of contemporary mental health services and systems highlights the importance of providing people with serious mental illness the opportunities that will enable them to access and sustain employment. The chapter offers examples of the broad range of interventions and approaches that have developed with a view to addressing a range of challenges. These initiatives are developing with a view to capitalizing on the commitment to employment expressed by people with serious mental illness and the growing evidence suggesting that when individuals are provided with opportunities and supports, employment outcomes are improved.

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Substance Use Disorders, Employment and the Return to Work

36

Lindsey Richardson and Stephen Epp

36.1 Introduction

The use of psychoactive substances, from caffeine to opium, is and has always been a global phenomenon (Gossop 2007; Jay 2010). Each psychoactive substance (i.e., including legal substances such as alcohol) carries with it specific properties and effects (Nutt et al. 2007, 2010), and as such, its own impact on individual, social, economic, environmental, and health-related harm (Adlaf et al. 2005; Chisholm et al. 2006; Degenhardt and Hall 2012). To understand this harm, it is crucial to also recognize that "drug abuse is related to housing is related to health care is related to joblessness is related to poverty" (Shavelson 2001). That is, labor market outcomes are heavily implicated in social, economic, and health-related processes associated with substance use. Negative labor market outcomes such as absenteeism, suboptimal job performance, and joblessness can result from both licit and illicit substance use. Similarly, labor market participation can impact psychoactive substance use in both positive and negative ways.

The challenges of returning to work or staying at work for individuals suffering from substance use disorders or engaging in problematic substance use share a number of common features with those associated with other illnesses, such as impairment or decreased functionality (Frone 2006a, b). However, addiction characterized by compulsive drug seeking and use (Leshner 1997), presents a unique set of challenges for vocational outcomes. It is also embedded within social, physical, economic, and policy contexts (Rhodes 2002, 2009), and the most effective return to work and stay at work strategies may therefore include biological, behavioral, and contextual components.

There are a myriad of models used to guide support for people with employment goals who have substance use issues. The nature of the relationship between client, job (employer), and counselor (either supported by or outside of employment) often defines the scope of work. As a result of the varied practice of substance use vocational rehabilitation, this chapter explores the broader concept of recovery and goal attainment for people with substance use issues in vocational context. It provides an overview of the relationship between drug use and employment, identifies

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key issues at play in this relationship, and outlines various approaches in facilitating positive labor market outcomes among those who use psychoactive substances problematically. For purposes of readability, for the remainder of the chapter, substance or drug use refers to the use of any psychoactive substance, legal or illegal, unless otherwise specified.

36.2 Conceptualizing Work in the Context of Substance Use Disorders

Addiction—as a chronic, relapsing brain disorder (WHO 2004)—has various implications for labor market participation. Importantly, prolonged drug use produces observable changes to the structure and function of the brain that impact judgment and decision making. The direct or indirect impact that psychoactive substances have on the dopamine pathways of the brain, for example, affects different functions including movement, motivation, and reward. Serotonin and glutamate neurotransmitter systems are also among those affected by drug use. These systems crucially influence mood, sleep, learning, and memory (National Institutes on Drug Abuse 2008). As a result, drug use may hamper an individual's ability to seek, obtain, and maintain vocational activity that relies on the functioning of these pathways. Capacities to decrease or cease negative substance use behavior may, as a result of these impacts, be seriously compromised. Expecting someone to "just say no" or "go get a job" is therefore an oversimplified and in many cases unrealistic demand that may be incompatible with the real and consequential changes on the structure and functioning of the brain that result from ongoing use. The impacts of these physiological changes on the vocational outcomes of drug users can be and often are adverse.

While the most intuitive association between drug use and employment points to the impact of drug use on labor market outcomes, the relationship between the two is complex and may also go the other way. Here, the relationship between vocational outcomes and substance use is conceptualized by viewing work as a potentially important determinant of health among drug users. It is well known that over and above individual health behavior, a range of social and economic factors critically influence individual health outcomes and health inequalities in the general population (Marmor et al. 1994; Marmot et al. 2008). Employment is one of the most widely acknowledged social determinants of health and well-being among the general population (Bambra 2011). Research on the relationship between work and health examines how socioeconomic status, labor market outcomes, and unemployment map on to systematic variation in individual health outcomes (Adler and Ostrove 1999; Bartley et al. 2006). This relationship is multidimensional and complex (Cutler et al. 2008; Lahelma et al. 2004). Sociological and social-psychological literature on employment further points a range of nonmaterial benefits from employment that positively influence health and well-being (Jahoda 1982; Warr 1994). Psychosocial factors identified in this literature, such as time structure, stress and positive social interactions in the workplace (Nyberg et al. 2009) are important mechanisms linking work and individual outcomes (Cutler et al. 2008; Matthews et al. 2010). Labor market outcomes as social determinants of health among drug users may not be limited to the material benefits of licit income generation, but may also be connected to features and characteristics of the experience of employment, which also influence patterns of drug use in positive and negative ways.

Given that the relationship between drug use and employment may be bidirectional, with drug use potentially impacting labor market outcomes and the experience of work likewise impacting substance use patterns, approaching addictions in the context of the return to work framework necessitates an acknowledgement that both are situated within and interdependent on broader relationships. Substance use disorders relate to a complex interaction between the biological, psychological, social, environmental, and spiritual aspects of a person's life. Changes to one of these areas may cause changes to the other areas, and subsequently to patterns of drug use and related behavior. In particular, co-occurring mental illness, exposure to high levels of stress, or traumatic events may greatly influence the initiation or intensification of use (Brown and Wolfe 1994; Clark et al. 2001; RachBeisel et al. 1999).

Because of the complexity of those factors that influence drug use, addiction treatment may be crucially important to improving drug use as well as labor market participation. However, no single treatment, counseling or rehabilitation approach is appropriate or will be successful for all individuals. Success, goal attainment, and, ultimately, recovery often involve progress made in processes related to many areas of a person's life, not just a change in substance use.

36.3 Facts and Figures

The following section outlines the prevalence of substance use, magnitude of some health-related harm attributed to substance use, and economic costs of substance use from a vocational perspective. The use, harm and cost patterns described below emphasize how the toll from substance use has a significant and substantial vocational dimension.

In 2005, global alcohol consumption was estimated at 6.13 l of pure alcohol per capita annually, although there is considerable regional variation, with this figure estimated to be 12.18 l per capita in Europe, 2.20 in Southeast Asia, and 8.67 in the Americas (WHO 2011). The United Nations Office on Drug and Crime (UNODC) estimates that, in 2009, between 149 and 272 million people, or 3.3–6.1 % of global population aged 15–64, used illicit substances at least once in the previous year (UNODC 2012). Substance use is pervasive across geographic region and cultures, and undertaken by a significant proportion of the global population.

Individuals experience both benefits and harm from the substance use described above, though vocational and policy perspectives often focus on substance-related harm. These harms include, in the case of alcohol, disability resulting from accidents, chronic health consequences (e.g., cancer and cardiovascular disease), and alcohol-related disability (Rehm et al. 2003a, b), all of which have consequences for vocational participation. In 2000, alcohol use was estimated to have been responsible for 3.8 % of global mortality and 4.6 % of the global disability-adjusted life years (DALYs), or the number of years of life lost to premature mortality or disability (Rehm et al. 2009). The similar cost of substance-attributable morbidity and mortality for illegal drugs has been estimated at 20 million DALYs in 2010, or 0.8 % of global all-cause DALYs in 2000 at 0.4 % of total global mortality (Degenhardt et al. 2013).

Substance use occurs among people from all sociodemographic and cultural backgrounds (Devereux 2008; Jay 2010) and across the socioeconomic spectrum (Pierce 1999; Reuter et al. 1990). Research indicates that most people who use both legal and illegal substances are employed. For example, in the USA, of the 20.2 million current illicit drug users aged 18 or older in 2010, 13.3 million, or 65.9 %, were employed (Hersch and Cook 2012). Similarly, among 56.6 million adult binge drinkers, 42.3 million, or 74.7 %, were employed. Among 16.5 million heavy drinkers, 12.2 million, or 74.0 % were employed (Hersch and Cook 2012). Despite indications that the majority of individuals who use psychoactive substances also hold jobs, the work-related costs associated with substance use are staggering.

Lost productivity is commonly considered to be one of the most significant costs resulting from use (Heien and Pittman 1993; Rehm 2006). They are considered to include: (1) foregone economic contributions because of premature mortality and disability, (2) absenteeism, (3) impaired productivity due to substance related illness, injury or disability, and (4) crime-related costs, including the incarceration of perpetrators, or the costs to victims of substance-related crime (Bouchery et al. 2011). In the USA in 2006, the estimated costs of lost productivity for alcohol misuse was estimated at $161.3 billion (USD), or 72.7 % of the total (Bouchery et al. 2011). This figure was $128.27 billion (USD), or 71.1 % of the total costs attributed to drug misuse. In Canada in 2002, $24.3 million (CAD), or 61 % of the total costs of substance use have been attributed to lost productivity (Rehm 2006). The global burden of substance-attributable morbidity and mortality and related employment and productivity-related costs are considerable and global in scale.

36.4 Existing Research on Substance Use and Labor Market Outcomes

The relationships between substance use and labor market outcomes are often substance specific. Some substances are integrated into the daily rhythms of the workday or cultural and social practices around work, such as the common practice of demarcating the end of the workday with an alcoholic beverage with colleagues (Gusfield 1987). These practices have been associated with strengthening team solidarity in the workplace, serving important social functions in the lives of employees and developing of firm or industry specific networks (Brewis and Grey 2008; Janes and Ames 1989; Wood 2011). Despite the integration of or complementarity between substance use and employment practices, attention on this relationship from academic, policy, and therapeutic perspectives generally focus on how substance use may negatively affect labor market outcomes. Research on these effects is summarized below.

36.4.1 Labor Market Outcomes for Alcohol

The relationship between alcohol and work is complex and for some labor market outcomes, nonlinear. For example, there is considerable debate surrounding the common finding that even high levels alcohol consumption, compared to abstinence, is associated with increased income (Bray 2005; MacDonald and Shields 2001; Mullahy and Sindelar 1996; Zarkin et al. 1998a). Results are more consistent where the outcome of interest is unemployment or non-employment where problem drinking has been repeatedly associated with unemployment and labor market non-participation (MacDonald and Shields 2004; Mullahy and Sindelar 1996; Terza 2002). Alcohol misuse has also played a demonstrable role in job loss or sustained unemployment (French et al. 2011). However, not all studies find a negative relationship between high levels of alcohol use and labor supply (Feng et al. 2001).

Research has also pointed to the potentially negative impacts of job loss or unfavorable work environments on alcohol use patterns (Seeman et al. 1988; Wiesner et al. 2005), noting that job loss is often associated with increases in individual levels of alcohol consumption (see Catalano et al. 1993 for a review). They have also found that the reasons for changes in drinking behavior associated with employment experiences are complex and multifaceted (Head 2004; Martin et al. 1996; Wilsnack and Wilsnack 1992). These studies raise an important aspect of the dynamic relationship between work and employment: that while the harmful use of alcohol and other substances may increase the probability of suboptimal labor market outcomes, the threat or experience of job loss may also result in increased substance use.

36.4.2 Labor Market Outcomes, Illegal Substances

In the context of return to work and the maintenance of employment, a number of studies examine how drug use impacts work-related outcomes such as income, employment tenure, and labor market participation in the general population. Notably, the small number of data sources that contain both employment and drug use information limits this type of analysis. Generally, these studies hypothesize that substance use and labor market outcomes will be inversely related. However, research on the relationship between labor market outcomes and psychoactive substance use suggests considerable variation across substances, contexts, and levels of use.

36.4.2.1 Income

As with studies examining the impact of smoking and alcohol use on income levels, the relationship between illegal drug use and income is unclear. Using the US National Longitudinal Survey of Youth (NLSY), Register and Williams (1992) and Kandel and Davies (1990) have found no or inconsistent relationships between cannabis use and wage and no association between wages and cocaine use. Both Kaestner (1991) and Gill and Michaels (1992) found increased wages with substance use, and studies using the British Crime Survey (BCS), found no relationship between hard drug use and wages (MacDonald and Pudney 2000a).

36.4.2.2 Levels of Employment

Similarly, studies that examine the impact of illegal drugs on the amount that individuals work, or their levels of employment show similarly inconsistent results. Bray et al. (2000) suggested that symptoms of substance dependence are associated with fewer hours worked among men but not women using the National Household Survey on Drug Abuse (NHSDA). Zarkin et al. (1998a) analyzed adjacent cross sections of the NHSDA from both 1991 and 1992. They found that substance use has little effect on the number of hours worked and inconsistent results among young men who smoked cannabis in successive years.

36.4.2.3 Job Tenure

The results of studies that examine the relationship between drug use and employment tenure are more consistent with an anticipated negative impact. These include findings of negative associations between demonstrated a negative association between cannabis or cocaine use and job stability (Kandel and Davies 1990); higher levels of job turnover (Kandel et al. 1995); increased job mobility and job separation (Kandel and Yamaguchi 1987). These studies suggest that drug use may negatively affect job stability, though they are not causal analyses.

36.4.2.4 Unemployment

The majority of studies examining the relationship between drug use and labor market outcomes focus on unemployment. Again, findings in this area are not consistent (see Henkel 2011 for a review). Kaestner (1994), for example, demonstrated different results in longitudinal and cross-sectional analyses. Kandel and Davies (1990) found that cocaine use both increases the number of spells in unemployment and the duration of these spells, and DeSimone (2002) found that both marijuana and cocaine use significantly reduce the probability of employment. Gill and Michaels (1992) found that while drug users have lower employment levels than non-drug users, a sub-sample of "hard drug" users (identified as cocaine, heroin, and psychedelics) do not. Other studies have supported this analytic distinction (Alexandre and French 2004; Bray et al. 2000; DeSimone 2002). MacDonald and Pudney (2000a, b, 2001) differentiated between "hard" and "soft" drug use and suggest that past and current hard drug use is significantly and negatively related to employment. French et al. (2011) separated chronic from non-chronic use and found different results for each. Bray et al. (2000) demonstrated that poly-substance users are less likely to be in employment than single-substance users. These mixed results have led to conclusions that there is little evidence of a robust labor supply–drug use relationship (Kaestner 1998). However, key distinctions between different substances and types of use (DeSimone 2002), including sociodemographic specificity that considers career stage (Buchmueller and Zuvekas 1998; Kandel et al. 1995; MacDonald and Pudney 2001), gender (Hser et al. 2003; Neale 2004; Platt 1995), ethnic differences (Hermalin et al. 1990; Platt 1995; Sterling et al. 2001) may provide clearer understandings of variation in labor market outcomes across different subpopulations of people who use drugs and elucidate the potentially important role that sociodemographic disadvantage may play in labor market outcomes among people who use drugs.

The lack of a robust labor supply–drug use relationship may also be attributable to considerable variation in the way that both drug use and employment are measured. Employment measures range from a single hour of paid labor in the past year (DeSimone 2002), working part time, being a student or attending a vocational training (Suffet 1999), or full time employment (Koo et al. 2007; Buchmueller and Zuvekas 1998). Indicators of drug use are also inconsistent across studies, with significant variation in drug use intensity or frequency measures (Buchmueller and Zuvekas 1998; Anthony and Helzer 1991; Kandel 1991). Differences may have considerable effects on statistical outcomes, necessitating caution when comparing results.

The use of nationally representative samples may further make it difficult to identify clear relationships between drug use and employment. These samples may not provide sufficient subsamples of individuals for whom the effects of this relationship are likely to be more pronounced, such as people with more intensified, prolonged use, or poly-substance use. A select number of studies compared the characteristics of employed and unemployed drug users using data from community recruited samples (Atkinson et al. 2000; Johnson et al. 2001; Koo et al. 2007; McCoy et al. 2007; Richardson et al. 2010). These studies approached the employment–drug use relationship by identifying attributes that are predictive of employment. The intention is that knowledge of these factors might facilitate the development of supports that will increase the employment capacity of unemployed or non-employed, substance using individuals (Koo et al. 2007). While results from these studies cannot be generalized, they provide a means for comparing labor market outcomes within drug using populations and specific drug use contexts.

Despite the literature on employment and drug use, studies of returning to work or entries into employment among drug users are extremely rare. An area requiring further inquiry is therefore research that examines return to work while differentiating between drug users at different stages of addiction and labor market involvement. For example, among drug injectors, community-based analyses have focused on differences in employment entry rates across different types of treatment compared with those who are not in treatment (Richardson et al. 2012a, b). The role of treatment in facilitating the return to work among people who engage in harmful substance use is an important question, and it is to this question that we turn next.

36.5 Return to Work as an Addiction Treatment Outcome

With a few exceptions, studies on return to work generally occur in the context of addiction treatment. Employment entry is commonly used as an important outcome indicating successful treatment in the context of addiction treatment and recovery (Magura 2003; Platt 1995). The tendency in the therapeutic literature is to frame “antisocial” behavior (drug use) as inversely related to “prosocial” behavior (employment). The focus on returning to work after addiction treatment centers not only on the provision of a legal income but also on the premise that work structures daily routines and discourages ongoing, harmful drug use (Magura et al. 2004; Vaillant 1988). There is therefore both a symbolic and real importance of returning to or maintaining work for those who struggle with substance use disorders. An understanding of the relationships between the conceptualization, design and implementation of addiction treatment and individual vocational objectives and outcomes is therefore paramount.

Research focusing on the relationship between addiction treatment and employment has observed correlations linking existing employment or previous work experience to improved treatment outcomes (Robins et al. 1975; Vaillant 1973), such as longer term abstinence, lower relapse rates, and improved treatment duration (Castellani et al. 1997; Hser et al. 2001; Reif et al. 2004). Research has also focused on the ability of addiction treatment to facilitate positive labor market outcomes. Characteristics corresponding with sociodemographic disadvantage along lines such as ethnicity, gender, human capital, age, and expectations of labor market success are differentially associated with employment among methadone maintenance therapy (MMT)[1] and cocaine treatment clients (Hermalin et al. 1990; Sterling et al. 2001).

Post-treatment employment success rates in research studies vary, but are generally very low among addiction treatment clients. This range may be attributable to the wide range of treatment modalities, substances and evaluation designs that have been examined (Magura et al. 2004; Platt 1995). There has also been disproportionate focus on heroin users enrolled in MMT, a lack of non-treatment enrolled individuals available

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[1] MMT is a long acting synthetic opiate agonist used as substance replacement therapy that, when taken daily, blocks opiate receptors and prevents people who regularly use opiates from going into withdrawal while at the same time not producing the euphoric effects associated with their consumption (Mattick et al. 2009).

for comparison, data limitations, and a lack of robust longitudinal studies (Hubbard et al. 1989; Price et al. 1991; Reif et al. 2004; Sterling et al. 2001). Selection effects may further limit the generalizability of results to a broader treatment–employment link. That is, the decision to enter treatment indicates a willingness to address problematic drug use that may predispose people to engagement with social institutions. As such, treatment enrolled individuals may be at a particular stage of the addiction cycle (Platt 1995), limiting the ability to generalize results to a broader treatment–employment link.

The treatment–employment link has also been explored in the context of vocational rehabilitation (VR; Magura and Staines 2004). Here it is important to note that the vocational support needs of those enrolled in addiction treatment may be distinct from other vocational services clients. Similar to other mental health conditions, substance use disorders have an undulating functional course, with potentially significant variation across periods of high and low function. It is therefore difficult to establish at the outset, or even at the completion of addiction treatment, the eventual functionality or overall employment potential of clients. There are no guarantees that individuals will not relapse or experience setbacks in their substance use management. There is also a risk that individuals will take premature steps toward employment that may expose them to triggers or situations for which they are not ready. The availability of vocational services for those facing addictions is also a potentially serious issue. A recent study examined VR services (West 2008), noting the inadequate provision of these services despite repeated calls for them and evidence of their cost-effectiveness (Shepard and Reif 2004).

36.6 Micro, Meso and Macro Level Issues in Addiction and the Return to Work

Consistent among the above studies that examine the relationships between substance use, addiction treatment, and employment is their focus on the individual. While the individual plays an important role in their own labor market and drug use trajectories, people who use drugs are also influenced—in both negative and positive ways—by wider contextual factors. Ecological models of human development and behavior have long acknowledged the influence of social, physical, economic, institutional, and policy components of the broader environment on individual behavior and outcomes (Bronfenbrenner 1977, 1979; McLeroy et al. 1988; Rhodes 2002). In this section, we examine influences on the relationship between substance use and individuals' ability to both return to work and stay at work at the micro-(individual), meso-(environmental), and macro-(structural) levels.

36.6.1 Micro-level Influences on the Return to Work

Individuals with addictions, substance use disorders or who use drugs problematically face challenges related to their mental and physical health at the micro-level. A number of theoretical approaches have been taken to attempt to explain the biological aspects of addiction (Alexander 2010). A detailed analysis of these approaches is beyond the scope of the current chapter. Nevertheless, some understanding of the etiology of drug use and linkages between specific drug use patterns and individual behavior and psychological states may be an important starting place for vocational rehabilitation and developing an understanding of the multiple individual-level factors associated with substance use.[2]

Micro-level influences on the return to work and staying at work span individual level factors that are perceived to and often do alter employment outcomes. A major micro-level influence is the health impacts of substance use. Health issues that may impact employment entries specific to substance use tend to fall into four categories: (1) the acute toxicity of the substances and related effects, including overdose, (2) the acute effects

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[2] A useful handbook for clinicians describes common symptoms associated with and potential consequences of specific types of substance use (Glenn, M., Huber, M. J., Keferl, J., Wright-Bell, A., & Lane, T. Substance use disorders and vocational rehabilitation - VR counselor's desk reference. Rehabilitation Research and Training Center on Substance Abuse, Disability and Employment).

of intoxication unrelated to toxicity, such as accidental injury, (3) the development of dependence on a substance and (4) the adverse health consequences of ongoing chronic, regular use, including chronic disease, blood-borne bacterial and viral infections, and mental disorders (Degenhardt and Hall 2012). Mental disorders are particularly salient given their significant association with being unemployed or underemployed employed (Corcoran et al. 2004; Jayakody et al. 2000) and the challenges of co-occurring mental health disorders (Kessler et al. 2005; RachBeisel et al. 1999; Villena and Chesla 2010). Each of the above categories may influence labor market trajectories in different ways. For example, an accidental injury may result in the abrupt suspension of labor market activity or job loss, while drug-related chronic disease may erode individual labor market participation capacities over time, bringing consequential changes in individual earning capacity as a result.

Among the most intuitive of the health problems impacting individual capacity to work arising from substance use are issues of physical and cognitive impairment. Separating use from physical from cognitive impairment are important distinctions in this regard. The use of a substance refers to the "prevalence or frequency of using a substance over some fixed period of time or the quantity of a substance consumed on a typical occasion of use" (Frone 2006b). Physical impairment refers to both more immediate and the long term impacts of prolonged use, such as such as intoxication, drug-induced psychosis, or cirrhosis (Nutt et al. 2010). Cognitive impairment, conversely, refers to the "irreversible central nervous system impairment due to the direct pharmacological action of a substance resulting in various behavioral, cognitive and affective changes" (Frone 2006b). These changes may include increased daily discounting, behavioral inhibition or inattention (De Wit 2009), or decreased cognitive flexibility, memory, or psychomotor speed (Mintzer et al. 2005).

Both types of impairment may interfere with an individual's ability to perform work-specific tasks. It is important to note, however, that these impacts will be highly variable. This is firstly because the impacts of drug use on work are substance specific (Nutt et al. 2010). For example, the immediate effects of alcohol have been shown to negatively impact concentration, coordination, reaction time, risk taking behavior, decision making, and planning; those of opioids may produce mood effects including "mental clouding," calmness, and drowsiness (Kelly et al. 2004). Secondly, these impacts are also individual specific. Because of individual capacities to develop tolerance to the pharmacological or behavioral effects of a drug, use does not necessarily imply impairment (Frone 2006b; Nutt et al. 2010). While tolerance may therefore mitigate the acute physical impairment that may interfere with work, this tolerance may also be indicative of individual dependence on a substance.

Consideration of impairment as well as dependence is therefore crucial when assessing individual capacities to undertake vocational activity. Studies of dependent substance users have repeatedly noted that even chronic, high-intensity use may "not [be] about getting high, it's just getting normal" (Draus et al. 2010, p. 859). Individuals may therefore be engaged in high levels of drug or alcohol seeking behavior that are driven principally by having a sufficient supply of a substance in order to avoid withdrawal symptoms. The instability created by dependent substance use may therefore rest "fundamentally on the effects which follow when the drug is removed, rather than on the positive effects which its presence in the body produces" (Lindesmith 1947). Drug and alcohol seeking behavior may therefore play a considerable role in shaping the daily activity of dependent users (Weiss et al. 2001) and their ability to work.

Both impairment and dependence may directly interfere with practices that are crucial to the return to work or the maintenance of a job. These include issues related to productivity and safety at work, and may also relate to inconsistency in terms of punctuality, absenteeism and reliability. The Substance Abuse and Mental Health Services Administration (SAMHSA) in the US states that individuals who have substance abuse problems tend to have twice as many lengthy absences as other employees, use more sick days and benefits, come to work tardy three times more frequently, file more workers' compensation claims and be involved in more accidents in the workplace (US Department of Health and Human Services 2001). It is important to note, however, that many individuals who use drugs are capable of and do hold regular employment without diminished performance or capabilities.

Other micro-level factors that contribute to the return to work or the maintenance of work are associated with individual level capacities. Prior educational attainment and work experience, for example, equip individuals with resources that facilitate successful job acquisition. The impact of these characteristics and capacities on employment outcomes has not been thoroughly studied among people who use drugs, though human capital theory maintains that individuals with greater individual assets, such as knowledge, skills, training, and motivation have greater productive capability. A lack of these attributes, and poor educational attainment in particular, has been commonly cited as a barrier to employment among the general population and among drug users (Danziger and Seefeldt 2003; Platt 1995). Among people who use drugs, the presence of these attributes may make it easier to leverage their human capital into reemployment, serving as a source of resiliency, a point to negotiate mutually acceptable arrangements with an employer, or decreasing the long-term consequences of leaving employment.

36.6.2 Meso-level Influences on the Return to Work

Meso-level factors that may have a bearing on the return to work or staying at work among individuals with substance use disorders refer to those factors that involve the social and physical environment to which individuals are exposed over time. These include, but are not limited to, environmental exposures that connect work and health in the general population. This relationship is well documented, spanning topics such as exposure to workplace health hazards (Bambra 2011), material deprivation associated with suboptimal labor market outcomes (Bartley et al. 2006), and psychosocial pathways that link the work environment and work tasks, such as levels of individual control or effort requirements in the workplace, and their relationship to labor rewards, with individual physical and mental health (Karasek 1979; Siegrist 1996).

A range of behaviors, activities, circumstances, and events are specific to different kinds of drug use (Rhodes 2002, 2009). Drug use scene involvement, for example, play a crucial role in shaping the health and risk trajectories of people who use drugs (Curtis and Wendel 2000; Hough and Natarajan 2000; Kerr et al. 2007) and the likelihood of returning to work (Richardson et al. 2013). Drug scenes have been described elsewhere as distinct areas, usually in the inner city, where there are high concentrations of people who use drugs and drug dealing (Curtis and Wendel 2000; Hough and Natarajan 2000). These areas host socio-spatial networks within which the day-to-day activities of people who use drugs, such as securing money, shelter, and drugs are situated (Bourgois 1996; Fast et al. 2010; Maher 1997). These scenes and their associated networks matter for individual drug use intensity and risk behaviors (Latkin et al. 2010; De et al. 2007), as well as for opportunities for work and employment opportunities, among other complex socioeconomic impediments (Jencks and Mayer 1990). Conversely, there can also be benefits from exposure to positive social environments. The efficacy of alcoholics anonymous is often linked to improvements to individual social connections and capital that may accompany participation in 12-step programs (Laudet and White 2008; Zajdow 1998). Where there is complementarity between a 12-step meeting's social environment and a participant, positive reinforcement can be developed among peer groups that may encourage ongoing attendance and participation. It may also create social ties away from those that may have previously been embedded in drug use environments and toward other social and institutional ties, which include the work promoting social contacts.

The physical environment may also play an important part in facilitating or hindering individuals in their labor market objectives. In particular, access to stable housing (or a lack thereof) has been repeatedly identified as an important contributor to socioeconomic vulnerability and successful labor market engagement (Anderson et al. 2007; Richards 1979). The association of unstable housing with, health-related risk behavior and suboptimal labor market outcomes (Beardsley et al. 1992; Suffet 1999) suggests that it is a critical aspect of an individual's physical environment that affects obtaining and holding a regular job.

The social and physical environment is inextricably linked to resource access, social norms, health-and employment-related behavior. Individual capacity and willingness to engage or maintain engagement in the labor market cannot therefore be assessed, supported or facilitated without considerations of the meso-level context. It is important, therefore, when designing vocational programming for clients engaged in harmful substance use that consideration of the meso-environment play a prominent role.

36.6.3 Macro Level Influences on the Return to Work and Staying at Work

Structural-level influences include policy, regulatory, and legal contexts; local, regional, and national economic conditions; as well as inequalities and inequities that manifest along demographic lines of race, ethnicity, class, and cultural organization (Bronfenbrenner 1977; Carlson 1996; Doyle 1979; Marmor et al. 1994; Marmot et al. 2008; Rhodes 2002). While a comprehensive description of the various structural forces that may influence the return to work and staying at work among individuals who use drugs, have substance use disorders or face addiction is beyond the scope of the current chapter, examples with particular relevance to addictions, employment, and the return to work demonstrate how individuals' actions and reactions are "situationally and structurally dependent on the environments in which they occur" (Rhodes 2002, p. 88).

36.6.3.1 Job Availability and Employment Opportunity

The first relates to economic conditions that adversely impact employment opportunities. In times of economic hardship, the absence of work opportunities may impact both individual socioeconomic resources and drug use outcomes. For example, Johnson et al. (1985) observed that the probability of having a job in inner-city neighborhoods was essentially nonexistent even when individuals were not using drugs, and point to a systemic failure to provide enough jobs for all citizens. Similarly, others look to the restructuring of the North American economy away from manual and manufacturing related jobs, combined with a shift away from rehabilitative social service provision towards more punitive models for people who use drugs, as playing a crucial role rendering entire categories of manual workers obsolete and without the ability to adapt to economic change (Bourgois and Schonberg 2009; Draus et al. 2010).

The interaction among social and economic deprivation, the consequences of unemployment, and opportunistic drug market forces configures socioeconomic conditions surrounding drug use in deprived areas and engenders considerable pressures away from labor market participation or returning to work. The macro-level, often overlapping, structural drivers of drug use and non-employment point to the importance of supra-individual and non-health oriented interventions to promote improvements to both drug use and employment outcomes. Examples of these types of interventions may include shifts in housing policy (Pearson 1987) and microeconomic and community development initiatives (Blankenship et al. 2000; Hawkins 2001).

36.6.3.2 Unemployment Traps

A second example of a macro-level factor impacting the return to work or staying at work relates to the incentives created by social welfare structures and the role of unemployment benefits (Devine and Kiefer 1993). Social assistance is in many cases designed to provide a basic level of income, but not be so generous as to decrease individual incentives to return to work and stay at work, even if employment is low paying (Atkinson and Micklewright 1991). The debate over the role of unemployment benefits in promoting a return to work is, however, unsettled. There appears in some cases to be a positive relationship between unemployment benefits and unemployment duration, though this effect is affected by labor market conditions and work characteristics (Devine and Kiefer 1993). Conversely, a number of studies demonstrate very small or nonexistent changes to reemployment probabilities with increases in benefit levels, as the end of benefit eligibility nears, or if benefit eligibility is extended (Layte and Callan 2001; Spiezia 2000; Tsebelis and Stephen 2001). Additional features of unemployment benefits relevant to labor market behavior such as retraining and search requirements may also play roles for people who use drugs in their efforts to return to work or maintain employment. Benefits may therefore have positive or negative impacts on reemployment incentives that may depend on qualifying conditions and institutional relationships (Atkinson and Micklewright 1991). Finally, more recent studies note unintended consequences of toughening the benefit regime; more stringent eligibility criteria or decreased levels of benefit may push those on "margins of crime" toward increases in criminal behavior (Calvó-Armengol et al. 2007; Machin and Marie 2006).

Further, individuals who are in receipt of social assistance may be entitled to benefits that are contingent upon their continued receipt of such assistance. These benefits may be medical in nature and may involve access to services that are crucial for mitigating the harm from drug use or working towards drug use cessation and employment (re) uptake, such as methadone maintenance therapy or addiction treatment services. Other benefits tied to social assistance receipt that are important for the acquisition and maintenance of employment, such as access to social housing or housing-related supplements, may also be in effect. Because these benefits are tied to social assistance receipt and eligibility for them may cease upon the resumption of regular employment, a considerable disincentive to ending social assistance can be created. Indeed, an individual's quality of life may decrease upon the initiation of employment because, with low paying jobs in particular, an individual's effective income or material security on social assistance may be higher than that in employment. The design of social assistance programs is therefore of crucial importance if they are strike a balance between providing a basic level of access to socioeconomic resources and health services and encouraging individuals to participate in the labor market. The expansion of tied benefit eligibility to those in low income employment may prove crucial in optimizing this balance. There is, however, little research on the impact of such macro-level "unemployment traps" (Neale and Kemp 2009) on incentives to return to work or maintain work. This may be a fruitful area for future research.

36.6.3.3 Compatibility Between Addiction Treatment and Work

A further example of macro-level factors that may influence the return to work or the maintenance of a job for people who use psychoactive substances is the relative compatibility of essential health or addiction treatment services with seeking, obtaining, and maintaining a job. These incompatibilities may relate to the time requirements of accessing a job, and that a new or existing job may not afford sufficient time flexibility to both access a service and maintain a job. They may also surround the geographical compatibility characterized by the distance between a service access point and a place of employment. For example, the attendance requirements of methadone maintenance therapy may create considerable obstacles to labor market participation for these reasons (Richardson et al. 2012b). Methadone, in many contexts, is dispensed at a single pharmacy in single doses under the supervision of a pharmacist on a daily basis (Anderson and Warren 2004). Adherence to regulations, and the time and geographical limitations implicated in this adherence, may prove to be highly consequential to labor market outcomes, particularly in environments where MMT is not widely available. Other treatment modalities require that individuals live in a sequestered environment.

These may involve the severing of a work relationship, or the disruption of social network ties that may be instrumental to finding a job.

The regulations or requirements of addiction treatment enrolment may be designed to support important purposes. For example, the rules governing the provision of MMT are intended to prevent individuals from diverting methadone for either inappropriate use by MMT clients or use by individuals for whom it was not prescribed (Ritter and Di Natale 2005). Nevertheless, such precautions, regulations and restrictions should be weighed against the potentially important impacts that they have on individuals' ability to engage in the treatment and rehabilitation process generally, and on their ability to seek, obtain and maintain employment in particular. The impediments to treatment enrolment and retention or the social and economic functioning of people who use psychoactive substances are paramount to the promotion of returning to or staying at work, and should figure prominently in the design of regulations, programs, or vocational or employment supports. Any adjustment that increases, for example, the time or geographical compatibility of employment and addiction, health, or social support services could have potentially positive impacts on the labor market participation of people who use drugs.

36.6.3.4 Employer Stigma and Discrimination

Finally, the stigma and discrimination directed towards people who use drugs exacts a considerable toll on their ability to obtain and maintain employment. The employment-specific consequences of the stigma of having a history of a substance use disorder include individual devaluation or decreases in perceived competency, trustworthiness, productivity, or moral sufficiency; impacts on personal relationships, quality of life, health, and safety; the exacerbation of social inequalities; and disproportional marginalization or rejection (Link et al. 1997; Murphy and Irwin 1992; Room 2005). The anticipation or experience of stigma from employers or employees may dissuade individuals from accessing potentially crucial addiction-related services, as it may be that accessing such may, for example, increase the probability that an individual may be forced to disclose their treatment status in order to access leave provisions, employer-provided benefits or to keep their job. Stigma from current or potential employers or coworkers, whether or not active drug use is ongoing, has been previously identified as a considerable obstacle to employment (Crisp et al. 2000; Dillon 2004; Gold 2004). When combined with the negative impacts of stigma of unemployment (Biewen and Steffes 2010; Heckman and Borjas 1980; Ho et al. 2011), which identify a long lasting, increased probability of unemployment for those who report previous unemployment, the macro-level and structural impacts of stigma from drug use and unemployment may be scarring and profound.

A broad spectrum of micro-, meso-, and macro-level factors may influence the character and intensity of substance use as well as the impact of such use on the return to work or maintenance of work. The various individual, environmental, and structural processes and exposures described here are far from a comprehensive examination of those pressures away from and obstacles to labor market participation among people who use psychoactive substances. This discussion does, however, point to the complexity faced by both individuals who aim to return to or maintain employment and those who seek to support them in this endeavor. The remainder of this chapter focuses on a sample of strategies to support vocational outcomes among individuals with substance use disorders or addictions.

36.7 Returning to Work, Staying at Work, and Substance Use Disorders

Returning to work and staying at work for those with substance use disorders or substance dependence can seem a daunting and overwhelming task given the micro-, meso-, and macro-level factors that exert pressures away from labor market participation. There are a range of potential strategies, supports, and programs to encourage the return to work or job retention, most of which target micro- or meso-level factors. In practice, substance use guidelines for and theories about promoting change as well as counseling and vocational rehabilitation support generally occur at the micro-level of the individual. Consideration of the social, and physical and structural environment may also be at play, but are experienced in unique ways by each individual. It is therefore crucial that clinicians individually assess each client, as well as relevant contextual exposures. Vocational counseling, programs and return to work interventions that focus uniquely on the micro-level will inevitably face considerable limitations.

36.7.1 Types of Addiction Treatment

There exist a range of available addiction treatment options. Probably the most common type of addiction treatment is *outpatient or community based treatment*. Typically, this type of treatment is comprised of weekly one-on-one or group sessions delivered by either a professional or non-professional peer. Outpatient or community-based treatment includes 12-step programs such as Alcoholics Anonymous or Narcotics Anonymous. Another type, *residential treatment*, involves relocating individuals to an environment specifically focused on drug use cessation and significant life change. Residential treatment environments are generally abstinence focused, and can range in duration from 2 week to a period of a number of years.

Hospital based treatment, the most intensive and expensive, is reserved for those who need medical monitoring or care. This approach may be appropriate for individuals undergoing an involved or protracted withdrawal experience, drug-induced psychosis, or concurrent mental health crisis. This type of program is typically short (i.e., up to 30 days), and generally involves discharge to community, outpatient or residential treatment. Finally, *harm reduction* interventions, including substance replacement therapy, shift the acquisition of psychoactive substances away from illegal drug markets toward medical prescription. These may include methadone maintenance, buprenorphine or extended-release naltrexone.

36.7.2 Occupational and Vocational Perspectives on Addiction Treatment

The approaches described above focus on achieving substance use goals of abstinence or harm reduction. However, there are recognized benefits to promoting treatment goals that incorporate broader perspectives on health and well-being, including vocational activity as a critical component of treatment. The following section outlines principles and guidelines of this approach that are designed, among other things, to enable the return to work or staying at work.

36.7.2.1 Occupational Approaches to Substance Use Disorders

Occupational approaches to rehabilitation start with the objective of matching therapeutic engagement with an individual client's stage of recovery in order to promote incremental change towards broader life goals, including vocational objectives. The recognition that positive change in one area of life impacts other areas enables the therapist to identify and work in domains where there is space to explore change. Various models in the literature describe "stages of change" models. However, it is crucial to acknowledge that rehabilitation is an individual process that will involve progress and setbacks, both of which provide opportunities for growth and learning, with no deterministic formula that is universally appropriate for all situations. For example, Prochaska and DiClemente (1982, 1983) developed a "transtheoretical" model of change to describe the change process. This model gained traction because of it effectively matches client's readiness to change with activities jointly planned by both the client and their professional supports. The language of this model involves progression from *precontemplation* to *contemplation* to *preparation* to *action* to *maintenance* (Prochaska and DiClemente 1982). With steps forward and back across these stages, the client and clinician can match activities accordingly.

Motivational interviewing is another evidence-based model emphasizing individualized treatment plans with a focus on client motivation (see Dunn et al. 2001; Rubak et al. 2005; Vasilaki et al. 2006 for reviews). The Decisional Balance Tool is commonly used as part of motivational interviewing to assess client readiness for change. This tool involves constructing lists of the benefits and drawbacks of the status quo, and doing likewise for individual change. Particularly important in this assessment is the non-judgmental exploration of the client's perceived consequences of the status quo and of changing substance use activities. As the client develops awareness of the micro, meso, and macro factors influencing their activities, the client shifts their perspective from an external to internal locus of control as they start to appreciate their role in individual change. In these models, there is no assumption that the client needs to abstain from drugs or alcohol to move forward in the rehabilitative process. The drug is not viewed as the problem, but rather a symptom of a problem. The emphasis of rehabilitation is therefore in identifying and working to resolve the root cause of problematic substance use.

36.7.2.2 Goals of the Rehabilitative Process from a Vocational Perspective

The ultimate goal of substance use rehabilitation is improved functioning. Goal attainment, and, ultimately recovery, relates to each of the biological, psychological, social and spiritual domains, not just a change in substance use. Although abstinence from substance use may be an "ideal" outcome of rehabilitation, gains, goal attainment and functional improvement are possible without cessation of substance use. There may be certain employment contexts or conditions where abstinence from substance use may be mandatory, particularly in security or safety-sensitive roles (Tunnell 2004). However, abstinence does not denote recovery, but is often considered a helpful step towards the achievement of goals in the biological, psychological, social and spiritual spheres. Absence from substance use, for example, is often coupled with broader goals surrounding health and well-being.

Vocational and employment goals are often conceptualized as an outcome of treatment (Magura 2003; Platt 1995), but the Substance Abuse and Mental Health Services Administration (SAMHSA) recommends exploring and planning for vocational outcomes at *every* stage in treatment (US Department of Health and Human Services 2001). Clinicians are able to anchor long term employment goals and hope for a better quality of life through the cultural lens of having a job and being part of the productive fabric of their community, based on each client situation and need to correspond to an intersection between the individual's job preferences, their skills, and the job. The stages and process by this goal setting varies across individuals. Some will go through treatment, gain control over their substance use (often abstinence), and then proceed to vocational rehabilitation. Others will maintain employment and aim to make gains in reducing the impact substance use has on their employment performance. Yet others will work towards employment and substance use changes concurrently.

36.7.2.3 Rehabilitative Assessments and Vocational Objectives

Although assessment and intervention iteratively informing each other throughout treatment processes, assessment is the first stage of treatment and establishes the starting point for care planning in each life domain (bio–psycho–social–spiritual). The process of assessment encourages readiness for change, through increased understanding of the steps needed to meet their substance use, health and vocational goals. In this way, assessment can serve as an initial intervention. The outcomes of assessment can play a critical role in clinical and vocational outcomes as, for example the field of motivational interviewing considers the therapeutic relationship the single most important factor the counselor can affect.

Assessment begins once a therapeutic relationship has been established and the client is able and willing to engage in the assessment process. While a comprehensive description of assessment tools is beyond the scope of the current chapter, a range of such tools have been developed and undertaken. Nevertheless, the combined use of three assessment tools provides a foundation for vocational rehabilitation and care planning. These include a substance use assessment, a functionality assessment, and a readiness for change assessment.

Although not mutually exclusive from a substance use assessment, the functionality assessment is an important accompaniment where goals span beyond a simple change in substance use behavior to more generalized improved functioning. A functionality assessment may also critically inform vocational outcomes and labor market involvement goals. Such an assessment takes an inventory of individual health and service needs (access to which may affect or be affected by vocational activity) and assesses individual living and vocational skills (e.g., reading, writing, relating to supervisors and coworkers, or using a computer). Five key areas for a functional assessment include living, managing finances, learning, working, and interacting socially (US Department of Health and Human Services 2001). Skills assessments involve itemizing the cognitive, emotional, and physical components of a given skill vis-à-vis a functional activity and observing the client perform these skills in as close to a "real life" scenario as is possible. Strengths identified in the functional assessment can be then mobilized and deficits or limitations addressed through skill development. Another method for assessing function is through standardized vocational tests or through completing a vocational history.

Finally, and probably most importantly, is the need to assess the client's readiness for change, including motivation, self-efficacy, and strengths. The readiness assessment examines the complex social, emotional, physiological, and environmental factors contributing to the individual's vocational potential. As individual's strengths, weaknesses, barriers, and interests are discussed, clients are offered options for activities that would likely improve or develop their knowledge or awareness. The Decisional Balance Tool described above is an excellent assessment tool for establishing the client's readiness for vocational change and effectively develop awareness about the connection between substance use and individual function. At this stage it is necessary to consider whether education, skills development, or training is necessary, in order to meet vocational objectives. It is also necessary to assess whether individuals have requisite components to undertake activities designed to improve functionality, such as a stable home or stable finances. Notably, motivation for change has been documented as one of the most robust predictors of treatment success (McKay and Weiss 2001).

36.7.3 Structuring the Recovery Process

The concept of transitions or stages can be a helpful framework for structuring rehabilitation. The most widely accepted framework is associated with the transtheoretical model of change (Prochaska and DiClemente 1982, 1983). The shape of the recovery process will inevitably be different for each individual, with quite different activities depending on the stage at which a person enters rehabilitation. As mentioned above, the stages of change often follow precontemplation, contemplation, preparation, active, or maintenance phases. A clinician's role will be to enable them to identify their stage and create a plan accordingly. While described in further detail elsewhere (Prochaska and DiClemente 1982, 1983), each of these stages are briefly described in relation to return to work or maintaining work here.

36.7.3.1 Pre-contemplation

This stage is often described as the first stage of change. If the client is described as precontemplative, they do not perceive of their primary issues, including vocational considerations as related to substance use and are resistant or unaware of the possible correlation between their substance use and their functional deficits. At this stage, the clinician emphasizes exploring positive health changes in the areas where the client identifies needing help. For example, in instances where a person is seeking help finding employment, but does not associate substance use issues as a barrier to employment, the clinician can focus their time looking at the typical lifestyle necessary to be successful in employment. This exploration is done in a non-threatening way in order to build rapport. This allows an open discussion whereby the client is not defensive or oppositional to exploring their options.

36.7.3.2 Contemplation

As the client starts to explore their vocational functioning and its relationship to their substance use, they are described as being in the contemplation phase. They are contemplating the functional impact of change, usually through dialog and homework that is exploratory in nature. The direction of vocational rehabilitation will largely depend on the client's motivation for change. An individualized assessment enables the client to develop awareness about the complexity of factors that are contributing to their functional deficits.

36.7.3.3 Preparation

As the client explores and contemplates change, they may consider action in one or more areas of their life. This action may include more intensive change, such as residential treatment, or slow progressive change as in outpatient or community based counseling. Typically, priorities are set in any of the micro-, meso-, macro-levels or through biological, psychological, social, or spiritual lenses. The clinician offers exploration of the various settings possible for enacting change.

36.7.3.4 Action

If the client wishes to pursue change, they are said to be in the action phase of change, with goals set in the short and long term. The clinician works with the client to try change in any areas of functioning and then together, the clinician and client explore the functional effects of change.

36.7.3.5 Maintenance

Positive change that often needs maintenance to keep. Similarly, progress and goal attainment usually involves the person moving from an environment of high support and structure to reduced external supports. The maintenance stage acknowledges the undulating nature of substance use and enables the client to get increased support when needed despite having already achieved outcomes.

Individual vocational goals, and barriers to achieving them will provide key insight into the most appropriate approach to rehabilitation. These barriers may also help determine the most appropriate form of addiction treatment. Ideally, vocational rehabilitation would start the moment the person were able to engage in the process. The concepts of early recovery, middle recovery, late recovery and maintenance are described in the previously mentioned *Substance Use Disorders and Vocational Rehabilitation—VR Counselor's Desk Reference* (Glenn et al. n.d.).

36.7.4 The Role of Self-Help, Mutual Aid, and Peer Support

Individual's relationships with their peers may prove particularly important in the vocational process. Hope has been documented as an essential element of change, which has been operationalized as a way to link the past, the present, and future (Whitley 2010). Peer support provides clients with tangible examples of people similar to them at different stages of recovery that may foster the development of hope. Alcoholics Anonymous, Narcotics Anonymous, and various related 12-step programs are the most commonly recognized programs based on self-help or peer support models. Peer Support has the recognized benefits of providing a new support system, does not necessarily come with the institutional barriers of a client–therapist relationship, and is often a positive entry point. However, there is considerable debate about the effectiveness of AA/NA, and little evidence supporting peer support as a replacement for engagement with a health care professional (Arkowitz and Lillienfeld 2011; Kaskutas 2009; Kelly et al. 2009). When advising clients regarding self-help, the central question to ask is whether they feel that the service provides hope and whether they can develop the foundation of a new community. A potential area of peer-based support that has not been systematically explored is employment-focused peer support for individuals with substance use disorders.

36.7.5 Developing Readiness to Change From a Vocational Perspective

To develop awareness about substance use behavior and employment goals, there are a number of helpful approaches. These may include exploring the job market, the skills and experience levels necessary to acquire and retain a particular job, the types of stressors associated with different jobs or types of work, and their understanding of vocational expectations and employee practices. Prevocational services such as these are typically explored before an individual begins the job-seeking process. Although some clients have work-related skills that might be recovered, updated, or refined through a training process, others may have limited employment skills and may need to develop them. Supportive activities in this regard could further include exploring job postings or visiting work sites. The objective of this pre-vocational activity is to facilitate client learning and to develop a realistic view of their skills, abilities, and limitations. The client, in the process, will learn problem solving and coping skills, which may further enhance their motivation and self-efficacy related to vocational-specific change.

Although sometimes perceived as slow paced, the rehabilitation process is itself therapeutic and often promotes life changes that provide long term benefits. Throughout this process, specific skills may be taught and reinforced to support acquiring competitive employment. These may include competency with computers, resume writing and skills considered important in employment environments, including interpersonal communication, punctuality, and accountability. Because individuals will, as a part of their employment, receive compensation, they may also need to acquire or enhance their ability to manage money.

It may also be beneficial at the pre-employment stage to encourage clients to undertake home or community work, where appropriate. Since vocational involvement and labor market participation will occur in the real community, an exploration of and engagement with the community becomes essential to preparing for a return to work. This engagement could entail visiting community resources such as libraries, stores, and businesses with purpose of observing and taking note of how these institutions employ individuals. Volunteering and taking continuing education courses to determine and validate interests can also be helpful.

36.8 Employment Models: Returning to Work and Staying at Work

A range of employment types and work-specific engagement and support models to assist individuals who have substance use disorders. Many of which fall under workplace policies or social support mechanisms. For example, during or following engagement in addiction treatment or vocational rehabilitation, individuals may seek competitive employment. Individuals who are in existing employment may take a leave of absence or access workplace specific supports for substance use disorders. They may also seek employment counseling as a part of conventional treatment programs, though this is not often documented and rarely evaluated (Magura and Staines 2004). Despite evidence of its cost-effectiveness (Shepard and Reif 2004) and repeated calls for the expansion, VR counseling has been inadequately provided (West 2008). A comprehensive review of the different types of vocational support programs in an addiction treatment context is beyond the scope of the current chapter (refer to Magura et al. 2004 for a review). However, a number of employment interventions warrant further attention.

Employment interventions are highly particularized, with different target populations, eligibility criteria, durations, design, and desired outcomes. As a result, it is very difficult to develop guidelines surrounding best practices, evidence around effectiveness, or templates for future interventions. Four main types of interventions offered in conjunction with addiction treatment that may exist independently or in combination with one another. These include: (1) work readiness training, similar to the prevocational approaches described above, (2) skills training, (3) job placement assistance, or (4) supportive employment (Magura et al. 2004).

Supportive Employment appears to have developed an evidence base for the attainment of vocational goals (see Substance Abuse and Mental Health Services Administration 2009). Supported Employment is a VR approach focusing on helping people with addictions and mental health issues to choose, get, and keep competitive employment, with additional supports to promote success in the workplace. The main principle these models are the belief that all people are capable of working in the competitive labor market. Rather than focus on prevocational assessment and training, consumers are offered help finding and keeping jobs that capitalize on their existing strengths. The primary goal of supportive employment is not to require change, but match client's experience and job preferences with existing jobs. Emphasis is on rapid job search at the outset, and with success clients' enhance their self-perception as workers and contributors, which in turn may contribute to their willingness and ability to pursue other rehabilitative goals.

36.8.1 Alternative Income Source Development

Employment models may also be fruitful in encouraging labor market participation for individuals who engage in income generation practices that may expose them to considerable risk to health and safety. These include, for example, sex work or illegal income generation such as drug dealing or acquisitive criminal activity (DeBeck et al. 2007) that in the presence of viable economic alternatives, they would otherwise forgo. While examples of the development of economic alternatives are rare, they have been shown to decrease high-risk behavior among drug using sex workers (Sherman et al. 2006). Involvement of drug users in the delivery of health programs or research has also been well received by participants (Hayashi et al. 2012; Kerr et al. 2006; Latkin et al. 2003), although these initiatives' impacts on health, social, and economic outcomes have not been evaluated. These types of initiatives do, nevertheless, hold the potential to facilitate subsequent labor market involvement because of the skill development, acquisition of prosocial roles or enhancement of beliefs about employability inherent licit income generation (Richardson et al. 2012a).

36.8.2 Contingency Management

Another potentially applicable employment model for individuals who are out of treatment is vocational contingency management (CM). This model reinforces drug abstinence for individuals by linking individuals' access to employment and their wages to biologically verified drug abstinence, generally through a requirement to provide drug-free urine screens (see Silverman et al. 2007 for a review). Generally, individuals who are either stabilized on methadone maintenance or have completed drug treatment are provided access to a job in a specialized workplace. If they provide a drug-free urine screen, then they have regular access to the workplace at a preestablished wage. If they do not, they may either be denied access, or face a significantly decreased wage that they then gradually rebuild to previous levels through the subsequent provision of repeated drug-free screens. Various configurations of financial incentives and sanctions are possible through CM models. This type of financial reinforcement has been shown both to encourage labor market participation and abstinence from drug use (DeFulio et al. 2009). This intervention has, to date, not been evaluated for other outcomes, such as decreased frequency or intensity of drug use as opposed to abstinence, changes in socioeconomic status or vulnerability, accessing other health or social services, or other health-related or prosocial behavioral outcomes.

Additionally, the effects of CM interventions do not reliably produce change in drug-use behavior beyond the duration of the intervention, and individuals tend to relapse once financial incentives are removed (Silverman et al. 2007). While the broader scale up of CM strategies may be related to issues of financial feasibility, a lack of attention to underlying issues, potentially negative side effects and philosophical objections (Kirby et al. 2006), this type of model may warrant further exploration in the promotion or maintenance of labor market engagement.

36.9 Summary and Best Practice Points

1. Employment is an important social determinant of individual mental and physical health among individuals who use psychoactive substances problematically.
2. Substance use occurs among all demographic groups across the socioeconomic spectrum, and the impact of substance use on labor market outcomes depends on micro-, meso-, and macro-level factors.
3. Rehabilitation considerations in returning to work or staying at work for individuals with substance use disorders are highly context- and individual-specific.
4. Vocational rehabilitation clinicians should consider and enable their clients to become aware of the functional relationship between their substance use and employment performance. Clients and counselors need to explore the cultural, sociopolitical, physical, economic, psychological, and spiritual circumstances of each client.
5. "Recovery" may involve cessation of substance use, but it may not. Clinicians can support their clients through an understanding of the unique stages of recovery and by matching interventions accordingly. Vocational considerations of returning to work and staying at work should be present throughout the therapeutic process.
6. Working with clients to identify and plan accordingly for relapse triggers, and to develop skills necessary to problem solve and cope with them, is a crucial component of long term substance use disorder management and vocational rehabilitation.
7. The establishment of client-centered vocational goals should consider the client's motivation and self-efficacy within their given environment, which includes employment readiness and the economic and social conditions of their surroundings.
8. To support individual vocational objectives, clinicians may also need to explore the specific skills and environments associated with the client's goal, including the types of stressors and rewards associated with particular roles and contexts.
9. An important aspect of vocational rehabilitation among substance using individuals is enabling the client to develop a realistic view of both their skills, abilities and limitations in addition to the requirements of employment.
10. Several models have been developed to specifically facilitate the return to work or job retention component of a broader rehabilitation program among substance users. These include, but are not limited to, conventional job search, supportive employment, alternative income development and contingency management approaches. No single model is or will be appropriate for all clients.

36.10 Conclusion

In sum, the relationship between substance use and employment is a complex one. Employment, as an important social determinant of health in the general population, is often neglected as an important component in the treatment and rehabilitation process among people who use drugs. In the academic literature, the relationship between drug use and labor market outcomes is consistently hypothesized as an inverse one. The reality is that most people who use drugs are also employed. However, for a substantial minority of drug users, complex configurations of micro-, meso-, and macro-level factors create considerable pressures away from labor market participation, although the contribution of factors at each of these levels may be positive or negative, and is generally context-specific. Further, from a vocational rehabilitation perspective, linkages between addiction treatment and vocational services are generally insufficient, despite evidence of their cost-effectiveness.

Occupational perspectives on vocational rehabilitation and labor market participation among individuals with substance use disorders helpfully and constructively acknowledge that individual change occurs across a number of domains, of which vocational involvement is an important one. The overarching goal of these approaches is improved functionality, which may take various forms. Occupational perspectives also recognize that rehabilitative change can occur in contexts of active substance use as well as abstinence. While perspectives and approaches to returning at work and staying at work are, in general, underdeveloped, it is important to recognize that, as in the general population, employment and labor market involvement are important social determinants of health among people who use drugs in problematic ways.

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Part V

Research, Policy, and Practice Directions

37

Where Do We Go From Here in Return to Work Research, Policy, and Practice: A Postscriptum

Izabela Z. Schultz and Robert J. Gatchel

The traditional Cartesian mind–body approach to understanding work disability and return to work (RTW) processes and outcomes has failed from clinical, occupational, legal, societal, and economic perspectives (e.g., Schultz et al. 2000, 2007). In the last 20 years of research advancement, a paradigm shift in RTW research and evidence-informed practice has occurred. Unidisciplinary research approaches, either biomedical or purely psychosocial in focus, have gradually given way to multidisciplinary and transdisciplinary biopsychosocial models of RTW and stay at work (SAW). Inspired by Bronfenbrenner's ecological systems theory (Bronfenbrenner 1979), and his nested conceptualization of systems as involving the interacting contexts of *micro-system* (individual variables), *meso-system* (organizational factors and interactions among micro-systems), *macro-system* (societal, policy, legislation, and cultural factors), and *chrono-system* (patterning of events over time), the individual-oriented research has become complemented by system-focused research. Aided by the increasingly popular International Classification of Functioning, Disability, and Health (ICF) model of the World Health Organization (WHO 2001; Escorpizo et al.), which emphasizes the dynamic interaction between an individual and a system, RTW research has further evolved into exploring and investigating these interactions and their various characteristics.

With the increased volume and improved design quality of research, as well as through meta-analyses, systematic reviews, and even systematic reviews of systematic reviews, albeit primarily in the musculoskeletal disorders area, the multisystem approach to RTW now constitutes the prolific research scene and leads to an improved understanding of the RTW processes, outcomes, and predictors. This expanding research resulted in the development of various clinical guidelines for the management of musculoskeletal disorders and a pioneering set of integrated clinical and occupational guidelines (Waddell and Burton 2001). Studies of RTW in mental disorders, cancer, and neuromuscular disorders subsequently followed. Likewise, considerable

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advances have been made in conceptualization and operationalization of RTW/SAW outcome measurement, identification of RTW predictors, construction of multivariate disability predictive models, and design of early interventions to prevent work disability.

The chapter contributors to this *Handbook of Return of Work*: *From Research to Practice* critically evaluated and synthesized the evolving concepts, methods, and expanding quantitative and qualitative evidence in the field, from both cross-diagnostic and diagnosis-specific perspectives. An improved understanding of the determinants and interactive processes involved in the RTW/SAW has resulted in the inclusion of risk and protective factors in the RTW/SAW in clinical research, program design and in the implementation of occupational interventions at micro-system, meso-system, macro-system, and chrono-system levels. These advances have been paving the way to improved short term and long term clinical and occupational outcomes. The following themes and conclusions regarding RTW/SAW emerged in this Handbook:

- Strong research evidence exists that work is beneficial for health, and this positive effect offsets the risks of work and the negative effects of unemployment (Aylward 2015; Black 2008; Waddell and Aylward 2010; Waddell and Burton 2006). Notably, the work as therapy concept was originally introduced in Loisel's model of integrated clinical and occupational rehabilitation (Loisel et al. 2001). However, despite its effectiveness, it has not been adequately translated into practical system-based approaches, policies, and programs.
- The RTW/SAW processes are clearly best understood from a biopsychosocial perspective, and the existing accumulated research evidence supports this conclusion (e.g., Aylward 2015; Schultz and Knauf 2015). The construct and definition of "psychosocial" component of this model evolved from solely individual-oriented characteristics to psychosocial dimensions of the workplace environment and interactions among stakeholders of the RTW/SAW.
- Specifically, the International Classification of Functioning, Disability, and Health Model (ICF), and the emphasis on the dynamic interaction among the individual returning to work and the multisystems and multiple stakeholders involved in the RTW process, shows the greatest promise for future research, policy decisions, and practice (Aylward 2015; Escorpizo et al. 2015; Main and Shaw 2015; Shaw 2015).
- Working collaboratively with the RTW stakeholders, including the worker and his/her employer, as well as health care, rehabilitation, and compensation systems, are essential components in RTW practice and also in RTW research (Shaw 2015; Main and Shaw 2015; White et al. 2015). Strong evidence exists supporting the effectiveness of RTW and disability management programs, especially related to multicomponent programming and stakeholder involvement (Brewer et al. 2007).
- An improved understanding of organizational, policy, and micro-system interaction factors, together with work characteristics, complements research on individual worker's sociodemographic, psychosocial, and clinical characteristics, and likely leads to improved effectiveness and efficacy of RTW/SAW interventions (Main and Shaw 2015; Parent et al. 2015). A comprehensive RTW context analysis identifies barriers and facilitators to RTW/SAW, and is expected to link them to interventions as the first stage of planning. However, a paucity of literature exists in this regard (Baker et al. 2010; Fassier 2015).
- A clear research consensus documents psychosocial factors, both individual and system-focused, as better predictors of RTW/SAW outcomes when compared to medical or biomechanical factors (Aylward 2015; Main and Shaw 2015).
- A more balanced approach in RTW motivation research as it relates to individual psychosocial factors is recommended; this includes documenting the economy of secondary gains and losses (Choi et al. 2015). Importantly, a

strong emphasis on cognition-related factors associated with individual beliefs, perceptions, expectations and ways of coping in the RTW context and on psychosocial factors associated with readiness for change and RTW has emerged (Jensen 2015; Main and Shaw 2015; Sullivan 2015).

- Separation of employee-focused research and workplace-focused research has been detrimental to empirical research and model development in RTW/SAW; this chasm needs to be replaced by an integration of both perspectives into a new paradigm (Main and Shaw 2015).
- Homogenizing RTW interventions, which are multidimensional and multifaceted in nature, under a single heading likely hampers progress in the field. RTW interventions are highly diverse, and are comprised of mental health, physical activation, social support, work accommodations, supervisory factors, job demand, job control, workplace policy, and wellness interventions. Each of these interventions has different evidentiary support and contextual applications (White et al. 2015). They need to be separately considered. In addition, integrative approaches, especially those combining clinical and occupational interventions, are likely to be the most promising; however, they are still relatively understudied, despite pioneering work by Loisel et al. (2001).
- Among individual and systemic factors predictive of RTW/SAW, some are modifiable (e.g., workplace organization, employer and coworker support, job demands, expectations of RTW, fear of RTW, catastrophizing) and some are not (e.g., legislation, culture, disability benefit/compensation structure, and worker sociodemographic characteristics or personality). Likely the best occupational outcomes are achieved by targeting modifiable risk factors that are unique in the worker's individual circumstances or a group of workers sharing certain functional and contextual similarities, such as diagnosis, personal resources, limitations, stage after illness or injury, work demands and availability of supports. Notably, predictive formulae of the highest ecological validity for RTW outcomes have been developed for musculoskeletal disorders (Gross and Bostick 2015). Importantly, in this process, methods for identification of subgroups of injured workers of differing risk for RTW failure profiles have been advanced, especially in musculoskeletal disorders (Pransky et al. 2010; Schultz et al. 2015). This leads to development of integrative RTW intervention models designed specifically for high risk injured workers (e.g., Schultz and Chlebak 2014; Schultz et al. 2008).
- Mounting evidence related to the role of organizational and social factors, including social relationships and interactions with coworkers and supervisors and the role they play in the RTW/SAW process, calls for practical implementation solutions in the workplace with respect to RTW interventions (Kwan and Schultz 2015; Tjulin and MacEachen 2015).
- Although emerging research is found on the impact of the disability benefit structure and policy on RTW outcomes, these findings tend to be region- or country-specific that resist broad generalizations. Nevertheless, systematic research on economic cost-benefits is important to provide valid RTW business case analyses to policy developers and decision makers (Tompa et al. 2015). Economic analysis of RTW outcomes could be routinely incorporated into outcome sets already widely used in RTW studies.
- Engagement at work and social context of work environment are both postulated as critically important in understanding the complexity of RTW processes and interventions (Main and Shaw 2015); however, they are not fully recognized in the large RTW body of research and linked to design and implementation of real-life RTW interventions.
- Cognitive-behavioral approaches to the individual-focused aspects of RTW interventions have the best evidentiary support in the RTW/SAW field. They are not confined to psychosocial clinically oriented treatment and can be successfully applied in other multidisciplinary interventions (Hanson et al. 2006;

Sullivan 2015). Motivational interviewing has emerged as an important individual method of effecting change and readiness for RTW (Jensen 2015; Richardson and Epp 2015).

- Timing of intervention and focus on removal of individual obstacles to RTW are likely important, but have not been sufficiently studied to provide the clinicians and RTW professionals with appropriate evidence and guidance in this regard.
- Occupational outcome evaluation and associated outcome prediction research and practice in RTW has moved beyond simple binary RTW outcomes and absence duration to the measurement of work productivity. New instruments have been developed and are ready for further validation studies and implementation (Brede et al. 2015; Main and Shaw 2015). In addition, a multiyear, long term versus a short term perspective on RTW outcome measurement is essential in future research and implementation efforts. Recurrence of work absence over time requires monitoring as it likely represents RTW/SAW failure (Pransky and Shaw 2007).
- Aging workers and others with mild cognitive impairments constitute one of the growing current and future challenges for work participation, accommodation and retention (Ettenhofer et al. 2015). Related neuroscience and clinical neuropsychology advances require translation into more occupational research and solutions.
- Cross-diagnostic common factors in RTW/SAW interventions are emerging but still require further validation research. Improved understanding of diagnosis-specific dimensions of the RTW process is equally important. For example, what works for people with chronic musculoskeletal pain, depression, and anxiety, namely graduated RTW (e.g., Main et al. 2015; Peer and Tenhula 2015), does not necessarily work for persons with serious mental illness, and this population benefits most from immediate work placement with supports (Krupa 2015). Likewise, accounting for the broader context of RTW intervention is important. Research indicates that injured workers in receipt of compensation benefits differ widely with respect to their risk for disability level; only those at high risk for disability (in contrast to those at low to medium risk level) are apt to benefit from multidisciplinary, multi-stakeholder early interventions in the workers' compensation context (Schultz et al. 2008; Schultz et al. 2013).
- Research in the RTW/SAW field is evolving from tertiary prevention (targeting injured, disabled or ill employees) through secondary prevention (targeting those at risk of work disability) to primary prevention, via organizational health, wellness and attendance policies and practices, workplace sociocultural climate shift, workplace human resource strategy and universal design.

Notably, limited research and practical examples show a direct link between empirically derived individual and system-based risk for work disability models and early disability prevention interventions that target modifiable factors and barriers to RTW (Schultz 2009; Schultz et al. 2008, 2013, 2015). More research on this often "missing link" is required in order to avoid expending limited resources on "one size fits all" interventions instead of focusing on risk-targeted prevention of needless disability.

Some Handbook chapter contributors emphasized the gap between a body of existing research and accumulated evidence that could inform policy and practice and actual implementation of findings. Various macro-system factors have been hypothesized to obstruct implementation: legislation, policy, societal and cultural attitudes, conflicting interests of stakeholders, prevalent models of health service delivery, disability compensation, employment and human resource management, availability of resources, the economy and various regional, as well as national or even international sociopolitical factors. These factors are often considered as "background" or "noise" variables in research. However, due to their measurement difficulties, their true, rather than speculated, importance in RTW predictions and outcomes remains unknown. Moreover, there is virtually no research on the cultural aspects of

RTW and multisystem interactions, likely due to construct validity, measurement and methodological challenges. Importantly, most research data on RTW interventions, predictors, and outcomes have been diagnosis-specific; this limits generalizability of the findings to other conditions.

Only in recent years, with the proliferation of studies beyond the well-researched field of musculoskeletal disorders, has research into mental health, neurological disorders, cancer and chronic illness (that the attempts to develop cross-diagnostic syntheses of RTW-related evidence) been advanced. Future research challenges will incorporate identification of common RTW intervention factors, contextualized by time and place variables, and systemic considerations versus unique diagnosis-specific issues. The current knowledge base is not ready for this complex task, although the accumulation of systematic reviews pertinent to the RTW field has helped initiate these efforts. Notably, RTW knowledge and skill base are still emerging in many clinical conditions, despite high prevalence rates. For example, such conditions include addictions, autism spectrum disorders, and cardiovascular conditions. These diagnostic domains require extensive research before the evidentiary support for occupational rehabilitation and RTW intervention is advanced enough to help practice.

In addition to future research directions, the body of RTW/SAW knowledge accumulated this Handbook also facilitates the development and provision of future health, disability, occupational and human resources policies, and best practices. These postulated practical recommendations are highlighted below:

- The worker does not have to be fully recovered and symptom-free in order to initiate RTW planning because RTW intervention can become a form of therapy and rehabilitation for the worker. Thus, clinical and occupational rehabilitation can and perhaps should overlap and interact, leading to RTW. However, the worker needs to be psychologically ready for RTW and might require appropriate therapeutic interventions to help develop such readiness. Motivational interviewing and cognitive-behavioral therapy with psychoeducation, reassurance, management of RTW expectations and sense of uncertainty, together with coping and self-management skills training, constitute examples of such interventions.
- Employers interested in positive RTW/SAW outcomes need to develop a people-oriented culture in the work environment, supported by appropriate health, wellness, human resource, attendance management, management, and RTW policies and practices. Having a designated staff member as a RTW/SAW coordinator is likely to facilitate positive occupational outcomes. In addition, universal-design approaches to the workplace environment might minimize the need for individual physical accommodations (Sanford 2015).
- RTW/SAW stakeholders: employers, healthcare and compensation/insurance representatives, would likely achieve improved RTW outcomes by forging collaborative RTW teams, especially for workers at risk for RTW failure and for other complex clinical and occupational scenarios. Active participation of injured or disabled workers is essential.
- Interventions should be tailored to overcome identified RTW barriers, while capitalizing on existing resources and understanding key contextual factors involved. More research in this emerging area is needed to assist practice (Baker et al. 2010; Fassier 2015).
- The RTW policies and practices should encompass provisions for assessment of functional capacity and limitations (physical, cognitive, emotional, and behavioral); identification of multilevel barriers and facilitators of RTW; team-based RTW planning with an active participation of the employee, key stakeholder representatives and a coordinator; and the determination of optimal RTW approaches for a given case scenario, including appropriate work accommodations and other workplace supports. The supportive role of supervisors and coworkers should also be delineated. The RTW process needs to be monitored, and its occupational, health, and

economic outcomes routinely measured, both from short term and long term perspectives.

- Workplace-based RTW programs need to make provisions for being multidisciplinary and multimodal, yet individualized in order to target modifiable risk for disability factors. An integrated clinical and occupational intervention model that considers individual and employment-based psychosocial factors, in addition to physical and functional limitations, has been proven to be effective (e.g., Loisel et al. 2001). Timing, location, and components of intervention need to be carefully selected and systemic supports ensured.
- When implementing workplace interventions, such as work accommodations, social dimensions of this process need to be recognized. Especially, establishing trust between the employee and the participating stakeholder, and balancing it with perceived control over the process is recommended (Kwan and Schultz 2015). Managing injured workers' expectations of recovery and return to work and decreasing their uncertainty associated with the RTW process and outcomes constitutes a promising path (Stewart et al. 2012) towards improved RTW/SAW results. Workplace and disability/sickness compensation policies and programs have a direct impact on these important psychosocial factors and can be developed.
- Increasing workplace supports and employee autonomy, discretion, and participation, adjusting physical and psychosocial demands during the RTW process, and creating a *margin of maneuver*, are likely to be a practical generic model of achieving positive RTW outcomes (Durand et al. 2015), especially in the context of accommodations, including ergonomics (Paquette 2015).
- Psychosocial capacity evaluation approaches need to be developed and validated, akin to physical capacity assessments, in order to assist with RTW planning. No commonly accepted, well-standardized and validated approaches to such evaluations now exist, except for emerging guidelines for fitness for duty examinations that are occupation-specific (e.g., for physicians, firefighters, police officers).
- Knowledge mobilization efforts in the development of evidence-informed, "hands on," best RTW practice books or educational online resources, such as e-health, social networks, and smart phone applications for the workers (de Boer et al. 2015), and cross-diagnostic integrated clinical and occupational guidelines for the RTW stakeholders, including clinicians, employers, and the insurance/compensation system, which are regularly updated, will also greatly advance the field. However, the utilization of any clinical and occupational guidelines with persons from minority cultural groups requires caution due to paucity of research evidence on cultural factors in rehabilitation, treatment, and return to work (Schultz et al. 2015). Flexibility and customization of RTW programs is important. Flexible and context-specific approaches may be more effective than fixed, protocol driven approaches as shown in the early intervention study with compensated back injured workers by Schultz et al. (2013).

The research evidence to date, especially in the area of musculoskeletal disorders and other highly prevalent conditions, has been maturing at a fairly rapid rate. It is now at the stage whereby large healthcare, insurance, compensation and disability management systems could benefit from the: development and implementation of statistical algorithms to predict those at an elevated risk for disability; determination of what the modifiable RTW factors are and what components of RTW intervention can be applied; and the best intervention timing to produce enhanced RTW/SAW outcomes. This action would require increased attention to psychosocial and occupational factors, rather than ongoing application of the less effective biomedical and forensic models that are still, unfortunately, the models of choice for many compensation systems (Schultz et al. 2007).

37.1 Conclusions

In order to bridge the chasm between RTW research and practice, the traditional boundaries among "individual-oriented" sciences and professions, and those involving socially constructed meso- and macro-system entities (such as laws, regulations, policies, institutions, and organizations) must continue to dissipate. Organizational, industrial, and rehabilitation psychology has begun to join forces with rehabilitation and occupational medicine, occupational sciences, and vocational rehabilitation, as well as with the social sciences, health economics and human factors architecture. Transdisciplinarity in advancing biopsychosocial model is ultimately the best approach of choice in producing the synergy for addressing RTW/SAW challenges.

The key challenges for the next decades include the following: the development of integrated approaches to RTW/SAW that combine primary prevention at the macro- and meso-system level; identification of risk and protective factors for given occupational outcomes; and the linking modifiable factors to the design of multifaceted RTW barrier-targeting interventions. Various combinations of complex and often dynamically changing psychosocial, clinical, functional, time-based occupational, job-related, and other factors (many of them already discovered, but some still waiting to be identified) are apt to be important considerations in selecting the *right* intervention for the *right* individual, at the *right* time, in the *right* environment and for the *right* outcome. These complex outcome predictive formulae and their links to the composition and design of effective RTW/SAW interventions are emerging in the area of musculoskeletal disorders. However, again, they are not ready for other clinical and diagnostic applications.

Of concern, because the field is dominated by the musculoskeletal research evidence, despite accelerated research progress in mental health, cancer and other highly prevalent conditions (in the absence of sufficient data on other diagnostic conditions), caution needs to be exercised when developing interventions for diagnoses not covered in primary studies, upon which the design of intervention is based. The "Intervene and Hope that it Works" approach ought to be avoided. Rather, the selection of the RTW approach and components need to be based on the specific criteria, including the best fitting conceptual intervention model in a given context and the applicability of research evidence to date. Likewise, although much has been accomplished to determine various essential components of RTW/SAW interventions, their multifaceted, customized, contextualized, and difficult-to-standardize and -replicate nature, still make the field open to more conceptual and methodological innovations and integrative efforts. Moreover, an insufficient volume of randomized studies, a paucity of mixed-method studies, inadequate methodology to capture macro-system and interactive factors, a wide diversity of outcome measures, as well as existing generalization challenges, require future development.

Last but not least, implementation challenges of existing RTW/SAW evidence in the real world, where non-quite-modifiable political, social, cultural, attitudinal, power structure, professional interest, and economic factors might prevail over scientific argument, will continue to exist. The researchers and innovators in the field will need to find new ways of engaging, communicating, working together, and mobilizing knowledge at the macro-system level, including policy stakeholders and decision makers, and society at large.

Understanding factors involved in resisting change and promoting innovation and behavioral and attitudinal change are important. (Aylward 2015; Fassier 2015). Also, more research is required on appropriate implementation conditions for RTW interventions and their sustainability over time (Roquelaure 2008). The accumulated impressive RTW/SAW body of evidence now requires concerted multilevel social marketing and public education efforts, which, fortunately, have already been initiated in several countries and jurisdictions, especially in Australia (e.g., Pransky et al. 2010), with encouraging results.

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Index

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