

# Chapter 14

## Behavioral Health and Cancer



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### Introduction

Integrated care aims to connect the primary healthcare system with other human service systems in order to improve patient outcomes (Leutz, 1999). Behavioral medicine is an important addition as it integrates psychological, behavioral, and social factors into the prevention, treatment, and rehabilitation of illness and disease (Emmons, 2012; Keefe, 2011; Ruddy, Borresen, & Myerholtz, 2013; Valentijn, Schepman, Opheij, & Bruijnzeels, 2013). These efforts are important for cancer, as it is a disease having modifiable behavioral factors capable of reducing risk, morbidity, and premature cancer death.

We discuss contributions in the behavioral aspects of primary, secondary, and tertiary cancer prevention. For primary prevention, the focus is on modifiable behaviors for reducing exposure to cancer-causing substances, practices, and environments. For secondary prevention, behavioral aspects of usage and adherence to screening for breast, cervix, and colon cancers are discussed. As there is a large tertiary prevention literature, we focus on the detection and treatment of stress, anxiety, and depressive symptoms to reduce morbidity and mortality. We organize the three sections by the inclusion of (1) nature of the problem, (2) characteristics of individuals at risk, (3) barriers to prevention, and (4) guidelines for prevention or treatment. Also provided are discussion of (5) behavioral care, with an emphasis on efforts/interventions used in primary care settings; (6) behavioral interventions of low, moderate, and high intensity; and (7) the efficacy/effectiveness of interventions with individuals at risk. To begin, the cancer problem—incidence and mortality for adult males and female—is overviewed and, to end, commentary on the role of behavioral science in oncology is provided.

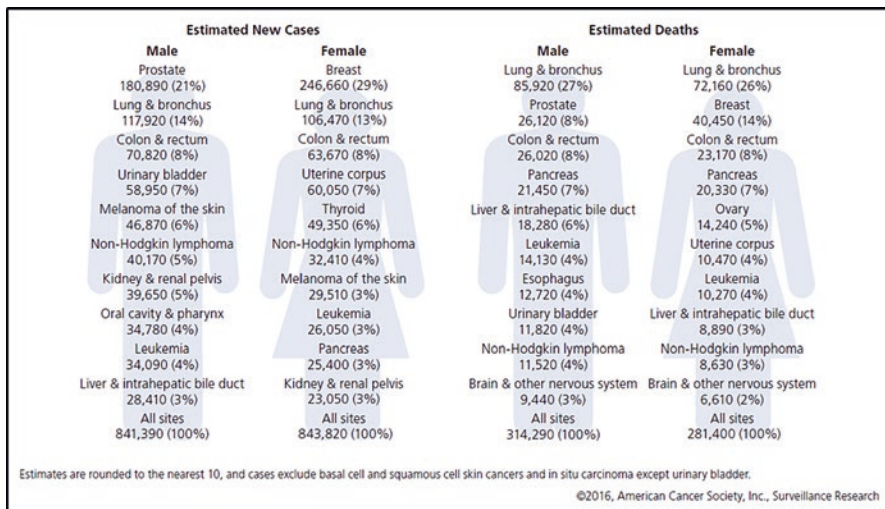
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## The Cancer Problem

The number of individuals affected by cancer continues to grow. In 2012 (the latest year for which information is available), it is estimated that 14.1 million new cancer cases occurred worldwide (Ferlay et al., 2015) with the burden expected to increase exponentially by 2030 due to increased population growth and longevity (Edwards et al., 2010).

In the U.S., roughly 1.7 million new cancer cases are diagnosed annually (American Cancer Society, 2016a). The most frequently diagnosed cancer sites are presented in Fig. 14.1. Survival rates are also increasing: the 5-year survival rate for all cancers diagnosed during 2005–2011 was 69%, up from 49% during 1975–1977 (American Cancer Society, 2016a). In 2016, more than 15.5 million children and adults with a history of cancer were alive (American Cancer Society, 2016c). By 2026, estimations suggest that the survivor population will increase to 20.3 million, with 10 million males and 10.3 million females. The majority of these individuals will be disease-free and return to primary care providers. Moreover, an oncologist shortage is predicted to occur by the year 2025 (Yang et al., 2014), further increasing the burden on primary care settings. Thus, improved survivorship will require an increased focus on integrated healthcare implemented for primary, secondary, and tertiary cancer prevention.



**Fig. 14.1** Cancer incidence and mortality by site and gender. (American Cancer Society, *Cancer Facts and Figures*, 2016a)

## Primary Prevention

Primary prevention is defined as altering behaviors or exposures that can lead to disease. While there are notable examples of genetic (e.g., BRCA1 in breast) and immune factors (e.g., non-Hodgkin's Lymphoma for those on immunosuppressive drugs, Kaposi's sarcoma for those with HIV immune suppression), the majority of cancers are not due to host factors. Environmental causes such as exposure to substances (asbestos, arsenic) or radiation are of low incidence as well. Instead, most cancers can be avoided through primary prevention (American Cancer Society, 2016b). Broadly, this consists of communications regarding cancer risk and promoting lifestyle interventions.

### *Cancer Risk Communication*

*Nature of the Problem* Health communication is the first step in prevention and has the greatest potential to reduce cancer burden at individual, institutional, and societal levels (Fischhoff, Bostrom, & Quadrell, 1993; Kreps, 2003). For patients to make informed decisions about cancer, they have to be aware of their risk. Cancer prevention efforts typically involve the development and distribution of persuasive and informative educational material and programs as well as the development and use of behavioral intervention programs to initiate, promote, or change target health behaviors (Buller et al., 1999; Marcus et al., 2001; Pierce, Macaskill, & Hill, 1990). The ultimate aim is to prevent cancer initiation and/or speed its earliest detection (Kreps, 2003).

When health communication “goes wrong,” it can impair both primary and secondary cancer prevention (Davis, Williams, Marin, Parker, & Glass, 2002) and may affect patient participation in cancer control programs (Michielutte, Alciati, & el Arculli, 1999). Participants in health communication focus groups frequently report awareness of cancer; however, their knowledge of cancer and cancer screening was often found to be limited, inaccurate, or confused (Davis, Arnold, Berkel, & Nandy, 1996; Davis et al., 2001; Davis, Holcombe, Berkel, Pramanik, & Divers, 1998; Lannin et al., 1998).

*Characteristics of Individuals at Risk* Patients' health literacy is increasingly recognized as a critical factor affecting patient-physician communication and health outcomes. Health literacy refers to individuals' capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions. Poor health literacy is common, especially among elderly patients. More than 33% of patients ages 65 and older have inadequate or marginal health literacy, as do up to 80% of patients in public hospital settings (Williams, Davis, Parker, & Weiss, 2002). Patients with poor health literacy report worse health status and have

less understanding about their medical conditions and treatment; they may have increased hospitalization rates (Williams, Davis, Parker, & Weiss, 2002).

*Barriers to Prevention* A 2008 systematic review of health professionals' perceptions of patient-provider communication identified barriers (Légaré, Ratté, Gravel, & Graham, 2008). In 22 of 38 included studies, professionals identified time constraints as a barrier to discussion and shared decision-making. That is, despite knowledge of good communication and shared decision-making principles, providers believed that there was insufficient time to put said principles into practice (Rogers, 1995). Indeed, there is a general consensus that the growing demands and expectations of informed health consumers and societies pressure limited resources, including human resources (Kim, Salomon, Weinstein, & Goldie, 2006). Thus, time was cited as a barrier across many different cultural and organizational contexts (Légaré et al., 2008). However, results from more than a hundred randomized trials of patient-provider communication and shared decision-making provide no robust evidence that more time is required for prevention efforts in clinical practice than is usual care (Légaré et al., 2012, 2014; Stacey et al., 2014).

Providers also believed that such discussions were not applicable to their practice population (Cabana et al., 1999), either based on the characteristics of the patient (identified in 18 of 38 studies) or based on the clinical situation (identified in 16 of 38 studies) (Légaré et al., 2008). These results suggest that health professionals might be screening a priori which patients will prefer or benefit from shared decision-making. This is of some concern because physicians may misjudge patients' desire or ability to be actively involved in decision-making (Bruera, Sweeney, Calder, Palmer, & Benisch-tolley, 2001; Bruera, Willey, Palmer, & Rosales, 2002). Surveys consistently indicate that patients want more engagement than providers offer (Alston et al., 2012). Ironically, those patient populations that stand to benefit most from engaging in shared decision-making (e.g., older people, immigrants, people with lower levels of education, numeracy, and/or health literacy) report less interest in shared decision-making (Kiesler & Auerbach, 2006).

Although training programs for health professionals have been developed to address these barriers, they vary widely in what they deliver and how to implement them. In addition, evidence of their effectiveness is sparse (Légaré, Politi, Desroches, Stacey, & Bekker, 2012). Therefore, some have suggested that future interventions will need to target the public and patients directly (so-called patient-mediated interventions) in order to foster active patient participation in decisions (Légaré et al., 2008).

*Behavioral Care: Options and Efficacy* Authors (Davis et al., 2002; Mayeaux Jr. et al., 1996; Schapira, Nattinger, & McAuliffe, 2006; Schwartz, Woloshin, & Welch, 1999) have developed specific recommendations for effective risk communication. These recommendations incorporate not only clinicians but also institutions and other communicators (i.e., media or public health agencies).

- Clinicians should:
  - Slow down and use “living room language” that patients can understand.
  - Limit information given to patients at each interaction.
  - Review basic concepts of probability and their application to medical studies with patients.
  - Provide information based on a health belief model, rather than numerical probabilities.
  - Give priority to patient action, motivation, and self-empowerment.
  - Confirm patient understanding prior to ending an encounter.
- Institutions should:
  - Develop office-based tools to make up-to-date estimates of disease risk and treatment benefit easily available during office visits.
- All communicators (i.e., media or public health agencies) should:
  - Present data to the public in a clear and objective manner.
  - Use graphic displays to enhance quantitative risk communication.

### *Lifestyle Interventions*

An estimated 75% of all cancers are due to modifiable, lifestyle risk factors: tobacco exposure, dietary intake (alcohol use, fat, low fruit and vegetable intake) and/or physical inactivity, sexual and reproductive lifestyle (unsafe sex, HPV exposure), and general environmental exposures (urban air pollution, household use of solid fuels) (Danaei, Vander Hoorn, Lopez, Murray, & Ezzati, 2005). Many of the targeted problems below are also ones related to the onset or worsening of other problems, such as cardiovascular disease, the leading cause of death and disability in the U.S. (Heron & Anderson, 2016).

### *Tobacco Use*

**Nature of the Problem** Roughly 188,800 of the estimated 595,690 cancer deaths in 2016—32%—will be caused by tobacco use (American Cancer Society, 2016a). In addition to lung cancer (Alberg & Samet, 2003; U.S. Department of Health and Human Services, 2014), tobacco exposure increases risk for oral, laryngeal, pharyngeal, esophageal, gastric, pancreatic, renal, liver, bladder, uterine, cervical, colorectal, and ovarian cancers (Botteri et al., 2008; Castellsagué & Muñoz, 2003; Engeland, Andersen, Haldorsen, & Tretli, 1996; Hellberg & Stendahl, 2005; Iodice, Gandini, Maisonneuve, & Lowenfels, 2008; Liang, Chen, & Giovannucci, 2009; Sasco, Secretan, & Straif, 2004; Siegel et al., 2015). For many of these cancers, the risk

conferred by tobacco exposure persists above and beyond other known risk factors (e.g., HPV exposure for cervical cancer). It should also be noted that tobacco users are less likely to engage in other health protective behaviors. For example, increased tobacco cravings are associated with low levels of physical activity (Haasova, Warren, Thompson, Ussher, & Taylor, 2016). Taken together, this may lead to an exponential increase in cancer risk. Thus, two of the most effective approaches to reduce cancer incidence are to reduce rates of tobacco use and exposure level through public health policy and behavioral interventions.

Comprehensive tobacco-control programs increase smoking cessation rates and also decrease initiation of smoking (*WHO report on the global tobacco epidemic*, 2013). In fact, public health policies, such as smoking bans and tax increases, have led to substantial decreases in the number of smokers over the last 50 years (U.S. Department of Health and Human Services, 2014). For example, youth (12–17 years) and adult (25 years and older) cigarette use declined dramatically with the start of anti-tobacco counter-marketing mass media campaigns (Farrelly, Davis, Haviland, Messeri, & Healton, 2005; Murphy-Hoefer, Hyland, & Rivard, 2010). Still, there is room for improvement with vigorous continuation of health policies: an estimated 30% reduction in the number of smokers could be achieved by doubling the inflation-adjusted price of cigarettes (Jha & Peto, 2015).

This potential for future gains occurs, however, when the technology of tobacco use itself is changing. Electronic cigarettes (or e-cigarettes) have been promoted as being more cost-effective, amenable to use in smoking-restricted environments, and socially acceptable than traditional cigarettes (Cobb, Byron, Abrams, & Shields, 2010; Henningfield & Zaatari, 2010; King, Alam, Promoff, Arrazola, & Sube, 2013). Between 2010 and 2013, the use of electronic cigarettes increased significantly across all demographic groups, although the use is highest among young adults ages 18–24 (McMillen, Gottlieb, Shaefer, Winickoff, & Klein, 2014). Among current smokers, e-cigarette use is associated with higher socioeconomic status, smoking more cigarettes, and having a quit attempt within the past year (Brown et al., 2014). However, 32.5% of current e-cigarette users are never or former smokers (McMillen, Gottlieb, Shaefer, Winickoff, & Klein, 2014). Thus, e-cigarettes contribute to primary nicotine addiction and to the renormalization of tobacco use (Fairchild, Bayer, & Colgrove, 2014). Akin to smoking bans, regulatory action is needed at the federal, state, and local levels to ensure that these products do not contribute to preventable chronic disease.

*Characteristics of Individuals at Risk* Large disparities in tobacco use remain across racial/ethnic groups and between groups defined by educational level, socioeconomic status, geographic region, sexual minorities (including GLBTQ individuals), and those with severe mental illness (U.S. Department of Health and Human Services, 2014). Specifically, daily use of tobacco is associated with female gender, White race, lower educational status, living at or above the poverty line, and living in the Midwest region of the U.S. (U.S. Department of Health and Human Services, 2014). Adults 18–25 and 26–44 years of age have the highest prevalence rates of

tobacco use; tobacco use then declines with age. Furthermore, there is a continued rise in young adult smoking even as youth rates decline (Dietz, Sly, Lee, Arheart, & McClure, 2013). Finally, lifestyle (participation in organized activities, health status, use of other substances) and social variables (family members' and/or peers' tobacco use) also predict tobacco use (Pederson, Koval, Chan, & Zhang, 2007).

*Barriers to Prevention* Tobacco cessation interventions are underutilized in clinical practice despite being the most cost-effective health promotion strategy to reduce morbidity and mortality (Goldstein et al., 1998; Sarna et al., 2000; Vogt et al., 1998). This gap is illustrative of the “implementation cliff” or the lack of translation of effective interventions to clinical practice (Weisz, Ng, & Bearman, 2014). Self-identified barriers cited by oncology nurses and primary care physicians include limited knowledge and skills to do tobacco interventions, lack of time, lower patient priority compared to other clinical interventions, and the lack of consistent institutional expectations (Sarna, Wewers, Brown, Lillington, & Brecht, 2001; Sonmez et al., 2015). Additionally, a sizeable minority of nurses, general practitioners, and family physicians have negative beliefs and attitudes toward discussing smoking with their patients (Vogt, Hall, & Marteau, 2005). The most common negative beliefs are that such discussions are too time-consuming (weighted proportion, 42%) and are ineffective (38%). Other common negative beliefs include lacking confidence in one's ability to discuss smoking with patients (22%) or one's knowledge (16%) and feeling that such discussions are unpleasant (18%).

*Guidelines for Prevention* In 2008, the CDC's National Health Interview Survey reported that 20.6% of adults aged 18 years and older were current cigarette smokers. The U.S. Department of Health and Human Services has set the goal of decreasing this number to 12% by the year 2020 (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016). In order to achieve this goal, the U.S. Preventive Services Task Force recommends that clinicians ask all adults about tobacco use and provide tobacco cessation interventions (including counseling and/or pharmacotherapy) for those who use tobacco products (U.S. Preventive Services Task Force, 2015).

Recently (2016) the National Comprehensive Cancer Network (NCCN) published smoking cessation treatment guidelines to be used by oncology professionals. For patients who are not ready to quit, providers should engage in motivational talk about smoking cessation, reviewing the health risks of smoking and the benefits of quitting and providing patient education. In addition, a patient's readiness to quit should be reassessed at each visit. For patients who are still smoking and say they want to quit, or for persons who have recently quit smoking, pharmacotherapy (such as short-acting nicotine replacement therapy [NRT]) and behavior therapy can be considered. Behavioral scientists have multiple skills (see concluding remarks below) that could aid facilities in meeting these guidelines.

*Behavioral Care: Options and Efficacy* Effectiveness of behavioral interventions for tobacco use has been reported for many types of interventions, including group



behavioral therapy, individual therapy, physician counseling, telephone counseling, nursing interventions, and tailored self-help interventions (Lancaster & Stead, 2005; Lemmens, Oenema, Knut, & Brug, 2008; Lichtenstein, Glasgow, Lando, Ossip-Klein, & Boles, 1996; Strecher, 1999). These types of interventions are in line with treatment recommendations from the NCCN and USPSTF. Furthermore, the efficacy of behavioral treatments for smoking cessation is extremely reliable, in that 14 meta-analyses demonstrated 100% concordance on the presence/absence of efficacy of 17 different smoking cessation interventions (Hughes, 2009). However, the magnitude of effects of these interventions is not large (Hughes, 2009), and effects for maintenance are lower. Even the best tobacco use programs do not exceed a 50% abstinence rate (Piasecki, 2006). While intensive intervention, telephone counseling, and the use of pharmacotherapy have been found to improve outcomes to 24 months, they reach relatively few users (Ockene et al., 2000). Ockene et al. (2000) suggest that brief interventions during medical visits could be cost-effective and have high reach.

Tobacco use interventions delivered by healthcare providers have been of particular interest. Not only do smokers come into contact with the healthcare system on a frequent basis, smokers often cite the importance of physician advice in influencing their decision to quit smoking (Niaura & Abrams, 2002). Although there is little evidence that extensive physician training effects smoking cessation outcomes (Ferketich et al., 2014), there *is* a dose-dependent relationship between the intensity of physician contact and successful cessation outcome (Fiore, 2000). Evidence demonstrates that physician offers of assistance (e.g., behavioral support for cessation, offering nicotine replacement therapy) generate more quit attempts than physician merely giving advice to quit on medical grounds (Aveyard, Begh, Parsons, & West, 2012).

## *Alcohol Use*

*Nature of the Problem* Like tobacco use, alcohol use is a modifiable risk factor. Praud et al. (2013) used global estimates of cancer causes and World Health Organization (WHO) estimates on the prevalence of drinkers to estimate the total number of alcohol-attributable cancer cases. Over the 10-year period considered, approximately 770,000 cancer cases could be attributed to alcohol consumption worldwide (5.5% of the total number of cancer cases). These authors concluded that a high burden of cancer morbidity is attributable to alcohol and that public health measures should be developed regarding alcohol consumption (Praud et al., 2013). However, it should be noted that the majority of these studies have examined heavy alcohol drinking; because of probable confounding, the role of light-to-moderate drinking remains unclear (Klatsky et al., 2015).



*Characteristics of Individuals at Risk* The so-called problem drinkers fall into two categories. Binge drinking is defined as consuming four or more alcoholic beverages per occasion for women or five or more drinks per occasion for men. According to national surveys, one in six U.S. adults binge drinks about four times a month, consuming about eight drinks per binge (Center for Disease Control, 2012). However, binge drinking is more common among men, among young adults aged 18–34 years, and among those with household incomes of \$75,000 or more. Heavy drinking, on the other hand, is defined as consuming 8 or more alcoholic beverages per week for women or 15 or more alcoholic beverages per week for men. Although there are similarities between binge drinkers and heavy drinkers, a 2011 study by King and colleagues attempted to assess the unique characteristics of heavy drinkers via a prospective study. They demonstrated that, compared with light drinkers, heavy drinkers exhibited higher alcohol sensitivity, in terms of subjective stimulation and reward (liking and wanting), as well as lower sensitivity, in terms of subjective sedation and salivary cortisol reactivity (King, de Wit, McNamara, & Cao, 2011; King, Hasin, O'Connor, McNamara, & Cao, 2016). In behavioral economics terms, heavy drinkers simply find alcohol to be more rewarding than light drinkers (Tucker et al., 2016).

*Barriers to Prevention* Like tobacco use interventions, alcohol use interventions have been demonstrated to be efficacious in the context of primary care (Babor et al., 2007; Kaner et al., 2009; Madras et al., 2009; Vasilaki, Hosier, & Cox, 2006). However, physicians and nurses frequently identify barriers to implementation of alcohol use interventions (Coloma-Carmona, Carballo, & Tirado-González, 2016). Commonly reported barriers include the belief that patients will lie about their actual consumption and will not identify its negative consequences and the belief that patients will reject participating in an intervention for their alcohol consumption.

*Guidelines for Prevention* To reduce the risk of alcohol-related harms, the 2015–2020 U.S. Dietary Guidelines for Americans recommends that if alcohol is consumed, it should be consumed in moderation—up to one drink per day for women and two drinks per day for men. However, data from the 2008 National Survey on Drug Use and Health (NSDUH) demonstrate that 28.2% of adults aged 18 years and older reported that they drank excessively in the previous 30 days. Furthermore, only 8.2% of persons aged 12 years and older who needed alcohol treatment reported that they received specialty treatment for abuse or dependence in the past year in 2008.

The American Society of Addiction Medicine recommends a stepped care model for the treatment of alcohol use (American Society of Addiction Medicine, 1997). Specifically, they suggest that primary care providers routinely screen for the presence of alcohol use problems in patients, screen for risk factors for development of alcohol dependence, and provide appropriate interventions. For patients who drink

alcohol at risk levels (the abovementioned “problem drinkers”), appropriate referrals should be provided.

*Behavioral Care: Options and Efficacy* Consistent with a stepped care model, treatments to reduce alcohol use come in two primary forms: brief intervention and extended intervention. Brief interventions typically consist of a single, 30-min session (Landy, Davey, Quintero, Pecora, & McShane, 2016); however, there is little evidence that such interventions are effective (Havard, Shakeshaft, Conigrave, & Doran, 2012; Landy, Davey, Quintero, Pecora, & McShane, 2016).

Extended interventions include three well-developed protocols with strong research backing: (1) 12-step programs, (2) cognitive behavioral therapy (CBT), and (3) motivational interviewing. First, there are a variety of 12-step approaches, including Alcoholics Anonymous (AA), but all are based on the assumption that substance dependence is a medical and/or spiritual disease (Nowinski, Baker, & Carroll, 1992). The 12-step approach consists of a brief, structured, manual-driven approach to facilitating recovery from alcohol abuse implemented over 12–15 sessions. These groups are widely available and are well known in many countries. Second, a variety of cognitive behavioral interventions for alcohol use have also been developed, differing in length, modality, content, and treatment setting (Morgenstern & Longabaugh, 2000). Despite differences, CBT for alcohol use has two core elements: a focus on Bandura’s social-cognitive theory (e.g., deficits in coping skills serve to maintain excessive drinking) and coping skills training to address said deficits. Finally, motivational interviewing (MI) is a client-centered, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence (Miller & Rollnick, 2002). Five key principles underlay MI. First, it emphasizes the individual’s present interests and problems. Second, it involves selective responding to the client’s speech in a way that resolves ambivalence and motivates the person to change. Third, it is a method of communication rather than a set of techniques. Fourth, it focuses on intrinsic motivation for change. Fifth, within this approach, change occurs because of its relevance to the person’s own values (Miller & Rollnick, 2002).

These three treatments have been shown to be efficacious (Allen, Anton, Babor, & Carbonari, 1997), though the mechanisms for such are unclear despite study (Longabaugh et al., 2005; Morgenstern & Longabaugh, 2000). Therefore, the differentiation between programs may come from the ease of implementation and/or referral (Dennis, Perl, Huebner, & McLellan, 2000; Rieckmann, Kovas, Fussell, & Stettler, 2009; Roman & Johnson, 2002). In the context of primary care, screening for risky alcohol use in medical settings, providing brief interventions for those who drink above low risk drinking limits, and referring those at risk for an alcohol use disorder to specialized treatment (SBIRT) have proven effective for reducing alcohol use and alcohol-related consequences (Babor et al., 2007; Kaner et al., 2009; Madras et al., 2009; Vasilaki, Hosier, & Cox, 2006).

## ***Physical Activity, Diet, and Nutrition***

*Nature of the Problem* It has been estimated that 30–40% of all cancers can be prevented by physical activity, dietary changes, and maintenance of appropriate body weight (Renehan, Tyson, Egger, Heller, & Zwahlen, 2008; World Cancer Research Fund & American Institute for Cancer Research, 2007), and it is likely to be higher than this for some individual cancers. Increased body weight is associated with increased risk of many malignancies, although some of these associations differ based on gender. Among men, a 5 kg/m<sup>2</sup> increase in body mass index (BMI) has been related to increased risk of esophageal, thyroid, colorectal, and renal cancers (Renehan et al., 2008). In women, the same 5 kg/m<sup>2</sup> increase in BMI has been related to increased risk of endometrial, gallbladder, esophageal, and renal cancers (Renehan et al., 2008). Body fatness also increases the risk of breast cancer among postmenopausal women (Ligibel & Strickler, 2013; World Cancer Research Fund & American Institute for Cancer Research, 2007). Finally, there is preliminary evidence for a link between BMI and thyroid cancer (Peterson, De, & Nuttall, 2012).

The most common weight management interventions target physical activity and/or diet. Physical activity is a modifiable lifestyle risk factor that has the potential to reduce the risk of most major cancer sites (Friedenreich, Neilson, & Lynch, 2010). However, the positive effects of physical activity on cancer risk extend beyond overall reduction in body weight. Analyses controlling for body weight demonstrate that 4 or more hours per week of exercise results in a statistically significant reduction in cancer risk (Thune, Brenn, Lund, & Gaard, 1997). Hypothesized biological mechanisms include a likely effect of physical activity on insulin resistance, body composition, sex hormones, and metabolic hormones and a possible effect on vitamin D, adipokines, inflammation, and immune function (Friedenreich, Neilson, & Lynch, 2010; McTiernan, 2008).

The relationship between diet and cancer is also complex. While there is mixed evidence for the effects of specific micronutrients (e.g., vitamins, antioxidants, etc.) on cancer incidence (Bardia et al., 2008), several studies have demonstrated significant effects for types of foods eaten (e.g., fruits, vegetables, meat, fat, etc.). Specifically, high consumption of fiber (e.g., fruit, vegetables, and whole grains) is hypothesized to be protective, while high consumption of fat and meat is hypothesized to increase risk. Several studies have demonstrated a protective effect of fruit and vegetable consumption on cancer risk (Block, Patterson, & Subar, 1992; Chan, Gann, & Giovannucci, 2005; Gandini, Merzenich, Robertson, & Boyle, 2000; McGarr, Ridlon, & Hylemon, 2005; Slattery, Curtin, Edwards, & Schaffer, 2004). Furthermore, one case-control study demonstrated evidence supportive of the hypothesis that whole-grain intake protects against various cancers (Jacobs, Marquart, Slavin, & Kushi, 1998). On the other hand, high intake of animal fat and meat has been associated with an increased cancer risk (Kolonel, 2001; Sandhu, White, & McPherson, 2001). In summary, diet has been implicated in the etiology of cancer, but definitive etiologic evidence is lacking (Dagnelie, Schuurman, Goldbohm, & Van Den Brandt, 2004). Aside from following general dietary

recommendations for healthy eating, there is no clear evidence that specific dietary components can effectively reduce cancer risk.

*Characteristics of Individuals at Risk* Overweight and obesity disproportionately affect certain demographic groups in the U.S. Overweight and obese adults are more likely to be male (70.9% of males vs. 61.9% of females), African-American (71.5% of African-Americans vs. 62.7% of Whites), and Hispanic or Latino (70.2% of Hispanic/Latino persons vs. 61.1% of non-Hispanic/non-Latino persons) (Ng et al., 2014; Nugent, Black, & Adams, 2016). Education and poverty status are also associated with higher rates of overweight and obesity, particularly when comparing the most extreme groups. For example, 71.2% of those with an educational level less than a high school diploma are overweight or obese, compared to 55.4% of those with a Master's degree, professional degree, or doctoral degree (Nugent et al., 2016). Similarly, 63% of those individuals living at or below the poverty line are overweight or obese, compared to 59.5% of those earning 400% of the poverty threshold or greater (Nugent et al., 2016).

*Barriers to Prevention* Several barriers to the successful implementation of weight loss programs exist. First, patient access to comprehensive programs is limited (Cole, Keppel, Andrilla, Cox, & Baldwin, 2016; Moyer, 2012; Ogden, Carroll, Kit, & Flegal, 2013), and in many cases, treatments are only partially covered by insurance (Koh & Sebelius, 2010; Madison, Schmidt, & Volpp, 2016; Weiner & Colameco, 2014). For example, Medicare only reimburses or pays for obesity counseling and treatment provided during in-person, face-to-face visits, creating potential financial barriers for patient participation in weight loss programs (Centers for Medicare and Medicaid Services, 2011). The coordinated infrastructure required to implement in-person comprehensive weight loss programs may serve as a barrier to health systems offering these successful programs. Thus, it is imperative to consider alternative approaches to providing these programs, such as remote programs delivered through mobile and web support (Appel et al., 2011; Hamar, Coberley, Pope, & Rula, 2014). Such interventions could minimize cost, location, and convenience as barriers to weight loss program participation (Jensen et al., 2014).

Second, barriers exist at the level of the physician. Primary care physicians report discomfort with discussing obesity and weight loss with patients, and only a minority of obese adults report having received weight loss counseling from a physician (Epling, Morley, & Ploutz-Snyder, 2011; Felix, West, & Bursac, 2008; Galuska, Will, Serdula, & Ford, 1999; Huang et al., 2004; Shiffman et al., 2009). When physicians do, it is often to prescribe weight loss medications not accompanied by appropriate counseling (Shiffman et al., 2009). Physician's insufficient guidance on weight management strategies may be due to inadequate counseling skills and/or lack of confidence (Huang et al., 2004).

Maintenance of effects poses a third and final barrier. Continued coach contact and self-monitoring are among a small number of strategies that can effectively prevent or reduce weight regain (Jeffery et al., 2000; Turk et al., 2009). However,

their cost to implement (e.g., staffing requirements, participant burden) poses significant access and adherence barriers (Xiao, Yank, Wilson, Lavori, & Ma, 2013).

*Guidelines for Prevention* Between 2005 and 2008, only 30.8% of U.S. adults were considered to be at a healthy weight, and 33.9% were obese (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016). By the year 2020, the national target is to increase the number of individuals at a healthy weight to 33.9%, while simultaneously decreasing the number of obese individuals to 30.5% (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016).

Current physical activity guidelines suggest that adults should engage in both aerobic physical activity (a minimum of either 150 min at a moderate intensity or 75 min at a vigorous intensity) and muscle-strengthening activities (2 or more days per week) (U.S. Department of Health and Human Services, 2008). Furthermore, it is recommended that all adults should avoid inactivity. However, only 20% of adults meet the physical activity guidelines for aerobic and muscle-strengthening activity (U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015). Males are more likely to report doing regular physical activity compared to females (24% of males vs. 17% of females meet recommendations). Furthermore, about 30% of adults report engaging in no leisure time physical activity. Disparities also exist; individuals with lower income and those with lower educational attainment have lower rates of physical activity and are more likely to not engage in leisure time physical activity (U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015).

The U.S. Department of Agriculture published revised *Dietary Guidelines for Americans* in December 2015. These guidelines include five key recommendations that encourage healthy eating patterns: (1) follow a healthy eating pattern across the life span; (2) focus on variety, nutrient density, and amount; (3) limit calories from added sugars and saturated fats and reduce sodium intake; (4) shift to healthier food and beverage choices; and (5) support healthy eating patterns for all (U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015). Unfortunately, the typical eating patterns do not align with these dietary guidelines. Specifically, about three-fourths of the population has an eating pattern that is low in vegetables, fruits, dairy, and oils, while more than half of the population is meeting or exceeding total grain and total protein foods recommendations (U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015). In addition, most Americans exceed the recommendations for added sugars, saturated fats, and sodium, and the eating patterns of many are too high in calories. Taken together, the lack of adherence to physical activity and dietary recommendations may be responsible for the obesity epidemic in the U.S. (Wang & Beydoun, 2007).

*Behavioral Care: Options and Efficacy* The typical targets of behavioral weight management interventions are physical activity and dietary habits. Wadden, Brownell, and Foster (2002) proposed a three-stage process for selecting treatment

for overweight and obesity (defined as a body mass index (BMI) greater than 25 kg/m<sup>2</sup>). First, patients are divided into four levels based on BMI:

- Level 1: BMI < 27 kg/m<sup>2</sup>
- Level 2: BMI 27–29 kg/m<sup>2</sup>
- Level 3: BMI 30–39 kg/m<sup>2</sup>
- Level 4: BMI ≥ 40 kg/m<sup>2</sup>

All individuals are encouraged to control their weight, increasing their physical activity and making dietary changes. When this approach is not successful, more intensive intervention might be warranted, as in a “stepped care” model (Wadden, Brownell, & Foster, 2002). A matching decision is based on the individual’s prior weight loss effort, treatment preferences, and need for weight reduction (as judged by the presence of comorbid conditions or other risk factors). Wadden and colleagues also recommend adjunct psychological counseling for these patients. Regardless of the treatment selected, the goal of treatment is attainment of a healthier weight.

Although behavioral weight management interventions achieve clinically significant weight losses of 8–10% (Butryn, Webb, & Wadden, 2011; Jeffery et al., 2000), only 40–60% of people achieve this goal (Unick, Jakicic, & Marcus, 2010). Furthermore, improving the maintenance of weight loss remains the critical challenge for all weight management approaches. Patients identify many barriers to maintenance of changes post-intervention (Morgan et al., 2016). In a classic series of studies, Perri and colleagues (Perri et al., 1988; Perri, Nezu, & Viegner, 1992) demonstrated that continuing behavioral care (provided via phone, mail, or in person) improved the maintenance of weight loss. However, patient participation in maintenance sessions tends to decline over time, requiring the development of innovative, integrated healthcare approaches in the long term.

Primary care weight management interventions illustrate a wide range of strategies but hold promise nonetheless (Ball, Leveritt, Cass, & Chaboyer, 2015; Bhattarai et al., 2013; Sanchez, Bully, Martinez, & Grandes, 2015; Simons-Morton, Calfas, Oldenburg, & Burton, 1998). In an illustrative example, Kallings, Leijon, Hellénus, and Ståhle (2008) investigated the efficacy of a physical activity intervention in the primary care context. Almost 500 patients were “prescribed” individualized physical activity programs by their primary care physician. Results demonstrated significant increases in self-reported physical activity and motivation for physical activity (Kallings, Leijon, Hellénus, & Ståhle, 2008). However, the consistency and clinical significance of primary care weight management interventions are unclear (Booth, Prevost, Wright, & Gulliford, 2014), and further research is needed to establish the optimal design and delivery (Ball, Leveritt, Cass, & Chaboyer, 2015; Gagliardi, Faulkner, Ciliska, & Hicks, 2015). For example, incorporating motivational interviewing techniques may increase long-term adherence (Hutchison, Breckon, & Johnston, 2009; McGrane, Galvin, Cusack, & Stokes, 2015). Additionally, long-term weight loss is increased when diet and physical activity are combined (Johns, Hartmann-Boyce, Jebb, & Aveyard, 2014). Thus, multicomponent interventions



may yield the best results for maintenance of appropriate weight. Finally, Tulloch, Fortier, and Hogg (2006) suggest that stronger effects may come from interdisciplinary collaboration, in which providers refer patients to specialists.

## ***Virus Exposure***

*Nature of the Problem* Certain cancers are related to infectious agents, and exposures to these cancers could be avoided through education or vaccination (American Cancer Society, 2016b). Research suggests that almost all cervical cancer cases are caused by the human papillomavirus (HPV), for which two vaccines have been developed (Garland et al., 2007; Harper, 2008; The FUTURE II Study Group, 2007). Vaccination programs, along with education to reduce exposure risk (Anhang, Goodman, & Goldie, 2004; Fu, Bonhomme, Cooper, Joseph, & Zimet, 2014; Pierce Campbell, Menezes, Paskett, & Giuliano, 2012), would be an effective primary prevention strategy for cervical cancer. In fact, widespread HPV vaccination may reduce cervical cancer incidence by as much as 77% (Smith et al., 2007), and vaccination may be particularly important for populations at high risk for cervical cancer (Reiter, Katz, & Paskett, 2012).

*Characteristics of Individuals at Risk* Worldwide, the prevalence of HPV infections among women is about 10% (Clifford et al., 2005; De Sanjosé et al., 2007). However, there are significant age disparities in HPV prevalence, whereby women under the age of 35 years have the highest HPV prevalence (De Sanjosé et al., 2007). For instance, among college women in the U.S., HPV prevalence was 24.4% (Burk et al., 1996; Winer et al., 2003). In addition, individuals of Black or Hispanic ethnicity are at increased risk for HPV infection (Burk et al., 1996; Ley et al., 1991). Finally, the major behavioral risk factors for HPV infection are related to sexual activity (*IARC monographs on the evaluation of carcinogenic risks to human: Human papillomaviruses*, 2007), including acquisition of new male sexual partners, an increasing number of lifetime sexual partners in both females and their male partners (Burk et al., 1996; Karlsson et al., 1995; Kjaer et al., 1997, 2001; Ley et al., 1991; Vaccarella et al., 2006), having non-monogamous male partners, an increase in the age differences between women and their first sexual partner, long-term oral contraceptive use (Kjaer et al., 2001; Ley et al., 1991), and history of chlamydia infections (Kjaer et al., 1997).

Many of these risk factors can be accounted for by early age at first sexual intercourse (Kahn, Rosenthal, Succop, Ho, & Burk, 2002). In turn, sexual debut is predicted by a complex array of family, peer, and environmental factors (French & Dishion, 2003; James, Ellis, Schlomer, & Garber, 2016; Kaplan, Jones, Olson, & Yunzal-Butler, 2013). However, the proportion of adolescent females (ages 15–17) who report having ever had sexual intercourse differs by race, ethnicity, and socioeconomic status (U.S. Department of Health and Human Services Office of Disease



Prevention and Health Promotion, 2016). Specifically, a greater proportion of non-Hispanic White (34.7% vs. 26.2%) and higher socioeconomic status adolescents (33.1% vs. 26.9%) report having ever had sexual intercourse.

Furthermore, disparities in HPV vaccination uptake exist by location, race, and ethnicity. In 2014, Hispanic and Latinos had the highest vaccination rates, at 44.1% (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016). This rate was 1.334 times the average rate for all other race/ethnicity groups, and 1.625 times the worst group rate (27.2% of the American Indian/Alaska Native population). This finding may be confounded with the disparities by geographic location: 34.7% of individuals living in a metropolitan location were vaccinated, compared to 32.2% of individuals living in a rural location (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016).

*Barriers to Prevention* Behavioral factors have been related to HPV vaccination uptake. Patient-reported barriers include cost, feelings that vaccination was unnecessary, concerns that vaccination would promote adolescent sexual behavior, and concerns regarding vaccine safety and side effects (Brewer & Fazekas, 2007; Rambout, Tashkandi, Hopkins, & Tricco, 2014). Brewer and Fazekas (2007) found that vaccination acceptability was higher when people believed the vaccine was effective and that HPV infection was likely. Physician recommendation has also been identified as particularly important (Rosenthal et al., 2011). Thus, HPV vaccine programs in the U.S. should emphasize high vaccine effectiveness, the high likelihood of HPV infection, and physicians' recommendations, as well as addressing barriers to vaccination.

*Guidelines for Prevention* Current recommendations suggest that all females ages 11–12 receive the HPV vaccine (Petrosky et al., 2015). However, only 40% of 13- to 17-year-old females in the U.S. had received all 3 doses as of 2014 (Reagan-Steiner et al., 2015), and only 28.1% had done so by the recommended age of 15 (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016). The U.S. Department of Health and Human Services has set the goal of increasing this number to 80% by the year 2020 (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016).

*Behavioral Care: Options and Efficacy* Intervention strategies to address barriers to HPV vaccination, many of which can increase HPV vaccination coverage with modest cost (Smulian, Mitchell, & Stokley, 2016), include educational interventions and clinic-based interventions (Beavis & Levinson, 2016). Mixed results have been reported for purely educational interventions (Bennett et al., 2015; Foley et al., 2015; Gargano et al., 2013). Given the variability in results, it is unclear what impact educational interventions alone would ultimately have on HPV vaccine uptake (Fu, Bonhomme, Cooper, Joseph, & Zimet, 2014). Clinic-based interventions, on the other hand, have been encouraged by the Centers for Disease Control (CDC) as a

way to bridge the gap between vaccine recommendations and uptake (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016). For example, one cluster randomized controlled trial demonstrated that focused clinician education, electronic health record-based alerts, and quarterly performance feedback for physicians led to a modest increase in vaccine initiation (Fiks et al., 2013). Despite these promising results, authors caution that clinic-based interventions such as this should be considered an adjunct to a vaccine promotion program (Beavis & Levinson, 2016).

### *An Example: Primary Prevention of Cardiovascular Disease*

An important barrier to the delivery of health behavior change interventions in primary care settings is the lack of an integrated screening and intervention approach that can cut across multiple risk factors and help clinicians and patients to address these risks in an efficient and productive manner (Goldstein, Whitlock, & DePue, 2004). Thus, in order to improve primary prevention of cancer, healthcare providers must systematically assess and address risk factors for the disease. While comprehensive, individualized programs in cancer control are rare, this approach is frequently utilized in prevention of cardiovascular disease (CVD). The approaches developed in the CVD literature may be easily translated to cancer control.

Clinicians and researchers in CVD often utilize the Framingham risk score algorithm to predict events related to coronary heart disease (CHD) (Wilson et al., 1998). This algorithm has been validated in various populations, and several modifiable risk factors emerge, including (1) hypertension, (2) high cholesterol, (3) obesity, (4) physical inactivity, and (5) smoking (Mendy & Vargas, 2015). Once a patient is assessed according to the Framingham risk score algorithm, he or she is referred for appropriate behavioral treatment. According to the American Heart Association, the best behavioral treatment for CHD patients involves comprehensive lifestyle changes, including increased physical activity and a high-fiber diet (Lichtenstein et al., 2006). Efficacious behavioral interventions have been designed to reduce CVD risk factors. A variety of behavioral interventions have been used, including physical activity, diet, and smoking cessation, as well as a combination of these components (Belardinelli, Georgiou, Cianci, & Purcaro, 1999; Giannuzzi et al., 2008; Hu & Willett, 2002; Lisspers et al., 2005; O'Connor et al., 2009; Ornish et al., 1998; Pischke, Scherwitz, Weidner, & Ornish, 2008; Singh et al., 1992; Toobert, Glasgow, & Radcliffe, 2000; Wang et al., 2006).

The primary prevention behavioral interventions developed for high-risk CVD populations might be effectively applied in the context of cancer control. Akin to the American Society of Clinical Oncology's screening guidelines for depression and anxiety (Andersen et al., 2014), we present a decision tree for behavioral referrals in a primary prevention context (see Fig. 14.2). It is recommended that all patients in primary care be evaluated for risk factors for cancer at initiation of primary care and at periodic intervals in care provision. If multiple risk factors are identified,

individuals should have further assessment to identify the nature and extent of problematic health behaviors. Following assessment, patients should be provided behavioral support according to their level of risk. In accordance with a stepped care model, patients are classified as low risk, moderate risk, and high risk. Furthermore, treatment tailoring is recommended: patients should receive intervention components that are relevant to their identified risk factors.

Patients designated as low risk will receive education-only support. Patients designated as moderate risk will be prescribed lifestyle changes tailored to their individual risk factors. Finally, patients designated as high risk will be prescribed a comprehensive, multiple behavior change intervention. Research supports the efficacy of multiple behavior change interventions in promoting lifestyle changes. Rather than hindering behavior change, additional behavioral components may in fact promote behavior change. Spring et al. (2009) reviewed evidence to determine the efficacy of a behavioral intervention to both promote smoking cessation and prevent weight gain among healthy adults. Meta-analytic results found that patients who received both smoking treatment and weight treatment showed increased abstinence and reduced weight compared with patients who received smoking treatment alone. These results have been extended to adults at risk for CHD (Steptoe, Kerry, Rink, & Hilton, 2001; Ward, White, & Druss, 2015), individuals at risk for type 2 diabetes (Greaves et al., 2011), and patients at risk for cancer (Spring, King, Pagoto, Van Horn, & Fisher, 2015). In short, multiple health behavior interventions may have additional value, above and beyond the additive effects of intervention components (Kirk, Penney, McHugh, & Sharma, 2012). This is reflected in the care map provided in Fig. 14.2.

## Secondary Prevention

Secondary prevention aims to identify abnormal changes that precede the development of malignancy (Alberts & Hess, 2008), thus preventing the cancer from fully developing. This is done by detecting an existing disease prior to the appearance of symptoms (American Cancer Society, 2015). There is strong evidence that screening reduces mortality from breast, cervical, and colorectal cancers (American Cancer Society, 2015).<sup>1</sup>

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<sup>1</sup> While screening is also shown to reduce mortality for lung cancer among long-term and/or heavy smokers (e.g.,  $\geq 30$  pack-year smoking history), it is not recommended for the general population. For that reason, we have chosen not to review it here.

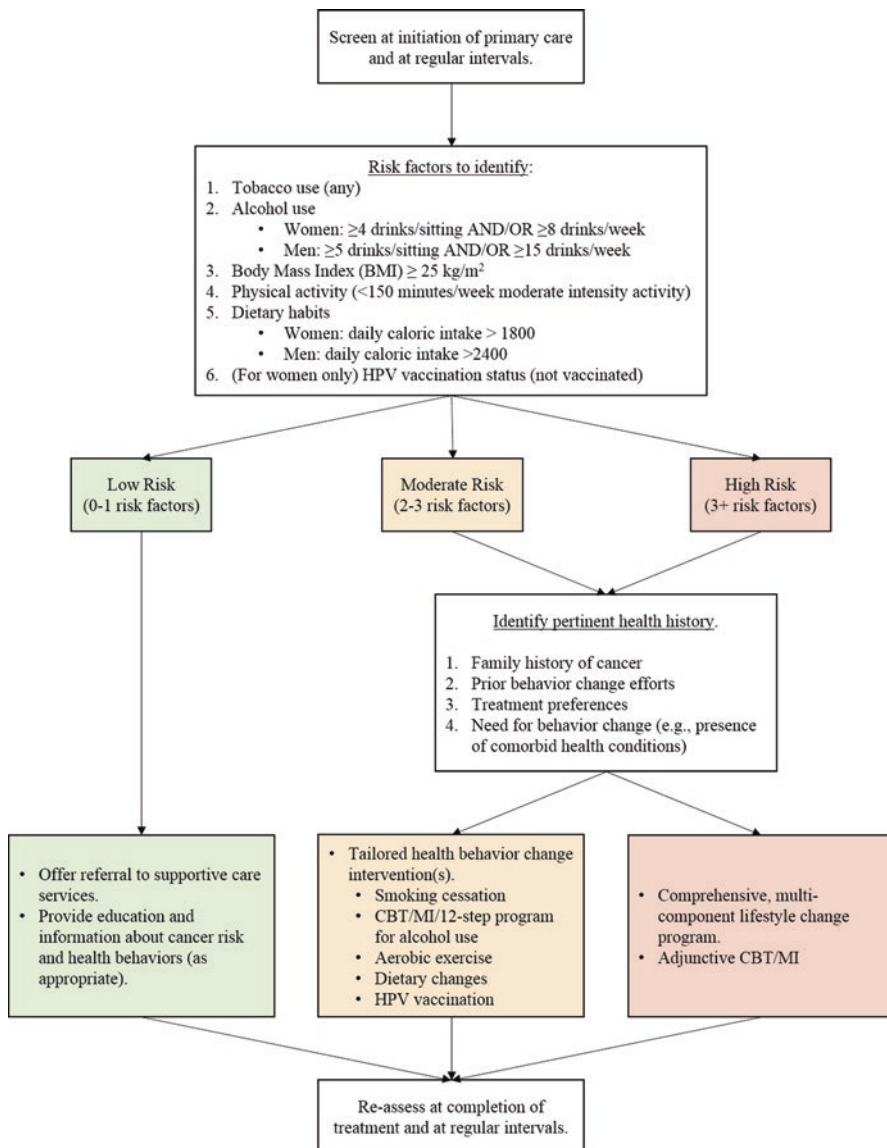


Fig. 14.2 Screening, assessment, and care recommendations for primary prevention of cancer

## ***Breast Cancer***

*Nature of the Problem* Mammography screening is the most effective early detection method (Henry, McDonald, Sherman, Kinney, & Stroup, 2014; Nelson et al., 2009).<sup>2</sup> Despite its efficacy, many remain unscreened (Onitilo et al., 2014). For women above 40 in the U.S., rates of mammography screening have remained between 50% and 80% since 2000 (Breen et al., 2007; Hirsch & Lyman, 2011; National Center for Health Statistics, 2012).

*Characteristics of Individuals at Risk* Compared to non-Hispanic White, U.S.-born women, minority and foreign-born women report lower rates of mammograms, even though they have increased risk breast cancer risk (Elewonibi, Thierry, & Miranda, 2016). In 2014, 73.3% of Whites had received a mammogram within the past 2 years, compared to 66.7% of the Hispanic or Latino population (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016).

While mammography screening rates have improved nationally in the past 20 years (Doescher & Jackson, 2009), they are consistently lower among rural women (Engelman et al., 2002; Paskett et al., 2004), who are also less likely to be in line with recommended screening timeframes (Horner-Johnson, Dobbertin, & Iezzoni, 2015). *Healthy People 2020* highlights this discrepancy: 73.7% of urban women receive screening, compared to 61.7% of rural women (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016).

*Barriers to Prevention* One of the most robust findings is that mammography compliance is significantly associated with access to a regular healthcare provider (Carney et al., 2012; Henry et al., 2014; Kempe, Larson, Shetterley, & Wilkinson, 2013; Peppercorn et al., 2015). In addition, no provider recommendation or referral for screening is another common barrier (Breen & Kessler, 1994; Carr et al., 1994; Kruse & Phillips, 1987; Love et al., 1993; Mayne & Earp, 2003; Meissner, Breen, Klabunde, & Vernon, 2006; Meissner, Klabunde, Breen, & Zapka, 2012; Rimer, Trock, Engstrom, Lerman, & King, 1991). Paskett et al. (2004) found that 67% of women reported that a physician had never encouraged them to receive a mammogram, even though 75% had reported receiving a regular checkup in the past year. This may be due to providers' attitudes: one study of rural primary care physicians identified the prevalent belief that patient factors (e.g., SES, low educational attainment, fatalism, lack of knowledge, etc.) will lead patients to non-compliance despite physicians' best efforts (Shell & Tudiver, 2004).

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<sup>2</sup>Current U.S. Preventive Services Task Force (USPSTF) recommendations advise against clinicians teaching women how to perform breast self-examination (U.S. Preventive Services Task Force, 2016).

When mammography is recommended, other factors may impede it from occurring (Henry et al., 2014). Attitudes about the procedure (e.g., regarding the convenience, comfort) or its accuracy are important, as women having more favorable attitudes toward annual mammography also report stronger intentions to obtain one in the next year (Lantz, Weigers, & House, 1997; Steele & Porche, 2005). It is encouraging that positive change in attitudes is associated with mammography use (Rauscher, Hawley, & Earp, 2005). A second frequently identified barrier to screening is the time required to have a mammogram; in several surveys, time was endorsed as a barrier by as many as 24% of participants (Murimi & Harpel, 2010; Paskett et al., 2004; Peppercorn et al., 2015). Finally, limited health literacy is a barrier (Bennett & Chen, 2009; Cho, Lee, Arozullah, & Crittenden, 2008; Davis, Arnold, Berkel, & Nandy, 1996; White, Chen, & Atchison, 2008), as is lack of knowledge about breast cancer prevention (Elnicki, Morris, & Schockor, 1995).

*Guidelines for Prevention* The ACS and the United States Preventative Services Task Force (USPSTF) have published recommendations for the frequency of mammography (American Cancer Society, 2015; U.S. Preventive Services Task Force, 2016). While there is some discrepancy in recommendations, there is consensus that women should have biennial mammograms beginning in their 50s.

*Behavioral Care: Options and Efficacy* Sohl and Moyer (2007) conducted a meta-analysis of individual-level interventions (including telephone, print, and in-person interventions) for promoting mammography use. They found that women exposed to all three types of interventions were significantly more likely to get a mammogram ( $p < 0.001$ ). Further, Davis et al. (2014) evaluated the effectiveness and cost-effectiveness of three additional, more intensive, individual-level interventions designed to promote mammography: enhanced care, health literacy-informed education of patients, and education plus nurse support. While mammography rates increased substantially over existing baseline rates in all three arms, the education plus nurse support arm was the most effective. However, in a meta-analysis of manuscripts published between 1984 and 1997, Legler et al. (2002) found that multilevel approaches to promote mammography had the greatest impact. Specifically, a combination of access-enhancing (e.g., transportation to appointments, facilitated scheduling, mobile vans, vouchers, and reduced cost mammograms) and individual-directed strategies (e.g., one-on-one counseling, letters and reminders, and telephone counseling) demonstrated the strongest effects (an estimated 27% increase in mammography use across nine studies [95% confidence interval: 9.9%–43.9%]). Therefore, both individual and multilevel behavioral interventions for increasing mammography rates have promise.

## *Cervical Cancer*

*Nature of the Problem* The Papanicolaou, or Pap smear, screening test is used to detect precancerous changes within the cervix (Everett, Bryant, Griffin, Martin-hirsch, & Carol, 2014). The incidence of cervical cancer is reduced by 93.5%, 92.5%, 90.8%, 83.6%, and 64.1% if women have screening every year, every 2 years, every 3 years, every 5 years, and every 10 years, respectively; these screening intervals would mean women having 50, 25, 16, 10, and 5 smear tests, respectively, in their lifetime (IARC Working Group on Cervical Cancer Screening Programs, 1986). Despite its effectiveness, only 84.5% of females aged 21–65 years were compliant with cervical cancer screening guidelines in 2008 (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016).

In this context, it is clear that the most efficacious and most cost-effective strategy is HPV vaccine prior to the onset of sexual activity (i.e., 11–12 years). As this occurs, the need for (and dollars expended on) Pap smears will decline.

**Characteristics of Individuals at Risk** Several risk factors for cervical cancer have been identified (Chelimo, Wouldes, Cameron, & Elwood, 2013). Though the most important of these is HPV exposure (see discussion above), other risk factors include smoking (see discussion above), dietary factors (see discussion above), body weight (see discussion above), age at first sexual intercourse (Louie et al., 2009; Plummer, Peto, & Franceschi, 2012), immunosuppression (Dugue, Rebolj, Garred, & Lynge, 2016), chlamydia infection (Silva, Cerqueira, & Medeiros, 2014), prenatal exposure to diethylstilbestrol (DES) (Troisi et al., 2016), long-term use of oral contraceptives (Gierisch et al., 2013; La Vecchia & Boccia, 2014), having multiple ( $\geq 3$ ) full-term pregnancies (Muñoz et al., 2002), being younger than 17 at first full-term pregnancy (Louie et al., 2009), and socioeconomic status (Froment, Gomez, Roux, Derouen, & Kidd, 2014; Singh, Azuine, & Siahpush, 2012; Ward et al., 2004).

Furthermore, significant disparities in cervical cancer screening exist by race, ethnicity, geographic location, education, and disability status. Specifically, women are less likely to have received a Pap test within the past 3 years if they are non-White (78%, compared to 82.7% of Whites), have a less than high school educational level (68.5%, compared to 87.5% of individuals with an advanced degree), live in a rural area (77.4%, compared to 81.2% of individuals in a metropolitan area), or have a disability (77.8%, compared to 81.7% of persons without disabilities) (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016).

*Barriers to Prevention* Several studies have examined behavioral predictors of cervical cancer screening for rarely or never-screened women (Hatcher, Studts, Dignan, Turner, & Schoenberg, 2011; Studts, Tarasenko, & Schoenberg, 2013). Factors increasing likelihood of being rarely or never screened included belief that cervical



cancer has symptoms, not having a regular source of medical care, belief that screening tests cause worry, employment status, knowing where to access screening, believing that screening is too expensive, and willingness to get a Pap test if one's physician recommended it (Hatcher, Studts, Dignan, Turner, & Schoenberg, 2011). Education, perceived income inadequacy, health status, and type of health insurance coverage were each associated with at least one perceived barrier (Studts, Tarasenko, & Schoenberg, 2013). To further complicate matters, other research has shown that women have poor recall of their history of cervical cancer screening, both in terms of timing and results (Newell, Girgis, Sanson-Fisher, & Ireland, 2000). Of women who reported being adequately screened, 28% were actually inadequately screened. Further, 11% of patients who reported a normal Pap test actually had abnormal or inadequate results. Thus, knowledge of one's history is an additional barrier to appropriate cervical cancer screening.

*Guidelines for Prevention* The American Cancer Society recommends that cervical cancer screening should begin at age 21 (American Cancer Society, 2015). Screening should occur every 3 years for women 21–29 and every 5 years thereafter. Women should not be screened after age 65. The American Society of Clinical Oncology recommends a slightly different screening pattern: women should be screened every 5 years from age 25 to age 65 (Jeronimo et al., 2016). However, in 2008 only 84.5% of females aged 21–65 years had received cervical cancer screening within the past 3–5 years (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016).

As discussed previously, a large percentage of the U.S. population has not been vaccinated in accordance with current recommendations. Although several national agencies (including the American Cancer Society [ACS], the U.S. Preventative Services Task Force [USPSTF], the American College of Obstetricians and Gynecologists [ACOG], and the Society of Gynecologic Oncology [SCG]) state that vaccination status should not affect cervical cancer screening schedule (Centers for Disease Control and Prevention, 2016), statistical simulation suggests that unvaccinated women may optimally require screening two to three times more frequently than vaccinated women (Accetta et al., 2010; Naber, Matthijsse, Rozemeijer, Penning, & Inge, 2016).

*Behavioral Care: Options and Efficacy* Behavioral interventions may increase uptake of cervical cancer screening. A Cochrane review of such interventions identified 38 trials (Everett et al., 2014). While heterogeneity between trials limited statistical pooling of data, there seems to be substantial support for invitation letters in increasing uptake. There is limited evidence to support the use of educational materials alone (Everett et al., 2014). Furthermore, physician-based strategies, especially manual and computer-generated reminders, appear to be a very effective approach in the implementation of cervical cancer screening (Kupets & Covens, 2001). Kupets and Covens identified the number of reminders needed to intervene for cervical cancer screening; approximately three physicians need to be exposed to a reminder notice before one physician actually orders the appropriate screening

test(s). Thus, authors have suggested that any of these strategies alone may not increase cervical cancer screening to desired rates; rather, multilevel interventions may be necessary (Bastani et al., 2002).

## ***Colorectal Cancer***

*Nature of the Problem* There are two primary methods for screening for colorectal cancer (CRC): fecal occult blood test (FOBT) and colonoscopy. Randomized controlled trials have shown that FOBT can reduce CRC incidence and mortality, and observational studies suggest colonoscopy is effective as well (Walsh & Terdiman, 2003). However, the use of both FOBT and colonoscopy is well below optimal (Meissner, Breen, Klabunde, & Vernon, 2006). Only 52.1% of adults aged 50–75 years received a colorectal cancer screening based on the most recent guidelines in 2008 (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016).

*Characteristics of Individuals at Risk* Individuals are less likely to have been screened for colorectal cancer if they live in a rural area (55.1%, compared to 58.7% of individuals in a metropolitan area) or have a disability (57.3%, compared to 61.8% of persons without disabilities). When recommended, women are more likely than men (59.1% vs. 57.2%) to be compliant with screening (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016).

*Barriers to Prevention* Multiple behavioral barriers to screening exist, of which some are remediable (Weitzman, Zapka, Estabrook, & Goins, 2001). Knowledge about colorectal cancer is low, and misperceptions are common (Weitzman, Zapka, Estabrook, & Goins, 2001). For example, two consistent barriers to screening are the beliefs that (a) the test is not needed and (b) the test is embarrassing. (Janz, Wren, Schottenfeld, & Guire, 2003). Furthermore, the psychosocial factor that has been identified as one of the strongest predictors of adherence across studies is knowledge of family history of colorectal cancer (Gili, Roca, Ferrer, Obrador, & Cabeza, 2006; Vernon, 1997). One study compared “users,” “attempters,” and non-users of colorectal cancer screening (Janz et al., 2007). The importance of psychological decisional factors (e.g., discomfort, concern about complications, anxiety, embarrassment, fear of results) differed significantly by screening status, such that more non-users and attempters reported psychological decisional factors as important compared to users. Among factors interfering with test completion, 38.5% attempting FOBT reported they “forgot” whereas 29.8% attempting colonoscopy were “afraid of pain” (Janz et al., 2007). Finally, preparation for (24-h intake restriction, consumption of bowel pre-liquid) and the time commitment (24 h for preparation, test, and recovery) of screening poses scheduling difficulties and

financial drawbacks (e.g., lost wages) for many (Kiviniemi, Bennett, Zaiter, & Marshall, 2011).

*Guidelines for Prevention* The American Cancer Society currently recommends either fecal occult blood testing (FOBT) every year or colonoscopy every 10 years for all average risk individuals aged 50 years or older (American Cancer Society, 2015). At present, the available evidence does not currently support choosing one test over another. In 2008, only 52.1% of adults aged 50–75 years had received either type of recommended colorectal cancer screening (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2016). The U.S. Department of Health and Human Services has set the goal of increasing this number to 70.5% by the year 2020.

*Behavioral Care: Options and Efficacy* Several effective interventions to promote CRC screening have been identified (Rawl, Menon, Burness, & Breslau, 2012). Morrow, Dallo, and Julka (2010) found that interventions to increase CRC screening had the most robust effects compared to controls when they included patient mailings and/or telephone outreach components. Such interventions were hypothesized to increase awareness among individuals eligible for CRC screening. Holden, Jonas, Porterfield, Reuland, and Harris (2010) and Sabatino et al. (2012) found similar effects for interventions that included patient reminders. Furthermore, there is strong effectiveness evidence for interventions including individual communications to patients by clinic staff, elimination of structural barriers (e.g., simplifying access to FOBT cards, providing FOBT tests and instructions for home use), or system-level changes (e.g., systematic rather than opportunistic screening) (Holden, Jonas, Porterfield, Reuland, & Harris, 2010). As discussed in regards to breast and cervical cancer screening, multifactor interventions that target more than one level of the CRC screening process are likely to have larger effects (Power et al., 2009).

More recently, it has been suggested that the evidence base for improving CRC screening supports a new model of primary care delivery (Klabunde et al., 2007). With it, primary care practices implementing effective systems and procedures for screening are key for improving screening rates. Active engagement and support of practices (i.e., using a team approach, establishment of information systems, increasing patient involvement, changing reimbursement policies, etc.) are essential for the potential of colorectal cancer screening to be realized (Klabunde et al., 2007).

## Tertiary Prevention

Tertiary prevention aims to reduce morbidity and minimize the impact of a disease among already-affected individuals. The goal is to reduce or delay disease-related complications, reduce stress, and achieve mental, physical, and social recovery. To

do so, research shows biobehavioral interventions can improve tertiary care and reduce disease burden.

## ***Stress***

There is enormous stress and quality of life disruption with a cancer diagnosis and treatment. It promotes a cascade of negative sequelae—some biologic, others behavioral—which have their own negative consequences (Andersen, Kiecolt-Glaser, & Glaser, 1994; Golden-Kreutz et al., 2005) and impact the “whole cancer patient” (Adler, Page, & National Institute of Medicine (U.S.). Committee on Psychosocial Services to Cancer Patients/Families in a Community Setting, 2008). If left untreated, stress occurring at the time of cancer diagnosis contributes to lower quality of life, increased depressive and anxiety symptoms, increased adverse effects, and more physical symptoms. In fact, stress and stress-related biologic alterations can elicit symptoms but also “generate” depressive or anxiety disorders (Wu & Andersen, 2010).

CBT has been used for problems such as insomnia and fatigue, and interestingly, depression and anxiety symptoms often improve. For example, CBT for insomnia (CBT-I) (Dirksen & Epstein, 2008; Espie et al., 2008; Fiorentino et al., 2010; Garland et al., 2014; Savard, Simard, Ivers, & Morin, 2005) uses cognitive strategies, education and provision of sleep hygiene information, relaxation training, stimulus control, and sleep restriction. Improvements in subjective (Espie et al., 2008; Fiorentino et al., 2010) and objective (Espie et al., 2008; Fiorentino et al., 2010; Garland et al., 2014) sleep indices, lower frequency of medicated nights (Fiorentino et al., 2010; Savard et al., 2005), and better sleep quality (Fiorentino et al., 2010; Garland et al., 2014) have been reported along with significant reductions in anxiety (Dirksen & Epstein, 2008; Savard et al., 2005) and depressive symptoms (Dirksen & Epstein, 2008; Savard et al., 2005), as well as improvements in mood (Garland et al., 2014) have been found post-treatment. Similarly, CBT for fatigue (Kangas, Bovbjerg, & Montgomery, 2008) uses cognitive restructuring for negative beliefs about fatigue and behavioral strategies such as activity scheduling or increasing exercise. Patients report improvements in fatigue (Gielissen, Verhagen, & Bleijenberg, 2007; Kangas, Bovbjerg, & Montgomery, 2008; Lee, Lim, Yoo, & Kim, 2011; Montgomery et al., 2014), quality of life (Lee, Lim, Yoo, & Kim, 2011), and psychological distress (Gielissen, Verhagen, & Bleijenberg, 2007).

## ***Psychopathology***

*Nature of the Problem* Psychiatric disorders are more prevalent among cancer patients than among those with any other chronic illness (Evans et al., 2005). Though studies vary, the point prevalence estimates are 38.2% for any mood

disorder, 20.7% for all types of depression, 10.3% for anxiety disorders, and 19.4% for any adjustment disorder (Mitchell et al., 2011). By comparison, the World Health Organization World Mental Health reports 12-month prevalence estimates for the U.S. as 9.7% for mood disorders and 19.0% for anxiety disorders (Kessler et al., 2009). Among cancer patients, major depressive disorder (MDD) is the most common psychiatric disorder, with prevalence rates ranging from 10% to 50% (Croyle & Rowland, 2003; Fann et al., 2008; Massie, Gagnon, & Holland, 1994). Anxiety is also common, with prevalence rates ranging from 25% to 48% (Brintzenhofe-Szoc et al., 2009; Burgess et al., 2005; Stark et al., 2002). As is the case for those without concurrent physical illness, depression and anxiety often co-occur among cancer patients. Stark et al. (2002) found that 38% of cancer patients with an anxiety disorder also have MDD.

Tertiary prevention for cancer patients with comorbid psychiatric disorders is imperative, particularly in the case of depression. Functional impairment accompanying major depressive disorder (MDD) is significant and includes poorer physical health, more pain, increased anxiety, substance use, and low quality of life in the areas of relationships, self-care, physical activities, sexual functioning, and sleep, among others (Burgess et al., 2005; Chida, Hamer, Wardle, & Steptoe, 2008; Ciaramella & Poli, 2001; Evans et al., 2005; Fortner, Stepanski, Wang, Kasproicz, & Durrence, 2002; Lev et al., 2001; Lundberg & Passik, 1997; Williamson, 2000). Economic issues also are consequential in that cancer patients with depression spend more time with physicians, have more frequent hospital and primary care visits, and have higher healthcare costs (Carlson & Bultz, 2004; Chirikos, Mph, & Jacobsen, 2008; Hewitt & Rowland, 2002). In general, depression is a risk factor for premature mortality (RR = 1.22–1.39) (Kang et al., 2009; Mozaffari et al., 2009), but this is particularly true for cancer patients (Chida, Hamer, Wardle, & Steptoe, 2008). For breast cancer patients, for example, both cancer death (RR = 1.18) (Kang et al., 2009) and all-cause death rates (RR = 1.31) (Standish et al., 2008) are elevated; conversely, a decrease in depressive symptoms is associated with longer survival (Wiltshcke et al., 1995).

*Characteristics of Individuals at Risk* Risk factors for psychiatric disorders include familial history (positive), gender (female), partner/marital status (alone), low socioeconomic status (SES), and others, such as a pre-cancer history of mood and anxiety disorders (Breitbart, 1995; Morasso et al., 2001) (see Table 14.1). Additionally, data show that high levels of stress and/or depressive symptoms at diagnosis/treatment are long-term limiting factors and place individuals at risk for future symptoms (Andersen, Goyal, Westbrook, Bishop, & Carson, 2017). Even when early symptoms decline, patients may experience no further improvement in stress and/or return to earlier, higher depressive symptom levels. These patterns underscore the importance of tertiary prevention and the recommendation to screen patients at the time of diagnosis for symptoms of depression and anxiety (Andersen et al., 2014). The data also show that the absolute levels of symptoms at diagnosis/treatment best predict risk. Thus, patients with higher stress levels are in need of early, evidence-based, psychological treatment not only to lower current stress but

to prevent its maintenance and the poorer quality of life which follows (Andersen et al., 2004, 2008, 2010).

*Barriers* While it is known that both depression and anxiety are prevalent among cancer patients, discussions about psychosocial difficulties and referral to psychosocial services often do not occur. It is estimated that 7.6 million cancer survivors in the U.S. have not discussed their psychosocial functioning with healthcare providers (Forsythe et al., 2013) in spite of Institute of Medicine (IOM) recommendations for providers to have such discussions. Studies suggest that patients are aware of their need to deal with emotional problems, want their medical team to ask and offer emotional help (Miller, Pittman, & Strong, 2003), and have generally positive views of psychosocial services (Owen, Goldstein, Lee, Breen, & Rowland, 2007). However, except for the most obvious symptoms such as suicidal ideation (Oquendo et al., 2004), diagnostic criteria for depression and other disorders may not be known by a medical team (Fallowfield, Ratcliffe, Jenkins, & Saul, 2001), symptoms may be trivialized as a “normal” reaction or interpreted as due only to impaired physical status (Evans et al., 2005). Studies show that even when significant symptoms are detected, their severity is underestimated or undertreated (Keller et al., 2000, 2004; McDonald et al., 1999; Newell, Sanson-Fisher, Girgis, & Bonaventura, 1998; Singer et al., 2011). In addition to lack of symptom relief, the absence of treatment brings further sequelae (Fann et al., 2008)—more symptom distress (Mystakidou et al., 2005; Sadler et al., 2002; Smith, Gomm, & Dickens, 2003), less meaning in life (Carver & Antoni, 2004; Simonelli, Fowler, Maxwell, & Andersen, 2008), less social support (Parker, Baile, de Moor, & Cohen, 2003; Schroevers, Ranchor, & Sanderman, 2003), maladaptive coping (Carver et al., 1993), and employment absenteeism (Shelby, Golden-Kreutz, & Andersen, 2008), among others. Treatments can successfully address these problems (Faller et al., 2013; Stanton, 2006) and has the potential to reduce the risk of recurrence (Andersen et al., 2008) or cancer death (Andersen et al., 2010; Giese-Davis et al., 2011; Hjerl et al., 2003; Pinquart & Duberstein, 2010). Unfortunately, evidence-based treatments (EBTs) are underutilized in clinical practice as dissemination of EBTs has been extremely slow and training opportunities for providers scarce. This is in spite of the hundreds of RCTs (Andersen, 1992, 2002; Osborn, Demoncada, & Feuerstein, 2006) that have tested psychosocial treatments and found them efficacious for cancer patients.

*Guidelines* Two national forces provide impetus for recognition of psychopathology and provision of treatment. In 2012 the Commission on Cancer of the American College of Surgeons (CoC) defined stringent new patient-centered quality standards for accreditation of 1500+ cancer clinics and hospitals. According to Standard 3.2, all cancer clinics must provide psychosocial services to cancer patients and document the efficacy of doing so. The second is the American Society of Clinical Oncology (ASCO) guidelines (Andersen et al., 2014), specifying that all patients be evaluated for symptoms of depression (Kroenke, Spitzer, & Williams, 2001) and

anxiety (Spitzer, Kroenke, Williams, & Löwe, 2006) at periodic times across the trajectory of care. In Table 14.1 the guidelines are summarized. Assessment should be performed using validated, published measures and procedures. Depending on levels of symptoms and supplementary information, differing treatment pathways are recommended: “Psychological and psychosocial interventions should derive from relevant treatment manuals for empirically supported treatments specifying the content and guiding the structure, delivery mode, and duration of the intervention.” Taken together, CoC specifies the necessity and ASCO specifies the means for cancer centers—large and small and urban and rural—to assess and provide treatment when indicated.

*Behavioral Care: Options and Efficacy* Efficacious treatments exist for moderate to severe symptoms (Cuijpers et al., 2014; Delgado & Zarkowski, 2004; Rapaport et al., 2006). Among psychotherapies, cognitive behavioral therapy (CBT) (Butler, Chapman, Forman, & Beck, 2006; Dimidjian et al., 2006) is the treatment of choice and is an effective treatment for both mood and anxiety disorders (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012). CBT is more effective than control conditions (Beltman, Oude Voshaar, & Speckens, 2010; Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012; van Straten, Geraedts, Verdonck-de Leeuw, Andersson, & Cuijpers, 2010) and in RCTs, as effective as antidepressant medication (ADM) (Strunk & DeRubeis, 2001). Even among the severely depressed, Hollon et al. (2005) found that both CBT and ADM produced comparable results (about 58% treatment responders) during the acute phase, but when discontinued, patients treated with CBT were at lower risk for relapse for upward of 2 years than those treated with ADM.

CBT for depression has three components (Beck, Rush, Shaw, & Emery, 1979). *Behavioral activation* involves efforts to increase patients’ engagement in activities and contexts that may allow them to experience pleasure or a sense of accomplishment; behavioral activation is also done to promote cognitive change (Jacobson, Martell, & Dimidjian, 2001). Secondly, *correcting negative automatic thoughts* is a collaborative process when therapist and client work together to identify and evaluate depressive thinking accompanying patients’ negative mood states. Once patients have mastered these and other basic skills (e.g., problem solving, assertive communication), therapists assist clients to *identify and change core beliefs and schemas*, which, more generally, underlie a depressed patient’s pervasive, negative beliefs. Research suggests that all three components are important, although some studies show that behavioral therapy, such as behavioral activation, is sufficient (Dimidjian et al., 2006).



**Table 14.1** American Society of Clinical Oncology recommendations for screening, assessment, and treatment in the management of symptoms of depression and anxiety in adults with cancer

| <b>Screening, assessment, and treatment: Depression in adults with cancer</b>                    |   |   |
|--|---|---|
| Level of symptomatology determined by the PHQ-9 <sup>a</sup>                                     | Further assessment  | Treatment   |
| None/mild<br>Score 1–7   |   | Offer referral to supportive care services  |
| Moderate<br>Score 8–14<br>or<br>Moderate to severe<br>Score 15–19<br>or<br>Severe<br>Score 20–27 | Identify pertinent history/<br>specific risk factors for<br>depression:<br>Family history<br>Prior depressive disorder<br>Psychiatric history<br>Disease severity<br>Gender<br>Partner status<br>Presence of other chronic<br>illness<br>Employment/SES | Moderate: low-intensity<br>intervention options include<br>Individually guided self-help<br>based on CBT<br>Group-based CBT for<br>depression<br>Group-based psychosocial<br>interventions<br>Structured physical activity<br>program<br>Pharmacologic intervention,<br>as appropriate<br><br>Moderate to severe: high-<br>intensity intervention options<br>include<br>Individual psychotherapy<br>(CBT, interpersonal therapy)<br>Pharmacologic intervention<br>Combination of<br>psychotherapy and<br>pharmacologic intervention |
| <b>Screening, assessment, and treatment: Anxiety in adults with cancer</b>                       |   |   |
| Level of symptomatology determined by the GAD-7 <sup>b</sup>                                     | Further assessment  | Treatment   |
| None/mild<br>Score 0–4, 5–9  |   | Offer referral to supportive care services  |
| Moderate<br>Score 10–14<br>or<br>Moderate to severe<br>Score 15–21                               | Identify pertinent history/<br>specific risk factors for<br>(generalized) anxiety:<br>Family history<br>Psychiatric history<br>History/presence of alcohol<br>or substance abuse<br>Presence of other chronic<br>illness                                | Moderate: low-intensity<br>intervention options include<br>Education and active<br>monitoring<br>Non-facilitated or guided<br>self-help based on CBT<br>Group psychosocial<br>intervention<br>Pharmacologic intervention,<br>as appropriate<br><br>Moderate to severe: high-<br>intensity intervention options<br>include<br>Individual psychotherapy<br>(CBT, applied relaxation)<br>Pharmacologic intervention<br>Combination of<br>psychotherapy and<br>pharmacologic intervention   |

<sup>a</sup>PHQ-9 Patient Health Questionnaire Nine-Symptom Depression Scale (Kroenke et al., 2001)

<sup>b</sup>GAD-7 Generalized Anxiety Disorder 7-item (Spitzer et al., 2006)

## ***An Example: CBT for Cancer Patients with Mood and Anxiety Disorders***

A number of meta-analyses have examined the efficacy of psychotherapy for depressed breast cancer patients and generally report moderate effectiveness in reducing symptoms of depression, anxiety, and pain (Fann et al., 2008; Lepore & Coyne, 2006; Newell, Sanson-Fisher, & Savolainen, 2002; Sheard & Maguire, 1999; Williams & Dale, 2006). However, the majority of outcome studies for both depression and anxiety have been criticized as using subsyndromal and unsystematically diagnosed samples (Hopko, Colman, & Carvalho, 2008; Newell, Sanson-Fisher, & Savolainen, 2002; Osborn, Demoncada, & Feuerstein, 2006; Sheard & Maguire, 1999). We provide two exceptions below. These two examples are unique in adapting cognitive behavioral therapy for patients with comorbid MDD.

*Cognitive Behavioral Therapy for Cancer Patients* (Brothers, Yang, Strunk, & Andersen, 2011). Brothers, Yang, Strunk, and Andersen (2011) combined elements of the biobehavioral intervention (BBI; Andersen, 2002; Andersen et al., 2004) for cancer patients with the core strategies of CBT for depression with cancer survivors ( $N = 36$ ) diagnosed with MDD in a single-arm study. CBT components were, namely, behavioral activation (daily activity/symptom log, activity scheduling, review of successes/obstacles), cognitive reappraisal (thought records, generating alternative thoughts, maintenance), and efficacious components of biobehavioral treatment (progressive muscle relaxation, social support, and assertive communication). A 12–16 session treatment was developed and tested with a mixed gender and mixed disease site and stage (I–IV; recurrence) sample, all meeting criteria for MDD. As is common for those with depression, 53% of the sample had a comorbid anxiety disorder (e.g., generalized anxiety disorder) and 50% had a prior depressive episode. Results showed significant improvement in depressive symptoms as measured by both the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) and the clinician-rated Hamilton Rating Scale for Depression (HRSD; Williams, 1988), fatigue, and quality of life. Clinically significant reductions occurred for 61% of the patients using the BDI-II criterion and 69% using the HRSD criterion. Importantly, 90% of the treatment completers met criteria for depression remission.

*Brief Behavioral Activation Treatment for Depression (BATD; Lejuez, Hopko, LePage, Hopko, & McNeil, 2001)*. Hopko et al. (2008) conducted a RCT comparing behavioral activation component of CBT with problem solving with breast cancer patients ( $N = 80$ ) with diagnosed with MDD using the Anxiety Disorders Interview Schedule-IV (ADIS-IV; Brown, DiNardo, & Barlow, 1994). In BATD, behavioral activation uses structured attempts at engendering increases in overt behaviors that are likely to bring patients into contact with reinforcing environmental contingencies and produce corresponding improvements in thoughts, mood, and overall quality of life (Hopko, Lejuez, Ruggiero, & Eifert, 2003). Initial sessions involved assessing the function of depressed behavior, establishing patient rapport, motivational exercises focused on behavioral change, depression psychoeducation,

understanding the relationship between depression and breast cancer, and discussion of the treatment rationale. Subsequent sessions focused on systematically increasing activities with reinforcing environmental contingencies—a necessary precursor toward the reduction of overt and covert depressed behavior. BATD was compared to problem-solving therapy (PST). Problem-solving therapy largely is based on research suggesting that a range of life events or problems have a strong association with psychological well-being (Nezu, 1987). It is designed to attenuate depressive symptoms by assisting patients in generating and developing skills that alleviate life events or problems that interfere with psychosocial functioning (Hegel, Barrett, & Oxman, 2000). Overall, both treatments resulted in improvement across all outcome measures, including self-reported depression (BDI-II), clinician-rated depression (HRSD), somatic anxiety, bodily pain, quality of life, and social functioning. Treatment gains were maintained at the 12-month follow-up, with those in the BATD arm having more post-treatment improvements than those in the PST arm. Follow-up analyses (Hopko et al., 2013) found that both treatments significantly decreased suicidal ideation and increased hopefulness at post-treatment, and this too was maintained at the 12-month follow-up. Based on response (50% reduction in baseline symptoms) and remission criteria (BDI-II < 10), 75% of patients exhibited clinically significant reductions in depression.

These studies provide two different successful demonstrations of CBT for cancer patients with MDD. They suggest that CBT, with or without all of the standard components, is effective for MDD and can be tailored to the unique needs of individuals with a comorbid cancer diagnosis.

## **Concluding Remarks: Integration of Behavioral Scientists into Primary and Secondary Prevention and Tertiary Cancer Care**

The role of the behavioral scientist (psychologist) differs considerably across the levels of cancer prevention reviewed here. For primary prevention, the majority of the efforts occur in public health or community health venues, with fewer in primary care and the fewest within oncology settings. In secondary prevention, cancer screening uptake and follow-up occurs largely in primary care settings. The work of tertiary prevention described above has occurred thus far primarily in large regional centers (i.e., Veterans Affairs hospitals (VAH), comprehensive cancer centers) with little work having come from community facilities or practices. Unlike other chronic illnesses, such as diabetes or cardiovascular disease, current management for oncology patients is remaining in specialty oncology centers or practices with the shift to primary care, even for long-time survivors, occurring very slowly. Thus, behavioral scientists in oncology will contribute in different ways, driven by the level of prevention within which they are focused. Specifically, those in primary prevention will be within public health and system change venues. As such, training, level of

integration, barriers to integration, financial considerations, and policy for behavioral scientists are largely level dependent. For this discussion, focus is on behavioral scientists in secondary and tertiary prevention as their roles may have the greatest overlap.

In the literature reviewed, the contributions of behavioral scientists have been within three contexts (Fisher & Dickinson, 2014). First, there is the traditional role of provider to individual patients. This might also include selective consultations with MDs, for example, or meeting with family members. These psychologists often regard themselves as mental health providers rather than health providers. This type of service delivery is the most vulnerable to future continuance, due to its (expensive) requirement of professional time, difficulty with reimbursement (see below), and limited patient access (Kazdin, 2008). A second role for behavioral scientists—and the one in which the greatest contribution have been made—is to develop, apply, and make operational behavioral/psychological assessments and develop, validate, and deliver evidence-based, secondary and tertiary prevention programs or treatments. The third key role has been for behavioral scientists to develop behavioral care for high-risk patient groups. Related to this could be assisting in care coordination, particularly for patients with behavioral issues who may also be high users of health services. However, behavioral scientists in oncology have not taken the lead in this latter area despite their expertise to do so. There are other roles for behavioral scientists (e.g., clinical consultation to the staff, working to improve the organization's functioning in the areas of patient flow, staffing, etc.; Fisher & Dickinson, 2014), but examples of such in oncology are not obvious.

## *Training*

Currently there is no training paradigm that integrates behavioral science and cancer. Perhaps more serious is that psychology's current training programs are not producing sufficient numbers of psychologists trained in patient-centered integrated care in general or that in oncology specifically (Weil et al., 2015). As has been suggested, psychologists need to be competent in integrating psychological services into healthcare settings and practice (Johnson, 2013; Johnson & Marrero, 2016). Training in oncology is limited at both the pre- and postdoctoral levels, with predoctoral training limited to the few graduate programs, primarily in clinical psychology, that have oncology researchers within specialty training in behavioral medicine (e.g., University of Miami) or health psychology (e.g., Ohio State University, University of California—Los Angeles). The extent to which this training provides a readiness for entry into integrated care within internal medicine or oncology environments is variable. Minimum training requirements might include the following: (a) a rigorous "Cancer 101" understanding, e.g., epidemiology, behavioral responses and trajectories, cancer treatments, etc.; (b) familiarity with the behavioral oncology knowledge base, particularly that for empirically supported interventions, and an awareness of oncology-relevant behavioral guidelines; (c) awareness that primary

care and oncology settings are ones of high volume where time-focused, circumscribed interventions are normative; and (d) clinical opportunities in which psychology trainees are a part of multidisciplinary primary healthcare teams.

At the postdoctoral level, there have been NIH F32 (National Research Service Award (NRSA) for individual postdoctoral fellows), F99/100 (pathway to independence), or K07 (career independent) awards; however, these are primarily focused on research (rather than clinical) development, training, and mentorship. However, VAH postdoctoral positions often have substantial (e.g.,  $\geq 50\%$ ) time dedicated to clinical training and service provision.

### *Expertise and Role of the Psychologist*

Many health system administrators and medical professionals are unaware of what psychologists have to offer (Johnson & Marrero, 2016). Thus, it seems reasonable to ask, “What does the psychologist bring to oncology integrated medical care?” There are three key, unique domains of accomplishment and expertise. They are considered in the context of Raghavan, Bright, and Shadoin’s (2008) model showing “patient encounter” in a center circle surrounded by larger, concentric ones of organization, agency, and social policy contributions.

The first key skill is the ability of the behavioral scientist to conceptualize the person, i.e., human behavior and psychological processes, and the environment. This skill is most obvious in providers of behavioral services to the individual, but the skills are generalizable to group and systems. This enables the behavioral scientist to contribute substantively to “macro” assessment, evaluation, and decision-making in departments, larger units, systems of care, and policy. The second key skill is expertise in conceptualizing the assessment of health behaviors and psychological processes. A foundation of clinical psychology is expertise in assessment, be it individuals, groups, or environments. Again, the obvious exemplar is assessment of behavior, cognitions, and psychological responses of the individual patient, but the foundational training of the scientist in assessment, psychometrics, research design, and statistics can be the guideposts for determining patient-reported outcomes, system outcomes, or data for policy decision-making. The third key skill is that to develop, evaluate, and, for some, provide empirically supported behavioral and psychological care. These key areas are made even more contributory by the expertise of behavioral scientists to conceptualize, research, analyze, and interpret data to develop and enhance behavioral healthcare.

## *Financial Issues in Service Delivery*

At present, behavioral healthcare and general physical care are usually supported by different health insurance funding mechanisms, with the former being an insurance “carve out” within general health insurance coverage for the latter. Each has different restrictions on frequency and type of service offered with the fee model being charges for individual visits or “procedures.” This is a service model rewarding providers for the volume of services, per se, with no linkage to quality of care. This has been seen as one of the most important external challenges to achieving high-quality patient-centered integrated care. As U.S. healthcare is not a single-payer system but one of thousands, changing the payment model is a major challenge. There are newer models (Kathol, Butler, McAlpine, & Kane, 2010; O’Donnell, Williams, & Kilbourne, 2013) such as the Medicare Payment Advisory Commission (MedPAC) endorsement of “bundled” payments, i.e., managing a patient with cancer is achieved by a set fee, a “bundled payment,” for all the services of the healthcare team of which a behavioral scientist might be a part. Another approach might include pay-for-performance or gain-sharing arrangements that are designed to reward providers for efficiently delivering appropriate care (Korda & Eldridge, 2011). Suffice it to say, these issues are evolving; a more complete discussion of these complex issues can be found in Kessler (this volume).

## **Concluding Remarks**

Behavioral scientists must advocate for the integration of behavioral health into cancer prevention and control. Prior accomplishments, particularly those relevant to the delivery of empirically supported treatments, may have little value added, however, unless there is a translation from the research environments of their development and testing to the diversity of clinical settings in oncology where they are needed. Addressing this longstanding gap (“implementation cliff”) is complex (Backer, David, & Soucy, 1995; Barlow & McHugh, 2012). There are recent efforts in oncology to conceptualize this problem (Andersen & Dorfman, 2016) and train (Brothers et al., 2015) and support community providers to achieve EBT usage (Ryba, Brothers, & Andersen, 2017). Ultimately, the challenges in the dissemination and implementation of cancer prevention and control behavioral measures are two (Herschell, Kolko, Baumann, & Davis, 2010): (1) Can psychologists in the community be trained and become knowledgeable and skillful in new prevention and control treatment implementations? And (2) how do behavioral scientists’ usage of new knowledge/skills improve outcomes for oncology patients? Behavioral scientists have the skills to meet these two challenges.

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