Chapter 14

Health Care System Approaches to Obesity Prevention and Control

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Introduction

A health care system may be one of those things that we know when we see, but have a hard time defining. Challenges in defining the scope of the health care system have long been noted (Rodwin, 1990). It has been suggested by some that such systems encompass all societal activities designed to protect or restore health; others have suggested a more limited definition, related expressly to medical care but interacting with heredity, lifestyle and environmental influences.

Defined narrowly or broadly, the health care system represents an array of resources and activities with considerable potential to influence health-related behavioral patterns and outcomes over time. This is of course germane to the challenge of obesity prevention and control, which is ultimately a matter of dietary and activity patterns over the course of a lifetime. The role of the health care system in weight management has obvious implications for other conditions, including the most prevalent chronic diseases in our society – cardiovascular diseases, diabetes mellitus, cancer, arthritis – which represents an incomplete list of the potential metabolic sequelae of obesity.

Obesity and overweight are among the most common conditions seen in adult primary care, and are increasingly prevalent in pediatric and adolescent patients (Hedley *et al.*, 2004; M. Noel *et al.*, 1998a; O'Brien *et al.*, 2004; Ogden *et al.*, 2006). The number of children in the United States who are overweight has tripled over the last two decades. Also, despite a conservative definition of overweight, at least 15% (over 9 million) of children aged 6–19 years are considered overweight (Grundy, 2000; Hassink, 2003; Richard, 2003). Independent of any other considerations, the epidemiology of obesity makes weight management efforts by the health care system a priority.

Health care efforts directed toward weight management (implying both obesity prevention and control) should be universal and anticipatory, meaning prevention-oriented. While there is certainly a place in obesity management for various specialists (e.g., endocrinologists, cardiologists, etc.), obesity prevention is largely a task for primary care providers, including the disciplines of pediatrics, family practice, obstetrics and gynecology, and internal medicine

(Cifuentes *et al.*, 2005; Leermakers *et al.*, 1998; P. D. Martin *et al.*, 2003; McCallum & Gerner, 2005; O'Brien et al., 2004; Olson *et al.*, 2004; Polley *et al.*, 2002; Scott *et al.*, 2004).

While there is little direct evidence for the efficacy of obesity-prevention counseling, or for counseling to foster sustained weight loss, (U.S. Preventive Services Task Force, 2003b) the rationale for such counseling is strong on theoretical grounds. Weight control is contingent upon the quality and quantity of dietary intake (calories in), and the pattern of physical activity (calories out). Both these factors – prudent dietary choices and regular physical activity – are also important to health (Fulton *et al.*, 2004; D. L. Katz, 2001b; Wahlqvist, 2005). Thus, weight control counseling is, in essence, counseling to encourage healthful lifestyle practices. The fact that counseling directed toward improvement in diet (U.S. Preventive Services Task Force, 2003a) and physical activity (U.S. Preventive Services Task Force, 2002) patterns is as yet of unproved effectiveness is an invitation to improve the delivery and evaluation of such counseling, rather than a reason to abandon it.

Such considerations make attention to weight management in the health care system setting a question of "how" rather than of "whether." But the "how" is a challenging and perhaps even daunting question. Understanding how to enhance, revise, expand, extend or coordinate the complex components of the health care system so that weight management is consistently fostered at an acceptable cost is inchoate at best. The health care system offers enormous potential contributions to obesity prevention and control efforts, but is encumbered by obstacles to many of the most promising applications. This chapter is devoted to a consideration of the obstacles to, and opportunities for, obesity prevention and control in the health care system. A case is made for cautious optimism.

Components of the Health Care System

There is no single, definitive source to characterize a comprehensive inventory of health care system components, as they relate to weight control or any other condition. The Healthcare Systems Bureau of the *Health Resources and Services Administration* of the U.S. Government encompasses programs related to health care access for the underserved; organ donation; emergency preparedness; and vaccine injury compensation (Health Resources and Services Administration). Rather than establishing the bounds of the health care system, this programmatic cluster seems to highlight that the term is open to interpretation. Therefore, the inventory of health care system components included in **Table 14.1**, which also suggests how each component might contribute to obesity prevention and control, should be considered illustrative rather than definitive.

Obesity Prevention and Management in the U.S. Health Care System: Obstacles and Opportunities

Current efforts to promote adoption and institutionalization of obesity prevention and management are fragmented and disparate at best. A considerable gap exists between what we think optimal obesity prevention and control efforts

Table 14.1 Discrete components of the health care system with potential application to obesity prevention and control. (Note: *Components are categorized into micro, meso, and macro domains with micro relating to the patient/provider encounter; meso relating to health care service delivery in general; and macro relating to the situation of health care services within a societal context.*[*])

Micro Level

Component	Application
Patient	The attitudes, beliefs, knowledge and capacities the patient brings into the health care setting (e.g., health literacy) influence the productivity of the encounter. Obesity control could be pursued through efforts to enhance patient self-efficacy prior to accessing the health care system.
Provider	Traditionally, efforts to enhance the provision of clinical services have focused on enhancing the knowledge, proficiency, and performance of providers. In the case of obesity prevention and control, this entails enhancing the capacity of the provider to deliver effective counseling. Improving provider personal self efficacy for a healthy lifestyle translates into increased rates of counseling (Crawford *et al.*, 2004)
Non-clinical support staff (i.e., administrative and clerical staff)	To the extent time pressures limit the interaction between patient and provider, practice staff in the health care setting may compensate by contributing to information exchange and monitoring. Obesity prevention and control could be advanced by increasing the contributions of support staff to patient self-efficacy.
Human interactions/ relationships	Obesity is a stigmatizing condition, and thus a sensitive topic of discussion. Specific efforts to improve provider/patient relationships so that the topic is addressed comfortably and productively could enhance control efforts.

Meso Level – Organizational

Component	Application
Infrastructure/facilities	Everything from the availability and placement of scales and other devices for assessing weight/adiposity to the space available for encounters, may contribute to the productivity of encounters pertaining to weight management.
Medical technology & resources (diagnostic, therapeutic)	The availability and use of technology for the assessment of anthropometrics; pharmacy services; and even surgical services all potentially contribute to obesity prevention and control.
Networking capacity/ coordination	Improvements in referral patterns to dietitians, physical therapists/trainers, and/or specialists could enhance the efficacy of weight control efforts. Expansion of the provision of weight control guidance into more clinical encounters, such as dental encounters, could contribute to the reinforcement of key messages.
Repeated communication	Enhancements in longitudinal reinforcement of messages delivered during clinical encounters by use of telephone, Internet, or print materials have the potential to enhance the effectiveness of obesity prevention and control efforts.

(*Continued*)

Table 14.1 (Continued)

Meso Level – Organizational	
Component	**Application**
Information technology	Provider access to state-of-the-art weight control guidance during and between encounters, and patient access to analogous lay materials, could enhance the quality and efficiency of clinical weight control efforts.
Patient flow management/logistics	Innovations in patient management, such as group encounters to extend contact time with providers, could be used to enhance obesity control efforts.
Meso Level – Community	
Component	**Application**
Outreach activities	Clinical sites can engage in efforts to attract patients for services related to weight management (e.g., seminars), and can attempt to influence non-clinical resources in the community (e.g., schools, restaurants).
Inreach activities	Coordinated community efforts for weight control may encompass efforts by non-clinical entities to obtain support and information from the health care system. The availability of resources from health care to enhance information exchange or services in schools or worksites could contribute to obesity prevention and control.
Macro Level – Policy	
Component	**Application**
Financing	Changes in reimbursement mechanisms can alter clinical priorities and could be used to encourage greater clinical attention to weight control.
Accountability/regulation	Various approaches to the monitoring and regulation of weight control activities in the clinical setting may reinforce commitment to them. These include pay-for-performance; monitoring of pertinent HEDIS measures; documentation of BMI and risk assessment for overweight and obesity; direct incentives/disincentives to patients; etc.

*Based on the classification scheme outlined in WHO (World Health Organization, 2001). The content of the table is otherwise original.

§ Health Plan Employer Data and Information Set (HEDIS) (Corrigan & Nielsen, 1993)

should look like and actual patterns of care. Indeed, much of the discussion of weight management has focused on the growing realization of the distance between normative standards of care and actual practice. While the list of obstacles to effective weight management in primary care can appear daunting, each obstacle represents a potential opportunity to intervene in distinct components of the health care system elucidated in Table 14.1. As noted below, neither the components of the health care system, nor the application of each to the goal of weight management, is truly independent of the entire system.

Efforts to enhance the receptiveness of patients to provider counseling are dependent partly on the nature of that counseling; the effectiveness of providers requires active participation by the patient, and by payers. Nonetheless, a delineation of system components is a useful framework for

illustration of both obstacles and opportunities, along the way toward resynthesizing those elements back into a better-functioning whole.

The health care setting offers nearly universal, if episodic, access to the population. Approximately 40 million Americans are hospitalized at least once each year (Agency for Healthcare Research and Quality, 2002). More than 70% of the U.S. population visits a health care provider in any given year for a check up (Center for Disease Control and Prevention, 2004). When visits for all reasons are considered, the health care setting provides annual access to nearly the entire population; this access alone constitutes an important reason why weight control efforts in this setting should be a priority.

Patient

The patient is an important element in the functioning of the health care system. With regard to addressing weight management effectively, the ideal patient would present to a clinical encounter with a good working knowledge of determinants of weight control; knowledge of and interest in both physical activity and healthful diet; motivation to engage in these behaviors, and the resources to incorporate these into daily life. Further, an ideal patient would be receptive to provider advice about lifestyle, and would readily understand such advice whether spoken or in print.

The reality is often quite discrepant from this ideal, however. Knowledge of a healthful diet is limited at best in our society (Popkin *et al.*, 2005). While recognition of the value of physical activity is widespread, knowledge of how to make physical activity a part of daily life and motivation for doing so are not (Fenton, 2005; Keim *et al.*, 2004). Literacy levels in general, and health literacy levels in particular, are far from ideal. This increases the time providers must spend explaining lifestyle guidance, and increases the risk of misunderstanding and non compliance (National Academy on an Aging Society/Center for Health Care Strategies, 1998).

Several studies have documented strategies and interventions to address these barriers effectively. These include providing information and raising awareness of obesity and its consequences through community venues such as schools, shopping malls, supermarkets and both print and electronic media (Caldwell *et al.*, 2005; Potter *et al.*, 2001).

Also, use of patient communication models (Epstein *et al.*, 2005; Glasgow *et al.*, 2001a; Irving & Dickson, 2004; Makoul, 2003) helps prepare the patient for the medical visit and facilitate effective communication and discussion.

Efforts to cultivate health literacy regarding weight management include the provision of tailored information specific to patient needs, summarizing the instructions by asking the patient to repeat the instructions, providing clear and concise instructions on next steps, offering small amounts of information at a time, and using educational materials written at the appropriate reading level. Also useful would be the inclusion of instruction in nutrition and practical approaches to routine physical activity in both primary and secondary education (Ad Hoc Committee on Health Literacy for the American Council on Scientific Affairs, 1999; Ezenwaka & Offiah, 2003; Gerber *et al.*, 2005; Kennen *et al.*, 2005; P. H. Noel *et al.*, 1998b; Williams *et al.*, 1998; Rothman *et al.*, 2004).

Support of patient self management skills is a key component of effective weight management and improved patient outcomes. Self-management support goes beyond traditional knowledge-based patient education to include processes that develop patient problem-solving skills, improve self-efficacy, and guide application of knowledge in real-life situations. A more collaborative approach between the patient and provider is recommended to help patients come to their own decisions by exploring their uncertainties and identifying their personal barriers to change (Baker *et al.*, 2005; Barlow *et al.*, 2005; Caldwell *et al*., 2005; Deakin *et al.*, 2005; Norris *et al.*, 2001; Wantland *et al.*, 2004).

Patient families remain an undervalued asset in obesity control efforts. Yet their potential to affect outcomes is considerable and their role should be fully incorporated into any model designed to address obesity. Also, social support and participation in collaborative chronic care groups has been shown to improve outcomes in chronic conditions such as diabetes and heart failure and may be equally applicable to weight loss programs (Nthangeni *et al.*, 2002).

Provider

The ideal provider would be knowledgeable and trained in the essentials of behavioral counseling, possess the necessary self efficacy and motivation for counseling, and be equipped with the necessary tools and materials to counsel patients on weight management effectively, persuasively, and efficiently.

In a recent survey by Zogby, most people surveyed thought that their doctors should play a more active role in promoting a healthy lifestyle, and two thirds thought it important for a doctor to focus on preventive measures, such as diet and physical activity, rather than just diagnosing and treating illnesses (Truswell, 1999). Also, patients who were advised to lose weight were nearly three times more likely to report an attempt to do so than those who did not receive such advice (Galuska *et al.*, 1999). However, it appears that the most common experience by patients of any weight is that their physician does not bring up the issue. Multiple studies confirm this observation (de Fine Olivarius *et al.*, 2005; Maheux *et al.*, 1999; Wee *et al.*, 1999). More disturbingly recent studies indicate that disparities in professional advice to lose weight associated with income and educational attainment increased from 1994 to 2000 (Honda, 2004; J. E. Jackson *et al.*, 2005; Lin & Larson, 2005; Wee et al., 1999).

The barriers to effective counseling by primary care providers are well documented and include lack of brief and effective counseling techniques, lack of self efficacy for counseling, lack of validated tools and materials for counseling, lack of evidence of effectiveness of counseling and lack of reimbursement. The demands and limitations of a busy primary care practice preclude any meaningful discussion about lifestyle behaviors by the clinician. The typical primary care physician cares for 1,500 to 3,000 people in a community, depending on its demographics. This visit-dependent model of care allows a physician about an hour per year per patient and limits the clinician's ability to provide adequate preventive care. More importantly, clinicians express little confidence in the utility of behavioral counseling. Although clinical guidelines

for obesity management are widely available (HSTAT, Evidence Syntheses, formerly Systematic Evidence Reviews 21) they have not resulted in significant changes in practice patterns pertaining to weight counseling (N. Campbell & McAlister, 2006; Genuis, 2005; Glasgow *et al.*, 2001b; Goolsby, 2001; Klardie *et al.*, 2004; Larsen *et al.*, 2006; Mazza & Russell, 2001; R. S. Thompson, 1996).

Historically, weight management counseling has been sporadic and largely limited to knowledge based instruction based on the belief that increasing a patient's knowledge about obesity would lead to behavior change and improved health outcomes. Eliciting information about patient's personal assessment of risk and barriers to change is neglected and the advice is prescriptive and generic in nature with a focus on clinical outcomes rather than day to day strategies of dealing with overweight or obesity. These efforts are further hampered by the inability of clinicians to assess patient's readiness to change and functional health literacy. The dearth of culturally appropriate materials and resources to inform the discussion contribute to the lack of success of weight counseling efforts (Nawaz *et al.*, 1999; Nawaz & Katz, 2001; Nawaz *et al.*, 2000; Nicolucci *et al.*, 2000). Many strategies to help optimize provider performance are based on behavior change theories and models that describe the social, cognitive, psychosocial and environmental determinants of health behaviors. Broadly speaking, the Health Belief Model, the Theory of Reasoned Action and the Stages of Change Theory focus on the effect of individual factors such as knowledge, attitudes, beliefs, prior experience and personality on behavioral choices, while the Social Cognitive Theory, the Community Organizing Theory and the Social Marketing Theory focus on the processes between the individual and the groups that provide the necessary support. Applied as originally developed, these models tend to be time consuming, resource intensive and tailored to psychological models of care; however, they can be adapted to the requirements and limitations of the primary care setting (Abrams *et al.*, 1999; Elder *et al.*, 1999; Glanz *et al.*, 1999; Heaney & Israil, 1999; Institute of Medicine, 2001; National Cancer Institute, 1995; Prochaska & DiClemente, 1983; Stokols *et al.*, 1996).

Thus, several counseling programs have adapted the constructs of these theories to fit the primary care context. Most of these programs use a general approach to assisting patients that includes *the five A's: Assess, Advise, Agree, Assist and Arrange*. The Worcester Area Trial for Counseling in Hyperlipidemia (WATCH), Patient-centered Assessment Counseling for Exercise and Nutrition (PACE) (Albright *et al.*, 2000; Patrick *et al.*, 2001) Activity Counseling Trial (ACT) (King *et al.*, 1998), Physically Active for Life (PAL) (Keim *et al*., 2004; Pinto *et al.*, 1998) the Step Test Exercise Prescription (STEP) (Petrella *et al.*, 2003) and the Pressure System Model (PSM) (DL. Katz, 2001a) developed by one of the authors (DLK), have provided early evidence for the efficacy of counseling in the primary care setting. Elements that can increase applicability and ease of implementation of a model include enhanced provider training, explicit guidance on counseling strategies, brevity of the counseling script, standardized, validated instruments to assess the patient, and clear delineation of provider response and responsibility. The clinician should be encouraged to use directive questions and reflective listening to encourage patient goal-setting, action-planning and problem-solving that

is tailored to the patient's unique situation (DL Katz *et al.*, 2002; D. L. Katz, 2002; B. Marcus *et al.*, 1997; Ockene *et al.*, 1995; Yeh *et al.*, 2003).

Shifting part of the burden of care to support staff is particularly relevant for poorer communities. Encouragingly, there is ample evidence of successful nurse led programs for managing chronic diseases in developing countries. By optimizing the use of human resources, appropriate obesity control and management programs can also be implemented in resource poor regions in the United States (Barlow *et al*., 2005; Dickey *et al.*, 1999; Rothman *et al.*, 2005; Yarmo, 1998).

Physicians' health behavior characteristics and personal self efficacy for targeted health behaviors has been associated with reported lifestyle counseling of patients. Therefore promoting healthy lifestyle behaviors among primary healthcare providers may potentially improve physician counseling rates (Abramson *et al.*, 2000; Frank *et al.*, 2003; Frank *et al.*, 2002; Livaudais *et al.*, 2005).

Non-Clinical Support Staff

Like the primary care provider, the practice staff should also be knowledgeable, motivated and equipped with the necessary tools to support the clinician in his/her counseling efforts. As mentioned above, time pressures severely limit the interaction between patient and provider on non-acute care matters. Thus, it is advisable to share the burden of counseling between the clinician and support staff. However, such an approach requires not only a change in how practices are organized, but some basic training for the support staff in lifestyle counseling.

Use of ancillary support staff to augment or substitute physician counseling has shown promise in several studies. In the PACE program (Calfas *et al.*, 1996; Long *et al.*, 1996; Peiss *et al.*, 1995) the receptionist initiated the counseling process by asking the patient to complete various assessment forms. This was followed by a discussion with the provider. The practice nurse then took responsibility for scheduling follow up visits and reminders. Similarly, the PSM program is supported by office staff other than the primary care provider (DL. Katz, 2001a; D. L. Katz *et al.*, 2006). Follow up and telephone reminders can be assigned to the support staff while other designated members of the practice staff can be given specific roles to support counseling efforts (Friedman, 1998; Piette *et al.*, 2000; Ramelson *et al.*, 1999; Schofferman *et al.*, 1977; Taylor *et al.*, 2005). There are various approaches to engagement of support staff in weight management, allowing for tailoring to the needs and resources of a given practice.

Human Interactions/Relationships

Addressing obesity in a healthcare setting requires the cultivation of empathetic, understanding and interactive relationships between the patient and the provider team. Such a relationship based approach is important because obesity and overweight are stigmatizing conditions (see Chapter 6). Indeed, obese subjects experience a pattern of denigration and condemnation that is so pervasive as to constitute civilized oppression (Harvey, 1999; Levy & Williamson, 1988; Rogge *et al.*, 2004).

The term "relationship based care" refers to both the philosophical foundation of the model and its operational framework and focuses on three crucial interactions: care provider's relationship with patients and families, care provider's relationship with self, and care provider's relationship with colleagues. At the heart of relationship based care is the creation of healing associations by gaining an understanding of the other's experience, leading to the delivery of compassionate care. Barriers to widespread adoption of the relationship model include lack of education and training of practice staff, costs associated with the training, and the cultural and process change required to implement such a model (Beach & Inui, 2006; Tresolini, 1994).

Relationship-Based Care has been implemented in clinical settings with tangible benefits for the patients and the care givers. The caring experience, interactive style and healing environment provided by the model can be effective in weight management in primary care practices. There are three Rs of the Relationship-Based Care model – roles, responsibilities and resources. Effective application of the model involves the creation of interdependent, collaborative, multidisciplinary teams where each member has clearly articulated roles and responsibilities commensurate with their skills and knowledge. In addition, resources at the point of care delivery are managed judiciously and authoritatively by the managers and clinical staff responsible for care.

Based on these three Rs the operating culture of the practice can potentially be reorganized to address obesity sensitively and compassionately. The I^2E^2 formula is a practical measure that defines four elements required to change the environment of care. The formula is widely used to assess the implementation of relationship based care processes. Using the I^2E^2 formula (inspiration, infrastructure, education and evidence) as a guide, the patient provider relationship, staff personal skills and competencies, and interpersonal relationships between the healthcare team can be transformed to establish and cultivate ongoing therapeutic relationships with patients and their families (De Camargo & Coeli, 2006; Forman, 2004; Scott *et al*., 2004; Kearney *et al.*, 2000). Both patients and providers are apt to address weight management more constructively when the topic is comfortable for both groups, and the relationship between them strong and positive.

Infrastructure/Facilities

The ideal waiting area in a practice would provide ample information on obesity prevention and control and encourage the patient to learn more about healthy living. Larger practices would offer more facilities. Barriers to redesigning the practice include lack of resources, competing demands on space and lack of suitable health information to provide to patients. Furthermore, there is no comprehensive multimedia patient education program available as a single package that creatively utilizes the opportunity to educate the patient (McVea *et al.*, 2000; Oermann *et al.*, 2003; Shiroyama *et al.*, 1997; Stanley & Tongue, 1991; Wicke *et al.*, 1994).

Some of these barriers can be overcome easily. A simple step would be to place scales and other devices for assessing weight/adiposity in a convenient place in the office and then actively encouraging their use. This can be supplemented by the availability of patient education material pertaining to weight management for the entire family and access to interactive, computerized

assessment tools in the waiting area, with suitable arrangements to protect privacy. Provision of skill building exercises such as planning a healthy meal, interpreting food labels, or identifying credible sources of information on the internet, is likely to lead to increased patient understanding and receptivity to a discussion of weight control with their healthcare providers (Collings *et al.*, 1991; Elliott & Polkinhorn, 1994; Koperski, 1989; Philipp *et al.*, 1990; *Stanley & Tongue*, 1991; Varnavides *et al.*, 1984). Larger practices may offer a community classroom with interactive computer kiosks, space for group meetings, a teaching kitchen and perhaps even a small fitness center free to patients. These approaches can be piloted in managed care or group practices to assess their feasibility and utility (Gerber et al., 2005).

Medical Technology/Resources

Ideally, providers would use the latest medical technologies in obesity prevention and control. Although advanced medical technologies for measuring fat distribution are now available (Goodpaster, 2002) they are generally not used by clinicians. The main barriers to widespread utilization of these services – including computed tomography, magnetic resonance imaging, and underwater weighing for total body fat content- is cost and limited evidence to date of added value commensurate with that cost. The putative value of such anthropometric measures would encompass enhanced risk stratification, and enhanced motivation for behavior change.

Creative use of medical assessments such as medical imaging of body fat or measurement of body composition may be used to convey the magnitude and severity of the health risk. These technologies may have the potential to serve as a powerful basis for individualized advice, and a powerful motivator of behavior change. Strategic use of these diagnostic technologies may facilitate lifestyle modification and should be explored further. Some useful guidelines for comprehensive evaluation of obesity-related risks are available in the literature on bariatric surgery (Blackburn *et al.*, 2005; Saltzman *et al.*, 2005). There is some evidence that imaging modalities may influence behavior in ways that other measures of personal risk do not (Lederman *et al.*, 2006).

Networking Capacity/Coordination

A model obesity prevention and management network would be located either within a managed healthcare plan or a geographic entity or both. It would utilize a family/household based approach and would reinforce the same basic message of healthy lifestyle to all family members through multiple portals and resources such as pediatricians, internists, family practitioners and obstetricians. Specialists such as cardiologists would work in tandem with the generalists to encourage patients to adopt healthy lifestyles, and other providers such as dentists would also provide pertinent advice.

Today there is little coordination between primary providers of patient care and other health professionals. Barriers to formation of such networks include primary care/specialist conflict, lack of incentives to establish networks and improve communication, and lack of local leadership to integrate obesity prevention and management efforts.

The creation of local healthcare networks dedicated to obesity prevention and control efforts can serve to complement and reinforce the clinician's effort

at weight management. Increased referrals to dietitians, physical fitness instructors, weight loss programs, and other local resources can augment the counseling efforts of physicians and increase success rates (Katon *et al.*, 2004; Provan *et al.*, 2003; Provan *et al.*, 2004; Rothman et al., 2005). Expanding the provision of weight management advice into other clinical encounters such as dental visits, could further reinforce key messages. These referrals require regular communication between the care providers. Use of a central electronic database can help all the care providers track patient progress and coordinate care efforts (Faulkner *et al.*, 2003; Jacobs & Rauber, 1996; Lee, 1997; Provan *et al.*, 2005; Unutzer *et al.*, 2002; Wager *et al.*, 1997).

Repeated Communication

Under ideal circumstances, practices would provide regular, proactive follow up by mail, telephone or online. The anatomy of follow up counseling would be clearly outlined, staff would be trained in counseling, and the practice would be structured to include reminders and prompts to engage in on-going counseling. Such a vision for coordinated care highlights the inter-dependence of the varied components of the health care system in any meaningful effort to curtail the spread of obesity. Regrettably, the use of such communication tools, and the attendant coordination of services, is limited to date. This may be attributed to untrained staff, cost pressures and the absence of a structured process to facilitate counseling.

Several studies have demonstrated a dose response effect – the greater the number of contacts the more effective the results (Jeffery *et al.*, 2004; Jeffery *et al.*, 2003). The benefits of follow up contact by practice staff between clinical consultations with the physician in the form of email exchanges, mailing of print materials, and brief telephone discussions to assess progress and ensure compliance has been established (Bray *et al.*, 2005; GESICA Investigators, 2005; Kaplan *et al.*, 2003; Kelly *et al.*, 2005; Logue *et al.*, 2005; McBride & Rimer, 1999; Randomised trial of telephone intervention in chronic heart failure: Dial trial, 2005). These methodologies represent an effective and inexpensive way of engaging the patient, addressing barriers to weight loss in a timely fashion, increasing support staff involvement in weight management efforts, and building better patient and provider team relationships. Advances in system automation should allow for greater use of communication technology at lower costs.

Information Technology

An optimal information technology system for weight management in a healthcare setting would include web based behavioral intervention, tailored messaging, interactive provider monitoring and feedback, and maintenance of an electronic database. Barriers to integration of information technology in healthcare systems are cost of implementation, practice reorganization, training of staff, and access and acceptance by patients (Hersh *et al.*, 2001; B. H. Marcus *et al.*, 1998; O'Toole *et al.*, 2005; Revere & Dunbar, 2001; Tate *et al.*, 2001).

A review of the literature indicates that successful behavioral interventions targeting modifiable lifestyle characteristics have several common design attributes. These include offering tailored informational advice, ipsative

feedback (assessing present performance against the prior performance) and self monitoring. The use of information technology such as computer assisted obesity interventions, use of web based self help tools in commercial weight loss programs, telephone delivered tailored information, and interpersonal feedback to enhance each of these features has led to improved health outcomes and sustained behavior change. Mobile systems may have clear advantages over computer, telephone, or print communication systems for delivery of tailored health behavior interventions, because of their "anytime, anywhere" messaging and communication capability and other features (Gorman, 2000; Mann, 1998).

The public adoption of cellular phones, wireless PDAs and the Web also permits greater monitoring and feedback by clinical personnel. Application of interactive behavior change technology (IBCT) to deliver behavior change counseling before, during or after the office visit to enhance patient-clinician interaction has shown promise. Similarly, internet usage, clinic based CD-ROMs and interactive voice response telephone calls have been shown to be potentially feasible and valuable adjuncts to clinic based behavioral counseling (Glasgow *et al.*, 2004a; Panniers *et al.*, 2003). Studies show that these ubiquitous technologies can lead to clinically significant and sustainable weight loss among primary care patients. A pertinent example of the use of information technology to improve patient outcomes is the use of cellular phone technology to deliver tailored messages to patients with diabetes. The system analyzes biomedical data such as HBA1c values, fasting blood glucose and blood pressure to generate and transmit tailored text messages to the patient. These timely, personalized reminders serve to enhance patient motivation and compliance to therapeutic regimens. The feasibility of the system for Type 2 diabetes management is currently being evaluated in several community health practices through funding by NIH (Bodenheimer, 2005; Cumbo *et al.*, 2002; Dorr *et al.*, 2006; Helwig *et al.*, 1999; Vickery, 2000; Wantland *et al*., 2004).

Equally important is provider access to state-of-the art, electronic decision support systems at the time of clinical decision making. Such systems can help raise the standard level of care and have already shown promise in managing conditions like asthma and diabetes (Cherry *et al.*, 2002; Chuang *et al.*, 2000; MacLean *et al.*, 2006; Polniaszek & Klinger, 2004; Tufano & Karras, 2005; Zrebiec, 2005).

Patient Flow Management: Group Visits

Ideally, patient management and interaction would be maximized by the use of innovative strategies such as group visits. Each visit could be led by a physician or could include multiple providers such as a dietitian or a behavioral therapist. The encounter would be longer than the 15 minutes generally allocated to a non acute consultation.

Commonly encountered impediments to group visits include lack of time and conflicts in scheduling. Frequently, practices lack professionals other than the physician to lead group visits. Also, patient resistance to group visits due to privacy concerns has been reported in some studies (Miller *et al.*, 2004; E. Thompson, 2000).

Group visits have been used for a variety of chronic conditions such as osteoporosis, diabetes and coronary heart disease (Bray *et al*., 2005; Porta & Trento, 2004). They can easily be structured to address weight management in primary care. Strategies to enhance the group visit include the addition of a patient education component to emphasize self-management. Physicians and patients can work together to create behavior-change action plans, which detail achievable and behavior-specific goals that participants aim to accomplish by the next session. Once plans are set, the group may discuss ways to overcome potential obstacles and raise patients' self-efficacy and commitment to behavioral change. Patients' family members can also be included in these group sessions (Houck *et al.*, 2003; Masley *et al.*, 2000; Mathur *et al.*, 2005; Noffsinger *et al.*, 2003).

Group visits can contribute to interactive health literacy by offering opportunities for dialogue, experiential learning and developing personal skills in a supportive environment (Hartman *et al.*, 1994; Nutbeam, 2000; Rothman *et al*., 2004). In addition, group visits can serve as a vehicle for ongoing social support in weight loss efforts. Participants can offer emotional support by expressing approval or appreciation for the patient's behavior. The group may provide appraisal support by helping the patient understand the implications of obesity and what resources or coping strategies may be used to achieve weight loss (Rickheim *et al.*, 2002; Trento *et al.*, 2001). The role of group visits for weight maintenance has been assessed (DL Katz et al., 2002; Yeh et al., 2003) but remains uncertain.

Outreach Activities

Ideally, primary care practices would engage in a variety of community outreach activities to enhance clinical weight management efforts. Outreach may be defined as efforts by the healthcare providers to actively involve the community in obesity prevention and control. This would include partnering with grassroots community based organizations to offer educational seminars and skill building classes, offering training to non-medical personnel such as peer educators and health advisors, and working with community institutions such as schools, community clinics, local businesses and media outlets to advocate for environmental and policy change. In reality, this does not happen often or in a systematic way. Time and cost pressures limit the ability of the provider to reach out to the community, and the leadership and incentives required for this are generally not there.

A review of collaborative partnerships shows that involving and empowering residents and outreach activities to include the community in health promotion can lead to improved outcomes. An example of a successful outreach activity is the Hochunk Youth Fitness Program which is a partnership among healthcare professionals, youth services, social services and area school districts to reduce the incidence of childhood obesity, prevent adult obesity, and set up an infrastructure to address children at risk for diabetes. Daily communication within the partnership network contributed to the success of the program (Y. Jackson *et al.*, 2002). In another example, family physicians served as community leaders and agents of change to partner with schools to help families deal with asthma. They provided school nurses with asthma action plans and helped organize asthma camps (Butterfoss & Francisco,

2004; Gamm, 1998; Landis *et al.*, 2006; Margolis *et al.*, 2001; Roussos & Fawcett, 2000; Wagner *et al.*, 2001b). Such grass roots strategic models of community inclusion can easily be applied to identify, implement, strengthen and sustain collective efforts for the prevention and management of obesity.

In-reach Activities

In-reach activities, that is initiatives led by the community to engage and interact with health care providers and systems, in an ideal setting, would involve a set of coordinated community efforts for weight control and management that are led by non-clinical entities. However, community organizations have disparate missions and the lack of focus and coordination on obesity related issues, compounded by a lack of incentives, limit these activities in reality.

Community resources are required to enhance uptake of clinical counseling. In the case of weight management, this may be especially salient: advice to improve diet and/or increase physical activity requires the availability of foods and fitness facilities that conform to the clinical guidance (Sallis & Glanz, 2006). Since patients and their families spend the majority of their time outside the clinical setting, a supportive community environment may be essential for sustained behavior change (Gordon-Larsen *et al.*, 2006; Morland *et al.*, 2006). Linkages between the primary care system and community organizations can eliminate redundancies in obesity prevention and control efforts. Recognized community structures such as health ministries, community boards and chambers of commerce can pull in primary care providers and jointly develop programs best suited to support obesity control efforts (Parker *et al.*, 1992).

These efforts can be modeled on an award winning program – Sickness Prevention through Regional Collaboration (SPARC). The program consists of a collaboration between private practitioners, public health nurses, local hospitals and academic centers to increase the delivery of preventive services to the community by creating new points of contact and building activities tailored to the community (Sickness Prevention Achieved through Regional Collaboration). The program can be applied to prevent and control obesity in the community by offering screenings at churches, schools and community clinics to identify individuals at risk for obesity related health conditions. Also, license renewal or voter registration can be linked to a health risk assessment. Such innovative strategies that capitalize on existing infrastructure and increase delivery of prevention education and services to the community can prove to be quite effective.

Another area of considerable promise is worksite wellness programs (see Chapter 15). Employers have a clear benefit in having healthy workers and are thus a natural, and usually well funded, potential partner in obesity prevention efforts.

Financing

In an ideal world adequate financing would be available to encourage obesity prevention efforts. However, in the current U.S. health care system, reimbursement for behavioral counseling is limited at best. The financial underpinnings of the system lead to commentary that is about “sick” care rather

than "health" care, with incentives for pharmacotherapy and procedures rather than prevention.

Creating a reimbursement structure to compensate clinicians for counseling can go a long way towards improving the rate and quality of lifestyle counseling. Encouragingly, recent changes in the Medicare statutes make it possible to identify obesity as a disease, and this opens the door to reimbursement for its management in the federal system. Under the plan, Medicare will "be able to review scientific evidence in order to determine which interventions improve health outcomes for senior disabled Americans who are obese." Also, Congress recently expanded Medicare coverage to offer medical nutrition therapy as a strategy for treating and managing conditions like diabetes, hypertension and heart disease (Fitzner *et al.*, 2003; L. F. Martin *et al.*, 2000; Stern *et al.*, 2005; White, 1999). Private insurers support the classification of obesity as a disease and are looking to Medicare for direction in setting standards of what is effective and what should be covered. These changes are promising and may make a significant difference in obesity prevention and control efforts.

Whether or not it is appropriate to classify obesity as a disease, it is certainly on the causal pathway toward leading chronic diseases. There is thus a strong financial incentive for the provision of effective weight management counseling. If payers have been reticent to reimburse for weight control counseling, it is partly due to the relative lack of evidence that such counseling is, indeed, effective.

In this context, it is worth noting that absence of evidence of effectiveness is not necessarily evidence of an absence of effectiveness. When the best available counseling constructs are applied, particularly in concert with effective outreach and inreach, effective weight management guidance in primary care may well be achievable.

If providers are reluctant to counsel without reimbursement, and payers are reluctant to reimburse without evidence that counseling is effective, an impasse results (Murray & Frenk, 2000). Resolving it requires meeting the needs of both parties simultaneously. In a regional obesity control initiative in New England conducted with support from the New England Coalition for Health Promotion (The New England Coalition for Health Promotion and Disease Prevention) a proposal to resolve the impasse is currently under development. The plan would call for the creation of an on-line weight counseling training program offering continuing medical education (CME) credits, along with credentialing. Providers completing the training and earning credentials would be entered into a database to which insurers would have access.

Insurers would thus be in a position to identify providers suitably trained to offer "state of the art" weight management counseling, and reimburse for their services. The website (construction of which is currently under way) could further house key quality control indicators to be used in the documentation of care, which would be useful for quality audits. Ideally, the program would be restricted access at first so that a controlled evaluation of costs and benefits could be conducted. A pilot period of 2–3 years should be ample to determine if the system is cost-effective, attractive to insurers, and should be made accessible to all.

Accountability/Regulation

Given the obesity epidemic in the United States, one would expect major, coordinated regulatory efforts to attack the scourge. Instead, public policy

barriers contribute to the inadequate obesity prevention and management in the United States. Weight management requires stability and continuity of care yet the primary care system remains organized around a "spell of illness" which by definition is time limited. Reimbursement is structured to reward this orientation and there are no incentives for practitioners to deliver systematic and coordinated programs for weight management (Casalino *et al.*, 2003; Wee *et al.*, 2001).

Pay for performance programs in the primary care setting have the potential to reward care coordination, time spent counseling a patient with chronic conditions, and prevention efforts through better financial incentives (Grumbach *et al.*, 1998; Roski *et al.*, 2003). Currently, the Center for Medicare and Medicaid Services compensates physicians on the number and complexity of services provided to patients. Under pay for performance programs, providers will be rewarded for cost savings by focusing on prevention, risk identification and quality of care. This restructuring of payment mechanisms can lead to an increased focus on lifestyle modification and prevention of obesity. Tracking of pertinent HEDIS measures in primary care, such as childhood preventive care, counseling for risk factors, and screening for cholesterol and blood glucose, can help evaluate the effectiveness of obesity prevention, and management and provider incentives can be linked to these performance measures. Direct patient incentives and disincentives can also play an important role in the success of weight management efforts (Baker et al., 2005; Hubbert *et al.*, 2003).

Integrated Systems Approach

The measures and interventions described above represent a veritable menu of opportunities to redesign the existing primary health care system to deliver optimal obesity prevention and control care to patients. Under each of the components of the healthcare system, there are some easy to implement recommendations and others that require more time, effort and resources. Also very important is the integration of these efforts to amplify the total systemic change (Lewis & Dixon, 2004).

Systems thinking approaches to obesity prevention and management, based on systems thinking theory (Senge, 1994) permit the use of diverse methods, resources and strategies to design effective solutions that achieve broad reach and have long term impact. These approaches are designed to facilitate and optimize interrelationships between key stakeholders, data, information sources, theories and principles leading to a single common process intended to generate sustainable solutions (Pronk *et al.*, 2004).

Several promising programs to population health improvement have been outlined in the literature by Pronk & O'Connor, 1997. The authors examined the impact of integration of clinical guidelines with office systems in a managed care setting using diabetes as an example. Specific changes in the office system included provision of clinical guidelines and specific health goals, setting up a clinical database that could identify and monitor patients eligible for guideline based care, and providing guideline directed clinical care based on cues from the database. Successful application of this strategy resulted in improvements in population health.

Similarly, another study by Pronk and Boucher outlined an effective systems approach to childhood obesity prevention and management in a MCO setting. The intervention involved various actors: child/adolescent, family unit, physician and allied health professionals. Salient features included processes to facilitate effective communication, long term support and access to resources. Participants could enter the system at multiple points including the healthcare clinic, school or the home. Once in the system a closed loop process allowed resources to be shared with the patient, the family, as well as the healthcare provider (Pronk & Boucher, 1999).

The authors built on their previous work by developing an integrated system for the implementation of lifestyle and behavior change programs across multiple settings and media. The system had three basic components: organizational staff with clearly delineated roles, computer technology that connected multiple staff, multiple types of service delivery functions and protocols for decision support. The real value of the approach was in the integration and organization of the three components of the system to generate behavior change in the population reached (Pronk *et al.*, 2002).

Pronk *et al*. revisited health systems design in another study designed to address multiple risk factors in primary care. They generated a series of recommendations at both the patient and the practice level to support counseling for multiple health behaviors. Many of their recommendations are consistent with those outlined earlier in this chapter (Glasgow *et al.*, 2004b).

Another systems approach, the Chronic Care Model (CCM), identifies the essential elements of a health care system that encourage high-quality chronic disease care. These elements are the community, the health system, self-management support, delivery system design, decision support and clinical information systems. Evidence-based change concepts under each element, in combination, foster productive interactions between informed patients who take an active part in their care and providers with resources and expertise. The net outcome is healthier patients, more satisfied providers, and cost savings (Felt Lisk & Kleinman, 2000; McCulloch *et al.*, 1998; Wagner, 2004).

A recent randomized controlled trial by Piatt *et al*. assessed the applicability of the CCM model to initiate and sustain systems change in group practices serving socio-economically depressed communities. The intervention consisted of an audit chart to establish existing quality of diabetes care. Participating practices were randomized to either CCM group, provider education group or usual care. This pilot study found that a CCM-based intervention was effective in improving clinical, behavioral, psychological/psychosocial, and diabetes knowledge outcomes in patients with diabetes. The CCM group, which received both patient and provider education, demonstrated significantly improved A1C levels, non-HDL cholesterol levels, and rates of self-monitoring of blood glucose compared with the other study groups (Piatt *et al.*, 2006).

The CCM has guided a number of American healthcare organizations to improve their efforts in care for chronic illness (Bodenheimer, 2003; Bodenheimer *et al.*, 2002b; Ferlie & Shortell, 2001; Wagner *et al.*, 2001a).

Most of these organizations have made measurable improvements in the quality of their care. A recent review of the literature reiterates that the most successful chronic disease improvement strategies are consistent with concepts and components identified in the CCM. The systems approach described in this chapter is similar to the CCM approach, but applied also to prevention.

The World Health Organization (WHO) convened a group of health leaders from a number of countries to revise and enlarge the CCM. The resultant effort was the Innovative Care for Chronic Conditions (ICCC) framework. The framework demarcates the various components of the healthcare system into micro (patient and family), meso (healthcare organization and community), and macro (policy) levels (see Table 1) (Bodenheimer *et al.*, 2002a; Epping-Jordan, 2005). It highlights the need for comprehensive system change – and recommends that specific changes in each component be tailored to unique needs and available resources (Barr *et al.*, 2003; Epping-Jordan *et al.*, 2004).

To date many building blocks of the ICCC Framework have been evaluated in healthcare systems globally. These programs have improved biological disease indicators, reduced deaths, saved money and healthcare resources, changed patients' lifestyle and management abilities, led to cost savings and improved processes of care. The building blocks of the ICCC model closely adhere to the elements outlined in this chapter. These components provide the basis for redesigning the existing U.S. healthcare system to provide effective obesity prevention and management (Barr et al., 2003; Casalino et al., 2003).

Systems change is not easy and there is no one size fits all model from previous research and experience that can be responsive to the needs of all practices (Cranney *et al.*, 2001; Mayberry & Gennaro, 2001). Rather healthcare systems that implement a series of small experiments and keep revising and refining these until they get it right are more likely to achieve their stated goals. The Plan-Do-Study-Act (PDSA) cycle is a continuous quality improvement model consisting of a logical sequence of repetitive steps that has been used extensively in the health care field. It consists of small-scale tests of planned actions, followed by assessment and improvement of the initial plan. Numerous small cycles of change accumulate into large effects through synergy. The PDSA evaluation process allows practices to tailor changes to their needs and leads to continuous refinement and improvement (Berwick, 1996, 2003; Berwick & Nolan, 1998; S. M. Campbell *et al.*, 2002; Grol, 2001; Monteleoni & Clark, 2004; Pruitt & Epping-Jordan, 2005; Ramsey *et al.*, 2001; Smith, 2003).

Future Directions

Effective obesity management by health care systems in general, and primary care systems in particular, will require reorienting the system to adequately address the need of the patient and produce the desired outcomes. These differ from those considered important for the acute care system. Dealing with obesity in primary care requires providing patients with broad support not limited to biomedical outcomes. The healthcare system should provide self management skills, planned and patient centered care, and integrated care that cuts across time and settings (Hill, 2005).

The system to address obesity related issues will also require a departure from the physician dominated model. Establishment of multidisciplinary teams, with clear delineation of roles and responsibilities according to capacity and skills, is essential to weight management in primary care (Lawrence, 2002). Changes in medical and information technology should also be leveraged to increase effectiveness and save costs.

Community partners and resources can serve to augment clinical care systems and personnel by taking on functions traditionally assigned to public health workers. Peer educators and lay health advisors can play a key role in obesity prevention. Educated and prepared community partners can reduce the burden of obesity management on clinical personnel and can deliver follow up services and social support to patients and their families (Dohlie *et al.*, 2000; Olden, 2003).

Reimbursement and healthcare insurance programs should be changed to facilitate and sustain integrated, flexible and adaptable healthcare systems that ensure evidence based care with a focus on preventive, quality obesity care. Policy makers should recognize obesity as a serious medical and economic problem, and drive the systemic change that is required with some urgency ("It's time to tackle the high cost of overweight and obesity", 2005; Klein, 2005).

While the components of the health care system can be isolated for purposes of discussion, they are, in fact, parts of a whole, and must be repackaged as such for effective weight management to be widely achieved. Patients must receive prior education in determinants of weight so that the entire burden of such instruction does not fall to the clinical setting. Providers must be schooled in effective counseling methods, and empowered with approaches designed specifically for the clinical care setting. Messages by providers treating different members of the same family, or different aspects of an individual's health, must be consistent, complementary, and reinforcing (Melin *et al.*, 2005). Modifications of the clinical care setting and its practices should allow for multidisciplinary support of patient behavior change. Technology should be used to extend the reach of clinical support beyond the brief span of the encounter. Quality standards for weight management should be established and reinforced, with incorporation into HEDIS measures. Quality monitoring might be used to apply pay-for-performance approaches. Reimbursement strategies linked to quality of care are appropriate (McQuigg *et al.*, 2005).

Conclusion

Epidemic obesity is among the more urgent health threats faced by our population, and should thus be a priority for all health care providers, particularly those delivering primary care. A coordinated systems approach to the problem is likely to yield the best results. While a complete system overhaul may not be necessary, incremental changes should be made quickly in each of the system components outlined in this chapter. Obesity prevention and management deserve the dedicated commitment of health care professionals, community organizations and the policy makers responsible for health care finance. While there will be costs involved in revamping the health care system to deal effectively with the obesity epidemic, the costs of failing to do so will be far greater.

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