

Chapter 37

Obesity as a Clinical and Social Problem

Ann Smith Barnes, MD, MPH, Marisa Rogers, MD, MPH, and Cam-Tu Tran, MD, MS

Objectives

- Define obesity.
- Describe the populations most affected by obesity.
- Describe the health consequences of obesity.
- Discuss the difficulties with losing weight, including patient and health-care provider challenges.
- Suggest ways for health-care providers to discuss weight loss with patients.
- Describe strategies for weight loss.

Esmeralda, a 15-year-old girl, requests a written excuse to skip school physical education classes. Her body mass index (BMI) of 32 reveals that she is in the highest weight category for girls her age. She often skips breakfast and eats most meals in front of the television. Her family members are also obese and have type II diabetes.

Worldwide young and old are being affected by obesity and its complications. Indeed, the obesity “epidemic” may be one of the most significant challenges to global, as well as national health. Paradoxically, poor families are particularly affected because of coexisting undernutrition, lack of resources to eat healthily, and inadequate venues for exercise.

Tackling the obesity epidemic will be not an easy feat because its causes are complex—bridging societal issues (such as governmental subsidies of high caloric food), and personal ones (how active people are). Although health-care providers need to be engaged in the wider public health and community efforts addressing obesity, helping patients as they strive to lose weight or suffer from

its consequences remains equally important. This chapter discusses both the challenges and strategies of addressing obesity.

DEFINITIONS OF OBESITY

The most widely used classification system for obesity—an abnormal accumulation of body fat—in adults is the body mass index (BMI). The BMI estimates the amount of body fat through a calculation that adjusts weight for height (see “Resources” for online BMI calculator). A normal adult BMI is between 18.5 and 24.9. BMIs between 25 and 29.9 indicate overweight, a BMI greater than 30 indicates obesity, and a BMI greater than 40 indicates extreme obesity. Although health implications of BMI cutoffs vary across ethnic groups,¹ it is accepted that increasing BMI is associated with an increased risk of death from cancers and cardiovascular disease. Obesity was most strongly associated with an increased risk of death among never smokers who had no history of disease.^{2,3}

BMI for children, unlike adults, is both age and gender specific because children’s bodies change dramatically

Box 37-1. Classification System for Obesity

Classification	Body Mass Index for Adults	Body Mass Index for Children
Underweight	<18.5	<5th percentile
Healthy weight	18.5–24.9	5th percentile to <85th percentile
Overweight	25–29.9	85th percentile to <95th percentile
Obesity	>30	>95th percentile

as they grow, and these changes differ between boys and girls. Terminology for classifying BMI in children has changed and now the language is more consistent with the adult classification (Box 37-1).⁴ Because in older adolescents a BMI of 95th percentile is higher than the adult cut point of 30 kg/m², obesity in this population is defined as BMI > 95th percentile or BMI > 30 kg/m², whichever is lower.⁴

In adults, the *waist circumference*—the body circumference measured at the level of the superior iliac crest—is another measurement that, some argue, better explains obesity-related health risk. Increased waist circumference, a measure of central adiposity, has been shown to

be a marker for increased risk even in persons of normal weight. A waist circumference greater than 40 inches in men, and 35 inches in women is considered abnormal and increases the risk of developing hypertension, dyslipidemia, and metabolic syndrome.⁵

EPIDEMIOLOGY OF OBESITY

Between 1980 and 2013, the prevalence of overweight and obese people worldwide rose by 27.5% in adults and 47.1% in children. Sixty-two percent of the world's obese people live in developing countries. In 2013, the United States had the highest proportion of obese people, 13% of the world's total.⁶

The number of overweight and obese people in the United States has significantly increased in recent decades (Figure 37-1). In 2011 to 2012, 68.5% of adults were either overweight or obese. Of these, 34.9% of adults were obese and 6.4% had grade 3 obesity with a BMI ≥ 40 .⁷ Approximately 17% of children and adolescents aged 2–19 years are obese. In general, the highest rates of obesity are found in Latinos and African Americans as well as in populations (particularly females) with less education and lower incomes.^{7,8}

Unfortunately, obesity prevalence rates have not substantially decreased in the past decade. The prevalence of obesity in women 60 years or older has actually increased.⁷ An exception to this has been seen in young children with a decrease in obesity and extreme obesity in low-income

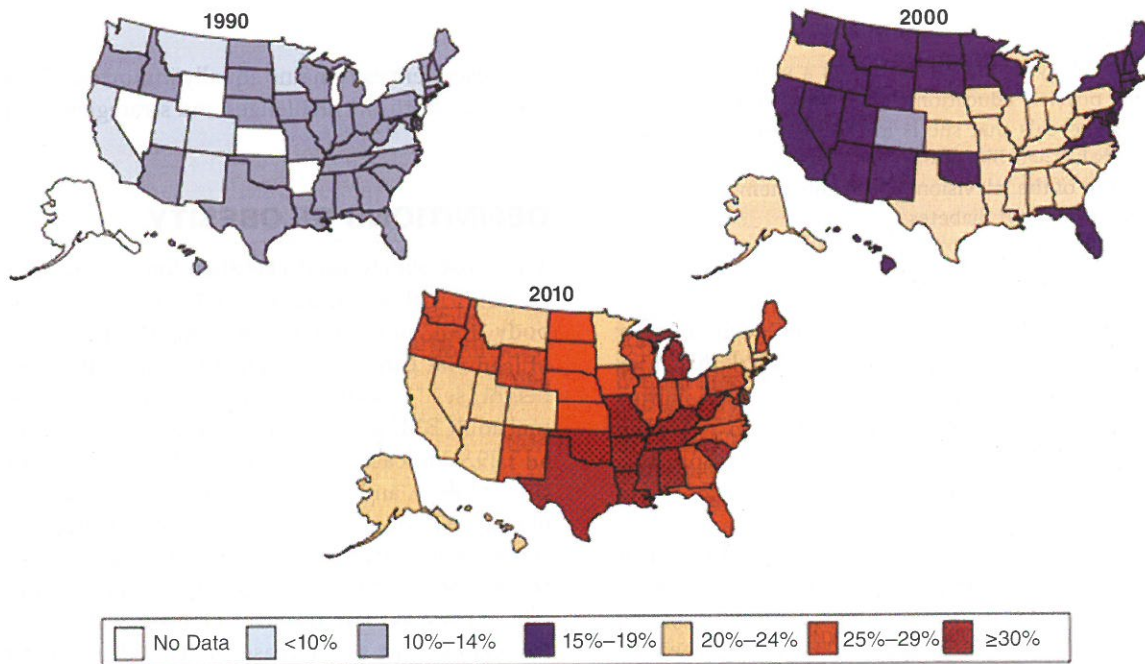


Figure 37-1. Obesity trends among US adults: 1990, 2000, 2010. Data from the Behavioral Risk Factor Surveillance System (1990, 2000, 2010) for BMI ≥ 30 , or about 30 lb overweight for 5'4" person. (Source: Behavioral Risk Factor Surveillance System, CDC. Accessed July 6, 2014. Available at: http://www.cdc.gov/obesity/downloads/obesity_trends_2010.ppt.)

children aged 2–4 from 2003 to 2010.⁹ These declines were seen in all ethnic groups except American Indians/Alaska Natives. An overall decline is further supported by data showing a 40% decrease in obesity in children aged 2–5 from 2003–2004 to 2011–2012.⁷ Reasons for these declines are unclear, but possibilities include increased breastfeeding and decreased consumption of sugary beverages. It is also unclear if this finding will persist with aging.

The economic impact of obesity is substantial. Direct medical spending for diagnosis and treatment has been estimated at up to \$147 billion a year in the United States.¹⁰ This does not include the indirect costs of income lost from decreased productivity, disability, absenteeism, and premature mortality, which when totaled are in excess of \$200 billion annually.^{10,11}

HEALTH CONSEQUENCES OF OBESITY

The health consequences of obesity for both adults and children are significant (Table 37-1). Complications such as hypertension, diabetes, elevated cholesterol levels, and sleep apnea increase the risk of cardiovascular disease, which remains the leading cause of death in both men and women. Not surprisingly, those with the highest rates of obesity suffer from the highest rates of these cardiovascular diseases as well.¹² The same trend even extends to

Table 37-1. Health Consequences of Obesity in Children and Adults

Organ System	Diagnosis
Cardiovascular	Atrial fibrillation
	Coronary heart disease
	Dyslipidemia
	Heart failure
	Hypertension
	Stroke
	Venous thrombosis
Dermatologic	Acanthosis nigricans
	Furunculosis
	Hidradenitis suppurativa
	Intertrigo
Endocrine	Diabetes/Impaired glucose tolerance
	Hyperandrogenism
	Metabolic syndrome
Gastrointestinal	Fatty liver
	Gallstones
	GERD
Musculoskeletal	Gout
	Osteoarthritis
	Slipped capital femoral epiphysis
Oncologic	Variety of cancers
Pulmonary	Obesity hypoventilation
	Obstructive sleep apnea
Psychological	Anxiety
	Depression

children. For example, nearly half of the newly diagnosed diabetes cases in pediatric populations are type 2 diabetes. This increase is attributable to increasing rates of obesity in children and is highest in African Americans, Mexican Americans, and Native Americans.¹³ Other complications of obesity, such as osteoarthritis or depression, may not be as life threatening, but may cause significant incapacity. Arthritis is the most common cause of disability in the United States.

Some of the health consequences of obesity can be mitigated by physical fitness. Those who are obese but physically fit have better mortality rates than their sedentary counterparts. However, both groups have mortality rates greater than individuals who are physically fit and not obese.^{14,15} Therefore, patients and health-care providers should note that although physical activity is beneficial, it is not a substitute for weight loss.

LOSING WEIGHT IS HARD TO DO

Esmeralda's mother works two sedentary jobs. She has failed at multiple attempts to lose weight. The family eats cheap, fatty, high-calorie food. No one in the family feels they have the money, time, or energy to exercise.

PATIENT CHALLENGES

Diet

The battle to lose weight is often thwarted by lack of time to prepare food at home and the resources to make healthy choices. Eating out at restaurants and eating prepared foods have become common and perhaps necessary as women exchanged housework for paid labor. According to the Department of Labor, among families with children, 59% of these families have dual-income parents; and among single-women head of households, the mothers are employed in 67% of these households.¹⁶ The National Restaurant Association reported that the total restaurant industry sales increased from \$42.8 billion in 1970 to \$586.7 billion in 2010. In 1950, 25% of all food spending was on food away from home, by 2014, this share rose to 47% of household food budget.¹⁷

Both larger portion sizes and poorer nutritional quality of food prepared or consumed outside the home encourage greater calorie and fat consumption than home-cooked foods. Portion sizes have been increasing in both prepackaged, ready-to-eat products and at restaurants. Overconsumption is fueled by these larger sizes marketed as providing more for your money.

In addition, increasing evidence suggests an important role for the microbiome in the metabolism of energy and has led to alternative theories regarding the role of the changing gut microbiome in the global obesity epidemic.¹⁸

Food insecurity, not having regular access to quality foods or having interruptions in eating patterns or unplanned reduction in food intake, is also linked to obesity.^{19,20} Families that are food insecure are more likely to skip meals or eat unbalanced meals which hampers healthy weight management.

Food Prices

Food prices influence food consumption. In the United States, income is associated with the type of food consumed, not necessarily the quantity.²¹ Calorie-dense foods such as sodas, fruit drinks, and snack foods are inexpensive. Government subsidies favoring corn syrup and sugar production underlie some of these price differences. Healthier foods, such as fruits and vegetables, are sold more frequently in grocery stores, which often are lacking in low-income neighborhoods.²² Higher cost, limited cooking facilities, perceived ability to satisfy hunger, and short shelf-life of fresh foods can discourage purchase of fruits and vegetables in low socioeconomic groups.^{23,24}

Physical Activity

Lack of physical activity hampers efforts at weight control and health maintenance. Long work hours, multiple shifts, increasing time devoted to sedentary behaviors such as television viewing and other media (videos and computers) have been cited as important contributors to the decline in physical activity. Less than one-third of young people meet national recommendations of engaging in physical activity at least 60 minutes each day. Rates are worse among ethnic minority groups, specifically Blacks and Hispanics.²⁵ According to the Centers for Disease Control and Prevention (CDC), fewer than half (48%) of US adults meet the current physical activity recommendations of 150 minutes of moderate physical activity each week. Again, rates are lower in Black and Hispanic populations as well as in groups of lower socioeconomic status and educational attainment.²⁶

ENVIRONMENTAL BARRIERS

Watching television is problematic not only because it is a sedentary activity but also television and radio advertisements highlight quick and easy access to food that is already prepared and of low nutritional value.²⁷ Children in particular are targeted for advertising—even in schools. Some school districts, in search of extra revenue, have contracted with soft drink companies who provide service vending machines throughout the school district. Some schools have eliminated recess and physical education, decreasing children's daily physical activity. Adults do not fare much better, as long workdays and increasing family demands serve as barriers to regular exercise.

Low-income urban neighborhoods impose other impediments to healthy lifestyles as well. The dearth of grocery

stores (food deserts) offering fresh produce and lean meat and plethora of fast food restaurants and convenience stores (food swamps) encourage high-fat, low-fiber diets. Ability to exercise may be compromised by insufficient playgrounds, and parks and trails for walking or biking. Existing areas may not be perceived to be safe. Major fitness centers rarely open exercise facilities in low-income areas, and their membership costs are expensive in most cases.

CULTURAL NORMS

Patients' motivation to lose weight is also influenced by cultural norms and expectations. Many studies have demonstrated that African Americans and some Latinos are more accepting of a larger body size than whites and Asian Americans.²⁸⁻³⁴ Consequently, some obese women may not recognize themselves as having a weight problem³⁵—this misperception in turn decreases their awareness of disease risk. Additionally, tolerance of larger adult sizes may have an impact on parental recognition of excess weight in children. A meta-analysis of parental estimation of weight status in children demonstrated that 51% of parents underestimate their overweight or obese children's weight. This underestimation is strongly influenced by parental weight status.³⁶

The impact of body-shape perceptions is also evident in minority women during childbearing years. It is widely accepted that gestational weight gain affects postpartum weight retention and risk for obesity. Certain demographic groups are at greater risk for excessive gestational weight gain. These include women of low socioeconomic strata, low educational attainment, and African-American ethnicity.³⁷ In a focus group study by Groth et al,³⁷ low-income African-American women were accepting of excessive gestational weight gain and associated it with having a healthy infant.

The role of food in many cultures also can have an enormous impact on diet, and subsequently weight control. In focus groups with mothers from low-socioeconomic strata, they admitted to using sweets to bribe their children or reward good behavior and to encouraging them to eat more even when they were full.³⁸ The use of food as reward, bribe, or pacifier and the notion of "cleaning the plate" are issues that need to be addressed in discussions of diet because they relate to healthful eating within families.

Interventions designed to help vulnerable populations with weight control will need to consider and address cultural norms and practices related to weight and body size. Focus on "healthy eating" and "active living" instead of obesity and weight loss may be more effective approaches for educating and engaging culturally diverse groups.

DISCRIMINATION BASED ON WEIGHT

Research of obese people's experiences suggests that their weight has contributed to negative treatment by strangers

and friends, at job interviews, in the work place, in social settings, at exercise facilities, and by health-care providers.³⁹⁻⁴¹ Many of the same groups that suffer discrimination based on race, socioeconomic status, and education are more likely to be obese, and consequently suffer an inordinate amount of prejudice.

It is important to acknowledge that subtle forms of discrimination exist in the health-care setting (scales that do not weigh individuals over 300 pounds, chairs with arm rests that are too narrow for obese patients, blood pressure cuffs that are too small for proper measurements). In addition, health-care providers often are guilty of blaming the obese patient for their weight problems and rarely consider the environmental, economic, and social influences on the weight of their patients.⁴² Obese patients may feel that health-care providers are not genuinely concerned about them or their health when simple courtesies are neglected. The feeling of second-class treatment or being blamed for a medical problem can negatively affect a person's interest in discussing weight loss with a provider. Recognizing and discussing an obese patient's discomfort in the medical setting can open lines of communication and foster trust relating to all health issues, including weight.

INTERNATIONAL POPULATIONS

Once considered a problem of wealthy nations, obesity rates are on the rise in low- and middle-income countries, particularly in urban areas. More than 50% of the 671 million obese individuals in the world live in 10 countries: the United States, China, India, Russia, Brazil, Mexico, Egypt, Germany, Pakistan, and Indonesia.⁶

The worldwide causes of obesity are similar to those in the United States—an increase in calorie-dense food and decrease in physical activity. Rising incomes in some countries have increased access to high-fat calorically dense foods. Additional factors related to urbanization, globalization, and modernization such as increased television viewing, eating outside of the home, and shifts in agricultural work to service and manufacturing industries have contributed as well. The health consequences of obesity are similar to those seen in the US populations, but many countries are doubly challenged combating complications of obesity as well as those of infectious disease and malnutrition. With increases in obesity driving concomitant increases in diabetes, certain infectious risks, such as those for tuberculosis, may also increase. Unfortunately, the resultant economic burden often falls on countries ill prepared to deal with it.

HEALTH-CARE PROVIDER CHALLENGES

Obesity is a preventable disease and often is described as the second leading cause of preventable death (tobacco use is the first) in the United States. However, in addition

Box 37-2. Common Pitfalls to Obesity Management

- Not regularly identifying obesity as a health problem
- Neglecting patient time and cost concerns in counseling efforts
- Not addressing need for family involvement in weight loss efforts
- Not recognizing environmental barriers to healthy lifestyles
- Not incorporating cultural expectations of ideal weight into weight loss goals
- Allowing the health consequences of obesity to overwhelm clinical encounters, leaving little time for weight reduction counseling
- Lacking the skills to counsel patients on weight loss

to difficulties faced by patients, providers have their own struggles in assisting patients with weight loss (Box 37-2).

IDENTIFYING OBESITY AS A HEALTH ISSUE

Although overweight and obesity can be identified through the BMI calculation, practitioners have historically identified, documented, and counseled only a fraction of patients whose BMI classified them as obese.^{43,44} Without identification of obesity, management strategies cannot be planned.

For health-care institutions that have adopted electronic health records, most automatically calculate BMI if height and weight are entered as vital signs. However, the challenge remains whether or not the treating health-care provider considers the abnormal number and works with the patient to manage excess weight. Approximately 69% of doctors report using electronic health records in their practice of medicine.⁴⁵

BARRIERS TO WEIGHT LOSS COUNSELING

Health-care providers have identified barriers to weight loss counseling: insufficient time, disbelief that counseling will help, and lack of skills to provide counseling.^{46,47} Although obesity often underlies many health problems faced by patients, the other acute and chronic medical problems generally become the focus of care. When faced with high blood glucose, clinicians usually choose to treat the diabetes and save the more complicated discussions of weight loss for later. Low-income and minority patients often have multiple medical and nonmedical issues limiting time for weight reduction counseling in routine clinical encounters. Until the 2011 announcement that Medicare would reimburse for primary care counseling

in obese beneficiaries, there was also no financial benefit to providers to offer support. Furthermore, many patients from these groups have not been as successful with weight loss as white participants in large (nonculturally tailored) weight loss trials.⁴⁸ Consequently, health-care provider expectations of success may be low, which further hinders clinician initiation of counseling. Despite brief intervention methods that have demonstrated success with weight loss,⁴⁶ providers continue to struggle with implementing counseling into their practices.

TIPPING THE SCALE IN FAVOR OF HEALTH

APPROACH TO WEIGHT CONTROL

Identify the Problem with Patients

Each patient encounter is an opportunity to address weight management. Obese and overweight adults with obesity-related comorbidities or cardiac risk factors and children who are overweight or obese should be targeted. Height, weight, and BMI should be recorded at every visit. For children, BMI should be plotted onto an age-specific BMI growth chart (see Box 37-1).⁴⁹ Cardiac risk factors and comorbidities related to obesity should be assessed. Elderly patients who are obese should be advised to lose weight. Weight reduction has similar effects in improving cardiovascular disease risk factors in older and younger adults.

The provider should communicate to the patient the specific BMI and the related diagnosis, actually using the term *obesity*, if applicable. Also, inform patients that obesity puts them at risk for related comorbidities and how it impacts their current health conditions (see Table 37-1).

Personalizing the message can be a useful tool. For example, patients may respond more to the message that weight puts them at risk for diabetes if they have family members who have suffered complications from diabetes. Patients' concerns about being overweight should be elicited as well. In all interactions, a nonjudgmental and supportive attitude is essential in effectively communicating about weight control.

Motivate the Patient (and Family) to Make Changes

Behavioral changes are difficult to achieve. If patients are not ready to make the necessary adjustments that losing weight requires, providers' counseling efforts can fall on deaf ears. The Prochaska and DiClemente stages—precontemplation, contemplation, action, and maintenance—can be used to assess patients' motivation for weight loss (see Chapter 12). A precontemplative patient is not ready to lose weight and may not recognize how his or her behavior contributes to the problem. The contemplative patient is considering but not committed to change. In the precontemplative and contemplation phases, providers should focus on increasing readiness to lose weight. Readiness

can be explored further by assessing patients' sense of importance of a specific behavior change and confidence in their ability to make the change. In the action phase, a patient is either losing weight or is ready to. This is the ideal time to target weight loss interventions. The maintenance patient has lost weight and is trying to keep it off. With children, the entire family must be ready for change. Because children can gain weight quickly, frequent visits can be helpful in reassessing family motivation.

Set Realistic Goals with Patients

Patients often have unrealistic weight loss goals. In most weight loss interventions, participants rarely lose and maintain more than 10% of their body weight, although many patients want to lose much more of their current body weight.⁵⁰ Traditional teaching dictates that providers should help patients set realistic and attainable goals to minimize disappointment. This has been called into question, with recent evidence suggesting that patients may lose more weight if they set higher goals.^{51,52} Regardless, providers should work collaboratively with patients to set goals that are attainable in a reasonable amount of time. Decreasing body weight by 5–10% over 6 months generally can be obtained by a weight loss of 1–2 pounds per week depending on a patient's BMI. A change in BMI that moves patients from the obese to overweight category is a success. In growing children, stabilizing weight gain is a desirable and attainable goal. Weight loss should only be attempted in adolescents who have completed their sexual maturity and bone growth.

Goals should not be limited to weight loss. For some patients preventing further weight gain and maintaining a lower weight for the long term are appropriate goals.⁵³ Goals not involving weight also can serve as motivating influences. Some examples of realistic and attainable non-weight loss goals include fitting into a certain clothing size, taking a regular walk with family after dinner, adding daily fresh fruits or vegetables, or simply feeling better about oneself.

Counsel on Improving Diet

Any successful weight loss effort incorporates changes in diet. Despite lack of formal training and time constraints, providers can and should play an active role in this area.

Elicit Useful, Accurate Information

A food diary—a detailed record of everything eaten during the day—provides the most accurate information about what the patient is eating, although they are difficult to complete. Alternatively, the patient can be asked to name everything eaten in the past 24 hours, including beverages and snacks. Other useful information includes how often the patient eats out, at what types of restaurants (making sure to specifically ask about fast food), what beverages are typically consumed, and how meals are prepared (e.g., fried, baked, broiled). The information gleaned can

be used to provide personalized messages about healthier eating. For example, a teenager eating fast food several times a week can be counseled to reduce intake by replacing a value meal with a kid's meal and replacing high-calorie foods such as French fries and a milk shake with a side salad and water. Keeping a detailed food diary itself has also been associated with weight loss.

Portion Size

Most people eat too much as an individual serving. Unfortunately, US restaurants, which often serve two to three times as much as the appropriate serving, fuel this. A simple teaching plate diagram or the MyPlate logo (Choose-MyPlate.gov) can help educate patients about portions, instructing patients that for lunch and dinner half of the plate should be composed of fruits and vegetables, a quarter meat or other source of protein, and a quarter carbohydrate (Figure 37-2). This results in larger servings of fruits and vegetables and decreases in meat and starches. Appropriate serving sizes also can be equated with everyday objects. For example, a serving of meat should be roughly the size of a deck of cards; a serving of rice, pasta, or potato, the size of a half a baseball; and a baked potato, the size of a fist.⁵⁴

Fad Diets

It is important to counsel patients appropriately about fad diets. The data suggest that low-carbohydrate diets cause people to lose more weight in the short term, but that at 1 year the amount of weight lost is similar to more conventional low-fat diets.⁵⁵ These diets are difficult to maintain. For patients who are very interested in trying a fad diet, the initial weight loss can serve as a kick-start, but patients must realize that better long-term eating habits will be necessary to keep weight off.

A Balanced, Healthful Diet

When counseling patients about diet options, healthier approaches that recommend a well-balanced eating

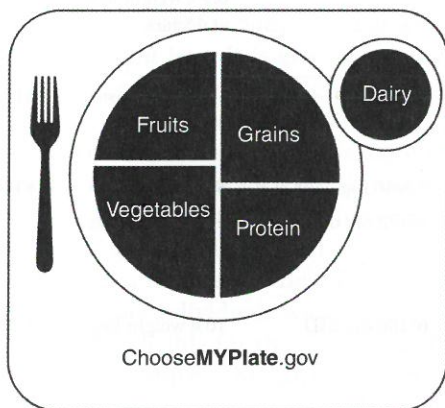


Figure 37-2. MyPlate diagram. Food portions: What your plate should look like. MyPlate illustrates the five food groups that are the building blocks for a healthy diet. (Source: U.S. Department of Agriculture. Center for Nutrition Policy and Promotion. <http://www.choosemyplate.gov/>.)

plan of fresh fruits and vegetables, whole grains, low-fat dairy, and lean protein are best. The DASH (Dietary Approaches to Stop Hypertension) eating plan, based on research studies sponsored by the NHLBI, is an example of such an approach.

Counting Calories

To lose weight, calories expended must exceed calories taken in. To lose 1 pound per week, one must have a deficit of 500 kcal/day. Often, this can be achieved by a diet of 1,000–1,200 kcal/day for women and 1,200–1,600 kcal/day for men.⁵⁶ Selecting whole grain products for carbohydrates, reducing soda and juice, moderating alcohol, and increasing water consumption are other steps that can help.

Skipping Meals

Patterns of food consumption may also influence rates of obesity. While patients who stringently fast and decrease their caloric intake as a method of weight control do indeed lose weight, skipping meals, especially breakfast, results in bingeing and metabolic changes that may increase fat deposition. People who skip breakfast have higher rates of obesity and eating breakfast is associated with successful weight loss maintenance. Breakfast skippers tend to eat excessively at the next meal, or succumb to snacking on high-calorie food to stave off hunger. Late night snacking may also lead to increased weight gain. Several studies also suggest that people tend to add more body fat when they eat fewer, larger meals than when they eat the same number of calories in smaller, more frequent meals.

Sleep hygiene

Multiple studies of sleep duration and weight gain, particularly in children, have reached the same conclusion—short sleep duration is associated with subsequent weight gain. Indeed, the Institute of Medicine recently recommended the promotion of age-appropriate sleep durations as a primary goal in the prevention of childhood obesity.

Patient's Long-Term Commitment

Commitment to change is essential, but need not occur overnight. In fact, gradual change is more likely to be sustainable. Keeping track of dietary intake increases awareness of what a person is eating and problem in eating patterns. Support is indispensable. Congratulate and reward patients' successes, comfort them when they have setbacks, and encourage them to keep trying.

COUNSEL ON PHYSICAL ACTIVITY

Although exercise alone is not enough to cause substantial weight loss, in some studies it has resulted in greater weight loss than diet alone. Additionally, regular physical activity is essential in prevention of weight regain. The benefits of exercise include increased cardiovascular fitness, lower blood pressure, increased lean body mass, boosts in energy, stress relief, and improved sleep. Joining

a gym or jumping right into a rigorous exercise program is unappealing and unwise for most seasoned couch potatoes. It is important to start slowly. Using everyday activities to increase exercise is an easy first step: taking the stairs instead of the elevator, getting off the bus a stop early and walking the extra blocks, or exercising while watching television. Without costly memberships or a significant time commitment, these steps can significantly increase physical activity when done consistently.

Exercise can be incorporated into family life, both increasing health and fostering bonding. Families can take walks after dinner or take classes together. Children should be encouraged to participate in after-school programs or extracurricular activities in which they can be physically active. Parents can serve as role models for good health behaviors by being physically active.

ADDITIONAL RESOURCES TO AID DIET COUNSELING

Providers can use many resources to aid in diet counseling efforts. Dietitians educate patients in healthy eating behaviors and can provide detailed patient-specific advice. Unfortunately, depending on regional variations and insurance coverage, patients may have difficulty accessing these services. Books and Web-based information are more widely accessible (see Resources).

Smart phone apps are an increasingly used resources. Apps can allow a user to easily count and track caloric intake, find healthy eating options based on GPS locations, and easily access healthy recipes.

A review of commercial weight loss programs found little data to support their use based on efficacy and cost-effectiveness.⁵⁷ The sole exception was Weight Watchers, which resulted in a modest weight reduction, but more weight loss at 2 years than a self-help group that received minimal structured education.⁵⁸

PHARMACOTHERAPY FOR WEIGHT LOSS

Both patients and health-care providers alike seek the “miracle weight loss pill.” Unfortunately, none of the past prescription weight loss medications (phentermine and orlistat) has proven to be miraculous in its effects. New FDA-approved medications (lorcaserin and phentermine/topiramate) show some promise,⁵⁹ but more time and use will be needed to fully appreciate efficacy and side effects. Although FDA-approved weight loss medications are worth considering in the management of obesity, their cost, which ranges from \$60 to \$200 per month can be prohibitive for resource-poor individuals.

Who should receive weight loss medications? Guidelines have been established to aid practitioners with the appropriate use of weight loss medications.⁶⁰ Information

Table 37-2. Weight Loss Medications

Medication	Mechanism	Side Effects	Use in Children	Dosing	Initial Effect	≈ Cost
Phentermine (Adipex)	Sympathomimetic amine: appetite suppression	Dry mouth, insomnia, transient increase in blood pressure and heart rate	Adolescents 17 years and older	30 mg daily	7.9 kg weight loss > placebo	\$60/month
Orlistat (Xenical)	Lipase inhibitor: decreased fat absorption	GI: flatus, incontinence, bloating Impaired vitamin absorption	Ages 12 and older	120 mg TID with meals	3.4 kg weight loss > placebo, 6.9% weight loss at 4 years	\$120/month
Lorcaserin (Belviq)	Serotonin-2C receptor agonist: appetite suppression	Headaches, dizziness, dry mouth	Not approved for children	10 mg BID	5% weight loss, 3% > placebo	\$150/month
Phentermine/Topiramate (Qsymia)	Sympathomimetic amine: appetite suppression Unclear mechanism	Paraesthesia, dizziness, insomnia, dry mouth	Not approved for children	7.5/46 mg daily 15/92 mg daily	8% weight loss 10% weight loss	\$160/month
Naltraxone SR/Bupropion SR (Contrave)	Opioid antagonist: Unclear mechanism	Dopamine reuptake inhibitor: appetite suppression—Nausea, dizziness, headache, dry mouth, increase in blood pressure, constipation	Not approved for children	6/180 mg BID	10% weight loss	\$200/month

Source: Adapted from Bray and Ryan,⁵⁹ Gadde et al,⁷² Fidler et al,⁷³ Ornellas et al⁷⁴

about medications currently on the market is included in Table 37-2. Weight loss medications always should be given in addition to behavioral therapy (diet and exercise). Their use can be considered in patients with a BMI of 27 and comorbidities (e.g., hypertension, diabetes, hyperlipidemia, obstructive sleep apnea), or a BMI ≥ 30 .

In addition to FDA-approved medications designed specifically for weight loss, there are medications used for other chronic conditions that have sometimes beneficial side effect of weight loss. These should be considered in patients who have obesity and another relevant condition: metformin for patients with diabetes, topiramate for patients with migraines/chronic headaches, and bupropion for patients with depression.

BARIATRIC SURGERY FOR WEIGHT LOSS

Bariatric surgery is the most invasive as well as the most effective method available to assist patients with weight loss. In general, the goal of bariatric surgery is to decrease the size of the stomach to limit the intake of food and decrease the absorption of foods eaten. There are many types of bariatric procedures. The two most commonly used by US surgeons are the Roux-en-Y gastric bypass and the sleeve gastrectomy.

CANDIDATES FOR BARIATRIC SURGERY

Patients can lose between 20 and 40 kg through bariatric surgery.⁶¹ Health outcomes for patients who undergo bariatric surgery have been well established. Improvements or resolution of high blood pressure, diabetes, high cholesterol, sleep apnea, and musculoskeletal symptoms are expected after successful weight loss from bariatric procedures.⁶²

Regarding children, several pediatric hospitals around the country began performing bariatric surgery in morbidly obese adolescents who have reached skeletal maturity and who have comorbid conditions that would benefit from sustained weight loss. It is generally recommended that adolescents considering bariatric surgery seek care in a well-established pediatric obesity center.⁶³

The average cost of bariatric surgery is \$15,000–\$25,000 depending on the procedure (www.obesitycoverage.com). Some insurance providers, including Medicaid and Medicare, cover the surgery if it is deemed a medical necessity and the NIH criteria outlined in Box 37-3 are met; however, for low-income individuals without insurance who are often medically eligible for the procedure, the cost of surgery can be prohibitive. This barrier to access creates a new area of health inequity in vulnerable populations.⁶⁴

POSTOPERATIVE COMPLICATIONS AND CARE

There are several common post-bariatric surgery complications. The most common complications are iron and

Box 37-3. Who Is a Candidate for Bariatric Surgery?

- Have had obesity for at least 5 years
- Have a BMI >40 kg/m² or >35 kg/m² with two comorbid conditions that would benefit from weight loss (e.g., hypertension, diabetes, hyperlipidemia, steatohepatitis, coronary artery disease, obstructive sleep apnea)
- Have failed medically supervised nonsurgical methods of weight loss
- Have no significant psychopathology

From Collazo-Clavell ML. Safe and effective management of the obese patient. *Mayo Clin Proc* 1999;74:1255-1259.⁶⁵

B₁₂ deficiencies. Consequently, providers should follow a patient's CBC and iron profile every 3 months for a year and then yearly and should provide appropriate supplementation. Osteoporosis can occur in post-bariatric surgical patients. Its cause is unclear, although it may involve the impaired absorption of calcium and vitamin D. Primary care providers should consider evaluating patients for osteoporosis and treating them with calcium and vitamin D when necessary.⁶⁶ Gallstone formation (cholelithiasis) is a common occurrence after major weight loss of any kind; therefore, it is particularly common in patients who undergo bariatric surgery. In addition to close medical monitoring, patients should be involved in a postoperative program to assist with weight loss maintenance. For many patients, the changes in diet and eating patterns (small frequent meals) can be quite different from their usual eating styles or those of their families.

MULTIDISCIPLINARY AND INTERDISCIPLINARY APPROACHES TO WEIGHT CONTROL

Esmeralda is referred for psychiatric evaluation and her family is assigned a case manager. A dietitian and physical therapist help design plans for the family. Esmeralda receives an excuse for not taking swimming at school because of her refusal to wear a bathing suit in front of other students. However, she agrees to take part in other physical activities that do not require exposing her body.

Social, biological, and psychological factors interact in the development of obesity; therefore, a team approach may be necessary to cope with this multifactorial problem. For some patients with longstanding relationships with primary care providers, evaluating the contributing factors and giving suggestions to alter those factors may be all that is required to affect healthy changes. However, for other patients who may not receive regular medical care

or have complicated medical and social issues, multidisciplinary or interdisciplinary treatment can be an effective way to manage weight issues.

In the era of the Chronic Care Model and patient-centered medical care, team approaches to care that include the patient have improved outcomes for a variety of medical conditions including several related to excess weight.^{67,68} The necessary components of a weight loss treatment program should address social (financial resources, food security, neighborhood safety), biological (comorbid conditions related to obesity), behavioral (readiness for change, confidence, self-efficacy), and psychological (depression, anxiety) factors. Therefore, clinic redesign with a multidisciplinary team might include clinicians (physicians, nurses, dietitians, behavioral therapists, physical therapists) and nonclinicians (social workers, health educators, behavioral therapists, community partners). For a variety of reasons—cost, transportation, time—the more team members who can connect with a patient during a single visit, the more likely multiple aspects of care will be appropriately addressed. Multidisciplinary clinics or interdisciplinary group classes and visits may be useful in this regard (see Chapters 16 and 19).

PUBLIC HEALTH AND POLICY APPROACHES TO WEIGHT CONTROL

Although individual approaches to weight loss serve to improve a single person's health, larger public health approaches can effect change on a population level. Many health-care providers are motivated to advocate for change outside of the clinical setting because strong recommendations for healthy living are often overwhelmed by the obesogenic environments in which patients live. Public health and health policy initiatives in a variety of settings can promote and support healthy lifestyle behaviors in large numbers of people regardless of income, educational status, and ethnicity.

Community-based approaches include considering fitness and physical activity in the design of cities, neighborhoods, and buildings (the built environment): creating reliable and well-integrated mass transportation systems; equipping office and commercial space with well-lit, easily accessible stairs; or designing neighborhoods with sidewalks and trails for biking and walking. In already established communities, local governments can make funding for recreational centers, green space, bike lanes, and safe playgrounds a priority. Employers can provide on-site exercise facilities or incentives for their employees to join fitness centers or take classes promoting healthy behaviors. The education of key community figures, such as religious leaders, medial personalities, and high-profile public personalities (e.g., First Lady Michelle Obama) can serve to disseminate health messages in an efficient and effective manner. Furthermore, partnerships among

academic medical centers, community organizations, and local governments can facilitate the creation, implementation, and evaluation of the impact of public health efforts targeting obesity.

Schools are particularly important places for healthy behavior initiatives. In 2012, the United States Department of Agriculture (USDA) released new school lunch standards that require an increase in fruits and vegetables, whole grains, and a reduction in sodium in the food they serve. These changes touch millions of children who rely on schools for most of their weekly food consumption. In 2013, the USDA released vending machine standards that promote healthier snack options on US school campuses. In addition to these food policies, schools are an excellent location to teach children about physical activity, healthy eating, and healthy food preparation. Educational initiatives such as age-appropriate and culturally sensitive nutrition classes should be required in schools. Teachers, support staff, and parents should be educated on the benefits of proper nutrition and physical activity—even in short bursts. Reinstating recess and physical education classes in schools and encouraging participation in extracurricular activities that involve sustained movement—including nontraditional ones such as Zumba, line-dancing, or traditional cultural dancing—can reinforce the importance of physical activity. Lastly, health promotion messages can take the place of fast food and soft drink advertising near school grounds.

Federal policy initiatives such as those enacted by the USDA can have a significant impact on obesity. Likewise, within the Affordable Care Act is a provision that chain restaurants with 20 or more locations must post calorie content on their menu boards in letters of comparable size as the price. Once this policy is fully implemented, health-care providers will be able to coach patients on appropriate calorie counts for their meals. Other more broadly focused policy considerations include the development and use of simplified nutritional rating scales (1, 2, or 3 stars based on nutritional profile) that would be used by grocery stores to simplify the process selecting the healthiest products for purchase⁶⁹ and taxation of sugar or sugar-sweetened beverages.⁷⁰

Voluntary industry policies can also reach millions. In 2012, Walt Disney Co. agreed to limit junk food advertising on Disney television, radio, and online programs targeting children younger than 12 years. Fast food and soft drink advertising could be prohibited during all children's television programs. Taxes could be levied on fast food and other unhealthy snacks, whereas fruits and vegetables and healthy food options could be subsidized. Also, the food and beverage industry could be required to provide reasonable portion sizes in restaurants.⁷¹ Government subsidies for growing corn (corn syrup) and sugar could be eliminated or transferred to support the growth of fruits and vegetables.

These nonclinical, wide-scale approaches to the promotion of healthy eating and physical activity have the potential to enhance and support the targeted work done by clinicians with patients.

CONCLUSION

Over one half of US adults and nearly one-third of children are overweight or obese. Weight loss can be an extremely difficult process. Time commitments, the cost of healthy foods, limited opportunities for physical activity, and lack of awareness of the negative effects of obesity can all be barriers to weight loss. Health-care providers have an opportunity to assist patients with this important health issue through care of their individual patients and support of community and public health initiatives. Together with health-care providers and patients, large-scale efforts will help reverse the trend of ever-increasing rates of obesity.

KEY CONCEPTS

- Identify obesity in patients.
- Calculate BMI.
- Explicitly address the issue of obesity.
- Motivate patients to lose weight.
- Consider cultural norms and time constraints specific to individual patients and their families.
- Set realistic goals.
- Counsel on diet and physical activity modifications.

CORE COMPETENCY

Action Plan for Weight Loss

Pre-Action Plan

- Provide an accurate weight assessment.
- Assess readiness for change.
 - Precontemplators:
 - Counsel weight maintenance.
 - Review the health consequences of obesity.
 - Assess confidence in ability to change and importance of need to do so.
 - Contemplators
 - Tip the balance: strengthen reasons for weight loss.
 - Assess confidence and importance.

Action Phase: Make the Action Plan

- Have patient identify *his or her* reasons for weight loss.
- Brainstorm on achievable goals: *Walk 10 extra minutes a day three times a week; drink diet soda instead of regular soda.*
- Identify desirable, nonfood rewards as motivation to achieve goals.
- Outline a dietary plan: *"I will eat breakfast every day." "I will restrict eating out to once weekly."*

- Outline a physical activity plan: *"I will park at the far end of the parking lot at the grocery store," "I will play soccer with my children on Saturday mornings."*
- Review additional supportive resources (nutritionist referral, weight loss medications, family counseling, etc.).
- Brainstorm on ways for the patient to keep weight off once it has been lost.

DISCUSSION QUESTIONS

1. Discuss three of the many factors that make it difficult for you or someone you know to lose weight. How might you overcome those difficulties?
2. Describe the steps a health-care provider should take to help a patient lose weight.
3. Esmeralda's mother has been your patient for 5 years. She happily reports to you that her both daughters have been losing weight over the last year. Your medical record shows that she has gained 5 pounds in the last year and her diabetes control has worsened (HbA_{1C} has risen from 7.5 to 9.0). Describe how you might approach your patient's weight gain.

RESOURCES

Weight-Control Information Network: A Web site produced by NIH and the National Heart, Lung, Blood Institute to assist patients and providers with weight loss. <http://win.niddk.nih.gov>.

A Web site with information for African-American women regarding BMI, physical activity, nutrition, and weight loss goals. <http://www.blackwomenshealth.com>.

A Web site by the USDA that allows individuals to learn how to balance their plate, to eat on a budget, and know the calories of common foods. www.ChooseMyPlate.gov.

An electronic guide to recent, high-quality resources and information tools for overweight in children and adolescents. <http://www.mchlibrary.info/knowledgepaths>.

BMI calculator. <http://www.cdc.gov/nccdphp/dnpa/bmi/calc-bmi.htm#English>.

REFERENCES

1. Rahman M, Berenson AB. Accuracy of current body mass index obesity classification for white, black, and Hispanic reproductive-age women. *Obstet Gynecol* 2010;115(5):982-988.
2. Calle EE, Thun MJ, Petrelli JM, Rodriguez C, et al. Body-mass index and mortality in a prospective cohort of U.S. adults. *N Engl J Med* 1999;341(15):1097-1105.
3. Patel AV, Hildebrand JS, Gapstur SM. Body mass index and all-cause mortality in a large prospective cohort of white and black U.S. adults. *PLoS One* 2014;9(10):e109153.