
9. Obesity

Obesity significantly increases the risk of developing type 2 diabetes, and the health consequences of obesity are more severe among patients with diabetes. In particular, central obesity is independently associated with insulin resistance and increased cardiovascular risk.

Classification of Obesity

Body mass index (BMI) is used to classify obesity (**Table 9-1**). BMI is calculated by dividing a patient's weight in kilograms by the square of the height in meters (kg/m^2). The BMI can be misleading in very muscular persons, who may have a high BMI but will not necessarily be obese, and those who have lost significant muscle mass, who may have a low BMI but are obese. A chart for calculating and interpreting BMI is included (*Body Mass Index Table*) in Chapter 9 of the *Diabetes Care Guide Toolkit*. In addition, a BMI calculator is provided on the accompanying CD-ROM and on the ACP Diabetes Portal (<http://diabetes.acponline.org>).

The first steps in the treatment of obesity and the cornerstones of ongoing weight management are counseling on dietary and behavioral modification (exercise) and establishing individual goals for weight loss and the management of comorbidities. According to the ACP practice guidelines for the management of obesity, pharmacotherapy may be considered if goals are not met with diet and exercise. Bariatric surgery is a treatment option for patients with a BMI >40 (morbidly obese) and with obesity-related comorbidities who have not succeeded with diet and exercise regimens. **Figure 9-1** summarizes the ACP 2005 clinical practice guidelines for management of obesity.

Helping Your Patients Lose Weight


How can I help my overweight or obese patients lose weight?

Lifestyle changes, including regular exercise and caloric reduction, are the first steps in the management of obesity and remain the foundations of therapy, even when additional treatment for obesity is begun.

- Measure the patient's BMI and waist circumference and inform him or her of the results. (Waist circumference should be measured just above the iliac crests, with the tape measure pulled snugly around waist.) Women with a waist circumference of 35 inches or more and men with a waist circumference of 40 inches or more are at higher risk of developing diabetes.
- Assess the patient's readiness to lose weight, including:
 - Reasons and motivation for weight loss;
 - Previous attempts at weight loss;
 - Support from family and friends;
 - Understanding of the risks and benefits of weight loss;
 - Attitudes toward physical activity;
 - Potential barriers to losing weight;
 - On a scale of 1 to 10, the level of importance placed on weight loss and the patient's confidence in the ability to succeed.
- Help the patient set realistic weight loss goals and specific diet and physical activity strategies (**Table 9-2**). *Setting Your Self-Management*

Table 9-1. World Health Organization Classification of Body Weight

| Body Mass Index | Classification |
|-----------------|--------------------------------|
| <18.5 | Underweight (thin) |
| 18.5-24.9 | Normal |
| 25-29.9 | Pre-obese (overweight) |
| 30-34.9 | Class 1 obese |
| 35-39.9 | Class 2 obese |
| >40 | Class 3 obese (morbid obesity) |

 *Goal and Your Self-Management Workbook* in Chapter 2 of the *Diabetes Care Guide Toolkit* can help patients with goal setting.

- Recognize that to successfully lose weight, patients need ongoing support and follow-up. Offer referral to a registered dietitian and have a list of local weight loss programs and support services when referring patients seeking to lose weight.

The National Institutes of Health's *Practical Guide to Identification and Treatment of Overweight and Obesity in Adults* provides a step-by-step guide to the management of overweight and obese patients, including an appendix of patient handouts and self-management tools related to diet, physical activity, and behavioral modification. This full guide is available at www.nhlbi.nih.gov/guidelines/obesity/prctgd_b.pdf.

How can I help my patients incorporate more exercise into their lives?

Exercise does not have to be strenuous to provide benefits. Patients of all ages can benefit by gradually incorporating more physical activity into their lives—even a little bit of physical activity is better than none. Ask your patients who do not currently engage in regular exercise to think of one thing they are interested in and willing to do to begin to incorporate a few minutes of increased physical activity into each day. For example, as part of a short-term, specific action plan, patients can try to walk 10 minutes after lunch three times a week. Help patients identify the activities that they would like to try and that fit into their lives. Patients may

not realize that even ordinary tasks, such as gardening, playing with grandchildren, and housework, entail moderate physical activity. They may not realize that recreational activities, such as dancing or golf, are excellent ways of getting exercise.

In addition, goals must be realistic. Reaching a targeted, realistic goal will increase patients' self-confidence and may enable them to gradually build up to more minutes of physical activity and more intensive physical activity.

The Centers for Disease Control and Prevention currently recommends the following targets:

- Moderate-intensity physical activities: ≥ 30 minutes on 5 or more days each week *or*
- Vigorous-intensity physical activity: ≥ 20 minutes on 3 or more days each week

Additionally, many experts recommend that persons with diabetes who are planning to begin a vigorous exercise program (more intense than brisk walking) should first undergo cardiac stress testing, although no definitive evidence supports this recommendation.

Dietary Interventions

To achieve weight loss, quantitative caloric reduction must accompany qualitative changes in food intake. The Joslin Diabetes Center has developed evidence-based guidelines for weight reduction in obese and overweight patients with diabetes. These include:

1. Structured lifestyle plan that combines dietary modification and exercise;
2. Modest and gradual weight reduction (0.5 kg [1 lb] every 1–2 weeks);
3. Daily caloric reduction of 250–500 calories, with total caloric intake not less than 1000–1200 calories/day for women and 1200–1600 calories/day for men;
4. Individualized weight reduction program to achieve target BMI (18.5–25.0 or agreed-upon goal);

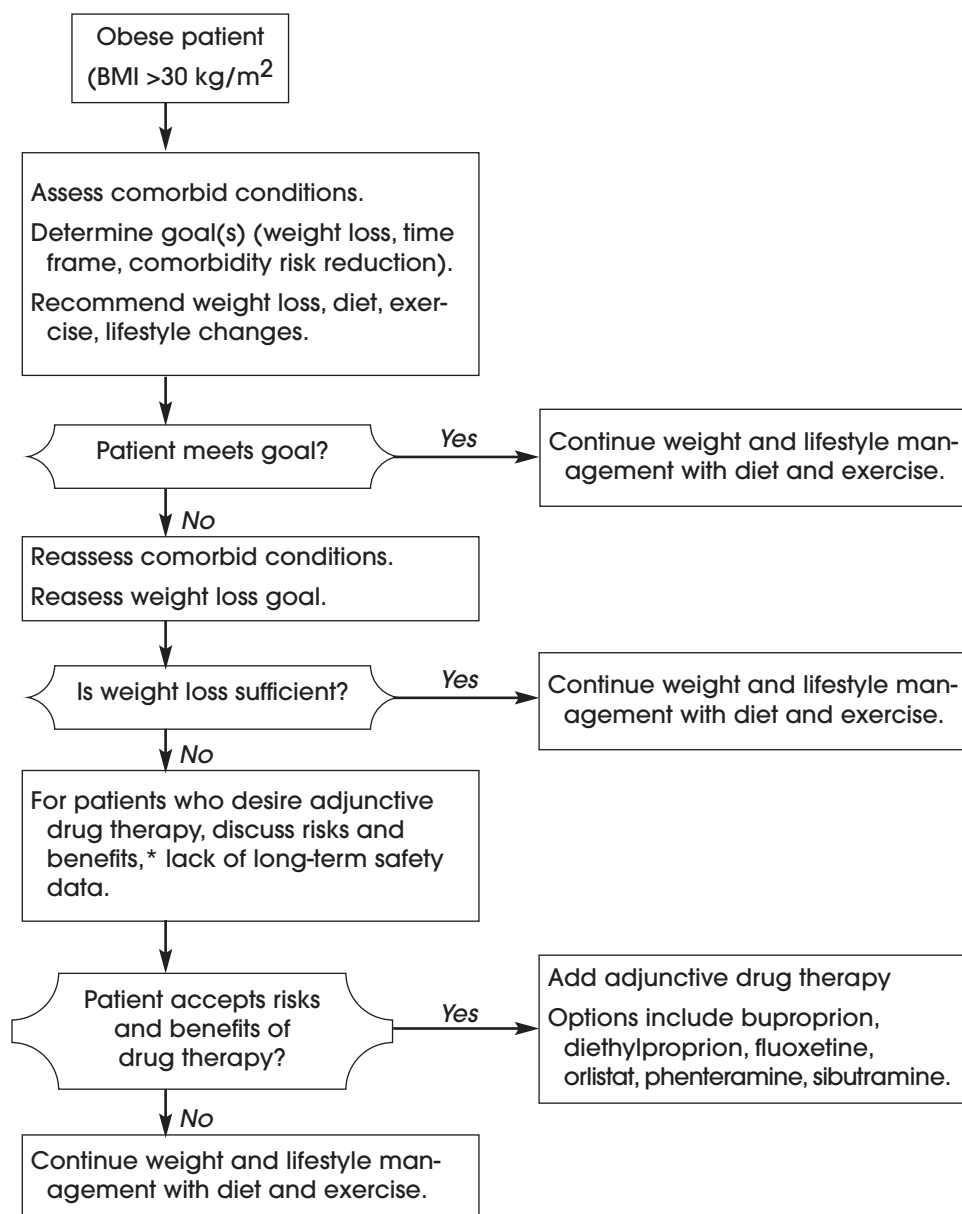


Figure 9-1 Managing Obesity

BMI = body mass index. *Assess side effects and efficacy; no data are available past 12 months except for orlistat.

Adapted with permission from Snow V, Barry P, Fitterman N, Qaseem A, Weiss K. Pharmacologic and surgical management of obesity in primary care: a clinical practice guideline from the American College of Physicians. *Ann Intern Med.* 2005;142:526.

5. Regular follow-up with a registered dietitian to learn and practice portion control.

In addition, the Joslin guidelines advise replacing refined carbohydrates and processed grains with low-glycemic index foods, avoiding severe carbohydrate restriction, limiting saturated fat intake, and including adequate protein in the

diet. **Table 9-3** summarizes these dietary composition recommendations.

All patients with diabetes (particularly those on insulin or insulin secretagogues) who plan to make significant quantitative or qualitative changes in their diet must discuss these changes with their physician to reduce the risk of hypoglycemia. Blood glucose records need to be monitored weekly, and blood pressure and lipid levels need to be followed regularly.

Liquid meal replacements marketed to persons with diabetes are available over the counter, including Boost Glycemic Control, Boost Diabetic, Sugar Free Slimfast, and Glucerna. Patients use them with or without the advice of a physician. Very-low-calorie diets (<800 calories/day, available commercially as powders) should only be used if patients are under the close supervision of a physician. Low-calorie diets in combination with regular physical activity should be attempted before initiating a very-low-calorie diet. These diets are contraindicated in patients with cardiovascular, renal, or hepatic disease; type 1 diabetes; protein-wasting diseases; and cancer. Persons with psychiatric disease or a history of an eating disorder should also not follow a very-low-calorie diet.

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Table 9-2. Recommended Options for Weight Loss

Caloric Intake

Moderate decreases in caloric intake (e.g., 500–1000 calories/day) will result in slow but progressive weight loss. Diets low in fat (~30% of calories) and saturated fat (<10% of calories) are recommended to reduce cardiovascular risk in obese patients.

Dietary guidance should be individualized and allow for patient food preferences and approaches to reduce caloric intake. Very-low-calorie diets (<800 calories/day) are only recommended with appropriate medical supervision and monitoring. Reducing portion sizes, selecting low-calorie foods, and using cooking methods that reduce fat intake can decrease overall caloric intake.

Physical Activity

Developing a regular pattern of exercise is central to successful long-term weight loss.

Lifestyle physical activity can be effective in producing weight loss, changing body composition, and improving risk factors for cardiovascular disease.

30–45 minutes of moderate-level physical activity is recommended 3–5 days per week initially. (Gradually, duration and frequency should increase.)

Physical activity does not need to occur in a single session to be beneficial.

Exercise programs should be determined by patient preferences, experience, physical abilities, and access to facilities.

Behavior Modification

Self-monitoring: Observe and record target behaviors.

Stimulus control and stress management: Identify and modify cues that promote overeating or inactivity. Manage stress that can trigger overeating and lead to relapse.

Rewards: Identify desirable and timely rewards that reinforce achievement of specific goals.

Cognitive restructuring: Increase awareness of internal dialogue and negative perceptions of self; develop positive “self-talk.”

Social support: Include others in weight loss plans to provide encouragement.

Adapted with permission from: Pi-Sunyer FX, Daly AE, Funnell MM, Heber D, Kushner R, Rubin RR, et al, eds. Clinical Management of Obesity: With Special Attention to Type 2 Diabetes. Alexandria, Va.: American Diabetes Association; 2004. Copyright © 2004 American Diabetes Association.

How can I help my patients develop healthier eating habits?

As with physical activity, ask your patients to think of one thing they are interested in and willing to do to improve their eating habits (for example, eating one additional vegetable serving a day). Discuss the nutritional guidelines below with your patients.

- Eat more fruits and vegetables, legumes, and whole and minimally processed grains. Carbohydrates should make up about 40% of daily caloric intake.
- The “plate method” is a convenient way for some patients to monitor the amounts and proportions of carbohydrates, proteins, and nonstarchy vegetables in their diets. (See Chapter 5, Helping Patients Make Lifestyle Changes.) In addition, *Rate Your Plate* in Chapter 5 of the *Diabetes Care Guide Toolkit* is a handout that patients can use to quickly assess the nutritional value of their meals.

- Limit refined carbohydrates such as pasta, white bread, and low-fiber cereal. (A minimum of 20–35 grams of fiber per day is recommended.)
- Eat mono- and polyunsaturated fats (e.g., olive oil, canola oil, nuts/seeds, and fish, particularly those high in omega-3 fatty acids). Oily fish twice per week, such as salmon, herring, lake trout, sardines, and albacore tuna, is an ample source of omega-3 fatty acids.
- Foods high in dietary cholesterol, such as egg yolks, red meat, whole-fat dairy foods, and organ meats, should be limited.

Which patients are candidates for weight loss pharmacotherapy or surgery?

Pharmacologic Approaches to Weight Loss

If a trial of diet and exercise is not successful, pharmacotherapy may be appropriate. The U.S. Food and Drug Administration and the National Heart, Lung, and Blood Institute both consider

Table 9-3. Dietary Composition Recommendations for Obese or Overweight Adults with Type 2 Diabetes*

| Dietary Component | % of Caloric Intake | Daily Intake | Notes |
|--|-------------------------------------|---|--|
| Carbohydrates | ~40% | Not less than 130 g daily | Low-glycemic index foods (oats, barley, whole grains, fruits, legumes) should replace refined carbohydrates (potatoes, white bread). |
| Fiber | | 25–30 g daily initially; if tolerated, up to 50 g daily | Preferably from fruits and vegetables. Fiber supplements if needed. |
| Fat Saturated Polyunsaturated Monounsaturated | ~30%–35% <10%† 10% 15%–20% | | Mono- and polyunsaturated fats include olive and canola oil, nuts/seeds, oily fish (salmon, herring, trout, sardines, fresh tuna). Saturated fats are found in pork, beef, lamb, high-fat dairy products. Fast food and commercially baked foods are high in trans fats and should be avoided. |
| Cholesterol | | <300 mg daily† | Limit egg yolks, red meat, whole fat dairy foods, shellfish. |
| Protein | 20%–30%‡ | | Protein should come from lean meats, low-fat dairy products, or tofu/tempeh/seitan products rather than from high-saturated fat animal sources. Protein is associated with increased satiety and can help maintain lean body mass during weight reduction. |

Adapted with permission from: Joslin Diabetes Center. Clinical nutrition guideline for overweight and obese adults with type 2 diabetes, prediabetes, or who are at high risk for developing type 2 diabetes. Copyright © 2005. Available at: www.joslin.org/managing_your_diabetes_joslin_clinical_guidelines.asp. Accessed 3 October 2006.

*Any meal plan modifications should first be discussed with a registered dietitian (RD) or a qualified health-care provider. The diet composition, described above, is for general guidance only and may be individualized by the RD or health-care provider according to clinical judgment.

†In persons with an LDL cholesterol level >100 mg/dL, saturated fat should be <7% of total daily caloric intake and cholesterol intake should be <200 mg/day.

‡Persons with a glomerular filtration rate <60 mL/min should consult with a nephrologist before increasing protein in their diet.

pharmacotherapy appropriate for persons with a BMI >27 who have significant comorbidities—including diabetes, hypertension, and dyslipidemia—and those with a BMI >30 regardless of comorbidities. A 6-month trial of diet and exercise should be attempted first. Medications approved for the treatment of obesity work by suppressing appetite or inhibiting lipase. Several medications used for weight loss are listed in **Table 9-4**. Only sibutramine and orlistat are approved for long-term use. The patient and physician must discuss medication side effects and safety data, as well as the fact that weight loss achieved through pharmacotherapy is often not sustained.

Contraindications to pharmacotherapy for obesity are as follows:

- Pregnancy or lactation (pregnancy test should be done before prescribing)

- Unstable cardiac disease
- Uncontrolled hypertension (systolic blood pressure >180 mm Hg or diastolic blood pressure >110 mm Hg)
- Severe systemic illness (e.g., cancer)
- Psychiatric illness
- History of an eating disorder
- Concomitant use of monoamine oxidase inhibitors, migraine medications, or other adrenergic medications

Surgical Approaches to Weight Loss

The National Heart, Lung, and Blood Institute considers bariatric surgery an option for persons with a BMI >40 and no comorbidities or a BMI

Table 9-4. Medications Used for Weight Loss

| Drug | Mechanism of Action | Side Effects |
|------------------|--|--|
| Sibutramine*† | Appetite suppressant: combined norepinephrine and serotonin reuptake inhibitor | Modest increases in heart rate and blood pressure, nervousness, insomnia |
| Phentermine*† | Appetite suppressant: sympathomimetic amine | Cardiovascular, gastrointestinal |
| Diethylpropion*† | Appetite suppressant: sympathomimetic amine | Palpitations, tachycardia, insomnia, gastrointestinal |
| Orlistat* | Lipase inhibitor: decreased absorption of fat | Diarrhea, flatulence, bloating, abdominal pain, dyspepsia |
| Bupropion | Appetite suppressant: mechanism unknown | Paresthesia, insomnia, central nervous system effects |
| Fluoxetine | Appetite suppressant: selective serotonin reuptake inhibitor | Agitation, nervousness, gastrointestinal |
| Sertraline | Appetite suppressant: selective serotonin reuptake inhibitor | Agitation, nervousness, gastrointestinal |
| Topiramate | Mechanism unknown | Paresthesia, changes in taste |
| Zonisamide | Mechanism unknown | Somnolence, dizziness, nausea |

*Approved by the U.S. Food and Drug Administration for weight loss.

†Drug Enforcement Administration schedule IV.

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of >35 with comorbidities. The ACP guidelines for bariatric surgery are somewhat narrower—BMI >40 with comorbidities. A patient being considered for bariatric surgery should have already tried diet and exercise. Patients must go through a rigorous screening process, including an assessment of social supports and willingness and ability to adhere to close medical follow-up. A discussion of the long-term side effects of surgery, including gallbladder disease, malabsorption, and the possible need for reoperation, must occur before surgical intervention. If surgery is planned, the ACP recommends referral to high-volume centers with surgeons experienced in bariatric surgery.

Surgical treatments of obesity include restrictive procedures (adjustable gastric banding or vertical banded gastroplasty) and procedures that produce malabsorption (Roux-en-Y gastric bypass, biliopancreatic bypass).

No randomized, controlled trials comparing surgical and medical management of morbid obesity are available. A large Swedish observational

study followed patients who underwent bariatric surgery and compared them with a weight-matched cohort that followed medical management. Surgically treated patients experienced sustained weight loss compared with medically treated counterparts. Because the surgically treated patients were self-selected, surgery cannot be viewed as superior to medical management for all patients. The incidence of hypertension, diabetes, and dyslipidemia were improved after 2 years in patients who underwent surgery, but not all of these improvements were sustained at 10 years.

Contraindications to surgery include psychiatric illness and substance abuse. Perioperative complications of surgery occur in approximately 10% of patients and include infection, leaks at the anastomosis site, and pulmonary embolus. As many as 25% of patients develop nutritional deficiencies, some of which are not reversible if discovered late. Patients must take vitamin and mineral supplements indefinitely following gastric surgery.

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