

Evidence shows that any diet that achieves a calorie deficit will produce weight loss. Those who choose low-fat options should be vigilant about the sugar and sodium contents of these products. Although general teaching is that calories are equivalent, calories listed on nutrition labels are measured in a calorimeter and may be processed differently physiologically; calories from sugar-sweetened sodas may not be processed in the same way as calories from leafy green vegetables. Patients should be advised to gradually consume more guideline-advised healthy foods, including fruits, vegetables, legumes, nuts, whole grains, fish, and lean meats (see Routine Care of the Healthy Patient). Patients should be advised to choose a diet that they will be most likely able to maintain and encouraged to find healthy foods they enjoy.

Very-low-calorie diets (<800 kcal/d) produce accelerated weight loss but require medical supervision. They should be reserved for situations requiring rapid weight loss, such as preparation for surgery.

Exercise

Lifestyle interventions should include moderate- to vigorous-intensity physical activity for at least 150 minutes per week and resistance training at least twice per week. Exercise does not contribute as much to initial weight loss as does reduced calorie intake, but long-term commitment to regular physical activity is important for maintaining weight loss and improving cardiovascular health. Because patients are often initially deconditioned, gradual progression may be required, and it should be emphasized that any physical activity is better than none.

Behavioral Therapy

The Centers for Medicare & Medicaid Services allow payment for "intensive behavioral weight loss counseling" by primary care providers. The content of this counseling in practice varies widely, as does its effectiveness. Using motivational interviewing techniques is encouraged (see Routine Care of the Healthy Patient). Specific components associated with increased effectiveness include a calorie deficit of at least 500 kcal/d, at least 150 minutes of moderate to vigorous physical activity per week, and the use of trained interventionists (nutritionists, behavioral therapists, or exercise therapists). Interventions should incorporate regular self-monitoring of weight using a scale and calorie intake as well as education on controlling or altering the environment to avoid excess calorie intake. Other interventions include removing calorie-dense snacks and beverages from the home and workplace or replacing them with lower-calorie options, and engaging in alternate behaviors (walking, chewing gum) in situations in which the patient might be tempted to eat.

High-intensity programs (≥ 14 sessions over ≥ 6 months) delivered by trained interventionists are associated with successful weight loss. Face-to-face interventions most reliably result in weight loss and have the largest effects on weight, but interventions delivered electronically or by telephone have

also shown success. Continued visits for at least 1 year after initial weight loss increase the chances of maintaining weight loss.

Pharmacologic Therapy

Pharmacotherapy is an option for patients with BMI of 30 or greater, or with BMI of 27 or greater and at least one obesity-associated comorbid condition who have not achieved weight loss goals with a trial of at least 3 to 6 months of lifestyle modification. Weight is typically regained once these medications are stopped and thus should be used alongside lifestyle modification. Pharmacotherapy is effective, but potential weight loss benefit should be balanced against risk for adverse events and cost.

Table 34 describes the mechanism of action, expected weight loss, and side effects of commonly used agents; all have demonstrated higher rates of achieving 5% or greater weight loss compared with placebo. Orlistat has the best long-term safety data and lowest rate of discontinuation due to side effects. Liraglutide and phentermine-topiramate produced the greatest weight loss but had higher rates of discontinuation due to side effects.

As with all other comprehensive weight loss interventions, patients should be monitored regularly. Patients who do not show weight reduction after 12 weeks of therapy should discontinue pharmacotherapy.

Patients are inundated with advertisements for over-the-counter weight loss supplements and devices, which may claim greater safety and effectiveness than prescription medications. For weight loss supplements, systematic reviews show little evidence of effectiveness. Moreover, some supplements may be associated with significant adverse effects. Ma huang/ephedra (ephedrine), for example, has been associated with myocardial infarction and stroke. Some weight loss supplements may also have additional undisclosed ingredients, most commonly sibutramine. Physicians should discuss the lack of effectiveness and potential for side effects of supplements during weight loss counseling and advise discontinuation. Commonly used herbal weight loss supplements and potential side effects can be found at <https://ods.od.nih.gov/factsheets/WeightLoss-HealthProfessional/> and https://medlineplus.gov/druginfo/herb_All.html.

Bariatric Surgery

Guidelines recommend surgery for patients with a BMI of 40 or greater or for those with a BMI of 35 or greater who have obesity-associated comorbid conditions. Bariatric surgery reliably results in weight loss and may also produce improvements in diabetes control, blood pressure, and lipid profiles. Cardiovascular and overall mortality may also be improved in patients with severe obesity.

The risks associated with bariatric surgery exceed those associated with nonsurgical treatments. Therefore, candidates for bariatric surgery should be selected carefully on the basis of risk-benefit analysis. Patients should have acceptable

TABLE 34. Medications for Weight Loss

Medication	Mechanism of Action	Weight Loss Versus Placebo at 52 Weeks in Meta-analysis of Randomized Controlled Trials	Common Side Effects (Odds Ratio for Discontinuation Versus Placebo)
Liraglutide (injectable)	GLP-1 receptor agonist; delays gastric emptying	5.2 kg (11.6 lb)	Gastrointestinal upset, headache, nasopharyngitis (2.82) Contraindications: MTC, MEN2, pregnancy
Naltrexone-bupropion	Opioid antagonist plus norepinephrine/dopamine uptake inhibitor; suppresses appetite	5 kg (10.9 lb)	Gastrointestinal upset, headache, dizziness, insomnia, dry mouth, tachycardia, hypertension, anxiety, tremor (2.60) Contraindications: opioid use or withdrawal, uncontrolled hypertension, history of seizures, eating disorder
Orlistat	Lipase inhibitor; decreases triglyceride absorption	2.6 kg (5.8 lb)	Oily stools, increased defecation, fecal urgency/incontinence (1.84) Contraindications: pregnancy, malabsorption syndrome, cholestasis
Phentermine-topiramate	Noradrenergic/GABA receptor activator and AMPA glutamate receptor inhibitor; suppresses appetite	8.8 kg (19.4 lb)	Paresthesias, dizziness, taste alterations, insomnia, constipation, dry mouth, tachycardia, cognitive changes (2.32) Contraindications: glaucoma, hyperthyroidism

AMPA = α -amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid; GABA = γ -aminobutyric acid; MTC = medullary thyroid carcinoma; MEN2 = multiple endocrine neoplasia type 2.

Data from Khera R, Murad MH, Chandar AK, et al. Association of pharmacological treatments for obesity with weight loss and adverse events: a systematic review and meta-analysis. *JAMA*. 2016;315:2424-34. [PMID: 27299618] doi:10.1001/jama.2016.7602

surgical risk, understand the necessity of lifelong dietary and lifestyle measures for sustained weight loss, and be willing to adhere to lifelong follow-up. Candidates should not have psychological or psychiatric conditions that impede adherence to these requirements.

Techniques

The most commonly performed bariatric surgical procedures are sleeve gastrectomy and Roux-en-Y gastric bypass. Sleeve gastrectomy has become the most common bariatric procedure in the United States. Sleeve gastrectomy is accomplished by excising the part of the stomach along the greater curvature, creating an approximately 85% reduction in size. It results in restriction of caloric intake via a smaller stomach and hormonal (glucagon-like peptide-1 [GLP-1] and related hormones) appetite suppression. The smaller gastric surface area also results in less production of ghrelin, an appetite stimulant.

Roux-en-Y gastric bypass involves detaching the proximal stomach and creating a small pouch, which is reattached to a limb of the small intestine. Weight loss results from decrease in caloric intake because of the small stomach pouch, malabsorption due to bypassing much of the stomach and proximal small intestines, and appetite suppression due to changes in GLP-1 and related hormones.

Gastric banding involves placement of a silicone fluid-filled band around the proximal stomach, creating a small stomach pouch with subsequent reduction in caloric intake by increasing satiety. Gastric banding has greatly fallen in popularity owing to modest efficacy and high rates of revision and has been largely replaced by sleeve gastrectomy.

All bariatric procedures result in loss of excess weight in the short term and up to 70% of excess weight with Roux-en-Y and 60% with sleeve gastrectomy at 2 years. Long-term (5-year) data are less robust but suggest sustained weight loss.

More recently, other surgical and nonsurgical procedures have been developed. These include restrictive procedures (endoscopic suturing or stapling in a manner that replicates sleeve gastrectomy), pills that expand in the stomach, devices intended to decrease caloric absorption (duodenal-jejunal liners), and intragastric balloons. Intragastric balloons are typically placed endoscopically and are FDA indicated in patients with BMI of 30 to 40 with one or more obesity-related comorbidities. These and other related techniques are less invasive and may carry less risk than surgical procedures, but more data on long-term outcomes are needed.

Postoperative Care

Rates of 30-day postoperative complications range from 1.3% to 8.7%. Complications include hemorrhage or leakage at the

anastomosis (bypass procedures) or staple line (sleeve gastrectomy), venous thromboembolism, and bowel obstruction. Anastomotic leaks usually occur within the first week and may present with nonspecific findings, including low-grade fever, tachycardia, and respiratory symptoms. Barium swallow or contrast-enhanced CT is recommended diagnostic testing when a leak is suspected; if suspicion is high and imaging is negative, surgical exploration should be considered.

Weight should be monitored closely in the early postoperative period. In patients with diabetes, sulfonylureas should be discontinued and insulin should be adjusted. As patients lose weight, frequent reassessment of medications is required.

Long-term postsurgical care focuses on preventing and identifying nutritional deficiencies, managing adherence to lifestyle modifications, and monitoring for behaviors that lead to weight regain. Vitamin D deficiency is universal in patients after bariatric surgery, leading to reduced intestinal absorption of calcium and phosphorus with resultant secondary hypoparathyroidism. Persistent secondary hyperparathyroidism can last for years after bariatric surgery, and annual monitoring of calcium, albumin, parathyroid hormone, and 25-hydroxyvitamin D levels is recommended. Annual monitoring of other nutrients, including vitamin B₁₂, folate, iron, and ferritin is often recommended (see Routine Care of the Healthy Patient). Other considerations for monitoring include thiamine, vitamin A, zinc, copper, and 24-hour urinary calcium. **Table 35** lists the anticipated nutritional deficiencies and recommended replacement strategies. **Table 36** describes post-bariatric surgery syndromes and their management.

KEY POINTS

- HVC** • Lifestyle modifications that are effective for the treatment of obesity include a calorie deficit of at least 500 kcal/d, at least 150 minutes of moderate to vigorous physical activity per week, and the use of trained interventionists (nutritionists, behavioral therapists, or exercise therapists).
- Pharmacologic therapy may be used as an adjunct to lifestyle modifications in patients with a BMI of 30 or greater or in patients with a BMI of 27 or greater who have overweight- or obesity-associated comorbid conditions.
- HVC** • Systematic reviews show little evidence that over-the-counter weight loss supplements are effective.
- Bariatric surgery should be reserved for patients with a BMI of 40 or greater or for those with a BMI of 35 or greater who have obesity-associated comorbid conditions.
- Long-term postsurgical care focuses on preventing nutritional deficiencies, managing adherence to lifestyle modifications, and monitoring for behaviors that lead to weight regain.

TABLE 35. Nutrient Deficiencies and Replacement After Bariatric Surgery^a

Nutrient Deficiency	Routine Replacement	Replacement Therapy if Deficient
Iron	Multivitamin with iron, or elemental iron 40-80 mg/d orally; take with vitamin C 500 mg/d	Ferrous sulfate 325 mg/d orally, or IV iron if oral is ineffective or not tolerated
Vitamin B ₁₂	Vitamin B ₁₂ 500 µg/d orally, or 1000 µg IM monthly	Vitamin B ₁₂ 1000 µg/d orally, or 1000 µg IM monthly
Folic acid	Multivitamin with folate For women of childbearing age, folate 1 mg/d orally	Folate 1 mg/d until replete, then 400-800 µg/d orally
Calcium	Calcium citrate 1200-1500 mg/d orally	—
Vitamin D	Vitamin D 400-1000 U/d orally	Vitamin D 50,000 U weekly orally for 3 mo, then reassess
Thiamine	Thiamine 50-100 mg/d orally	100 mg three times daily until symptoms resolve
Vitamin A	Multivitamin daily	Vitamin A 10,000 U/d orally with ongoing monitoring
Vitamin E	Multivitamin daily	Vitamin E 400 U/d orally
Vitamin K	Multivitamin daily	Vitamin K 10 mg/d orally
Copper	Multivitamin with minerals daily	Copper 2-4 mg/d orally
Zinc	Multivitamin with minerals daily, 15 mg/d	Zinc 220 mg/d orally
Selenium	Multivitamin with minerals	2 µg/kg/d if related cardiomyopathy

IM = intramuscularly.

^aSee Table 15. All medications and supplements should be in liquid, crushed, or chewable form for the 1-2 months after sleeve gastrectomy and for the first 3 months after Roux-en-Y gastric bypass.

Data from Marcotte E, Chand B. Management and prevention of surgical and nutritional complications after bariatric surgery. *Surg Clin North Am.* 2016;96:843-56. [PMID: 27473805] doi:10.1016/j.suc.2016.03.006

Men's Health

Male Sexual Dysfunction

Erectile Dysfunction

Erectile dysfunction (ED) refers to the inability to achieve or maintain an erection necessary for satisfactory sexual performance. The most common causes are vascular disease; neurologic disease, including stroke and postoperative nerve injury; medications; androgen deficiency; and psychological issues.