

The Hormone Foundation's Patient Guide to Endocrine and Nutritional Management After Bariatric Surgery

Bariatric (weight loss) surgery is a treatment option for people who are dangerously obese. But treatment does not end with the surgical procedure. All bariatric surgery patients need careful medical follow-up to reduce their chances of regaining weight and to ensure good management of other obesity-related health problems. Care after surgery is provided by primary care physicians, endocrinologists (doctors who specialize in hormone-related diseases and conditions), or gastroenterologists (doctors who specialize in diseases and conditions affecting the digestive system).

This guide for patients is based on The Endocrine Society's practice guidelines for physicians that focus on the care patients need immediately after surgery, as well as long-term management to prevent complications and weight regain.

How does bariatric surgery help weight loss?

Bariatric surgery procedures promote weight loss in one of three ways:

- Restriction, or limiting the amount of food you can eat before feeling full by reducing the size of the stomach.
- Malabsorption, or limiting the absorption of nutrients in the intestines by "bypassing" part of the small intestine (removing it from the path of food through the digestive tract).
- Combination of restriction and malabsorption.

What are the different bariatric procedures?

There are four operations commonly offered in the United States for weight loss.

- **Adjustable gastric banding (AGB).** In this restrictive procedure, an adjustable band is placed around the top of the stomach, creating a small pouch that holds only a little food. When the pouch is full, feelings of hunger go away and you are ready to stop eating even though you have had a small meal. Patients who have AGB lose less weight than those who have malabsorptive procedures. Weight loss depends on following a strict diet.
- **Roux-en-Y gastric bypass (RYGB).** RYGB is mainly a restrictive operation but also includes some malabsorption. Food intake is limited by stapling the stomach to create a small pouch. Absorption is somewhat limited by cutting and reattaching the small intestine so that the upper third of the small intestine is bypassed and the remaining portion is joined to the pouch.
- **Biliopancreatic diversion with duodenal switch (BPD-DS).** BPD-DS works by restriction and malabsorption.

It shortens the distance between the stomach and the colon (large intestine) even more than RYGB and causes more malabsorption. Most of the stomach is removed and a tube-like stomach (called a vertical gastric sleeve) is created. The sleeve remains connected to a very short segment of the upper small intestine, which is then directly connected to a lower part.

- **Vertical sleeve gastrectomy (VSG).** VSG reduces the size of the stomach, so it restricts food intake but doesn't decrease absorption by the intestines. VSG has mainly been performed as the first part of BPD-DS. However, recent studies suggest that some patients who undergo VSG lose weight with that procedure alone.

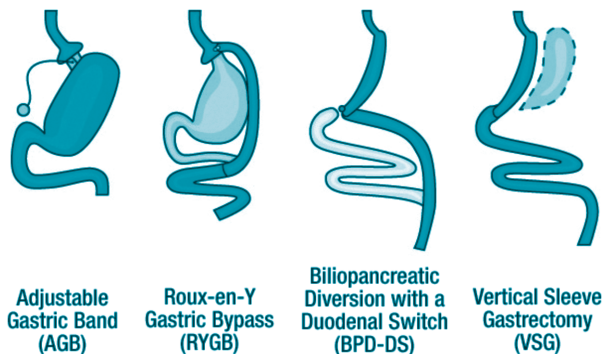


Image credit: Walter Pories, MD, FACS

How can weight regain be prevented or treated?

Preventing weight regain begins with realistic expectations about what bariatric surgery can do and what you have to do for yourself to lose weight and keep it off. While the surgery can help you limit the amount of food you eat, you must be ready to change lifestyle habits that led to weight gain. After surgery, you need to follow your doctor's nutritional recommendations and



To find an endocrinologist and obtain free publications, visit www.hormone.org or call 1-800-HORMONE.

exercise regularly (150 minutes per week of physical activity is recommended). Participation in a support group could help you stick with new habits. It's also important to keep follow-up medical appointments to monitor the effects of surgery.

How are postoperative nutritional deficiencies managed?

Because your body absorbs fewer nutrients after bariatric surgery, especially malabsorptive procedures, you need to keep a close eye on what you eat and make sure that you are getting all the nutrients your body needs for good health. You also need to see your doctor periodically for blood tests to monitor levels of macronutrients (protein, fats, carbohydrates) and micronutrients (vitamins, minerals, trace elements).



After bariatric surgery, obesity-related health problems disappear or greatly improve in most patients.

- Every three months for the first year, you should have blood tests to measure your blood count (to check for anemia), glucose (to check blood sugar levels), and creatinine (to check kidney function).
- Every six months for the first year, you should have blood tests to see if your body is lacking any specific nutrients (nutritional deficiencies) that could cause such problems as fatigue, weakness, loss of muscle mass, heart palpitations, depression, tingling sensations, bone disease, loss of night vision, or hypocalcemia (low levels of calcium in the blood).
- After the first year, you should repeat all of these tests annually.

Protein malnutrition is the most severe macronutrient complication of malabsorptive surgical procedures. You should consume an average of 60–120 grams of protein daily during weight loss and for the long term. Experts recommend daily multivitamin-mineral and calcium plus vitamin D supplements for all weight-loss surgery patients. If you have had a malabsorptive procedure, you may need to take additional supplements, such as vitamin B12 or iron, to prevent nutritional deficiencies.

Both weight loss itself and too little calcium and vitamin D can lead to increased risk of osteoporosis (brittle bones). If you had a malabsorptive procedure, you should have your blood levels of these nutrients tested every 6 months and have a dual-energy x-ray absorptiometry (DEXA) for bone density performed yearly until your bone health is stable. Based on these tests, your doctor may adjust the amount of vitamin D and calcium supplementation you take.

How are vomiting and dumping syndrome managed?

Vomiting and dumping syndrome are possible side effects of operations that reduce the size of the stomach. Vomiting occurs

most commonly during the first few postoperative months, when you are adapting to a small stomach pouch. Vomiting can result from eating foods that are too tough—you need to gradually progress from liquid to soft to solid food. It may also be due to eating too quickly or too much, taking bites that are too big, or not chewing your food enough. Vomiting can also be caused by dehydration. To prevent vomiting, you need to pay attention to signs of fullness, eat slowly, and drink plenty of fluids. AGB patients may need an adjustment of the band.

Dumping syndrome refers to a group of symptoms, such as nausea, weakness, light-headedness, and abdominal cramps, that occur when the undigested contents of your stomach are “dumped” into your small intestine too quickly. This rapid emptying can be triggered by too much sugar or fatty foods. Dumping symptoms tend to decrease with time and can usually be controlled with certain nutritional changes, such as:

- avoiding drinking liquids within 30 minutes of a solid-food meal
- increasing the amount of protein you eat
- avoiding simple carbohydrates (such as sugary foods and drinks), which are easily digested
- increasing your intake of fiber and complex carbohydrates (such as wholegrain foods), which take longer to digest

If this approach doesn't work, then your doctor may prescribe a medication for you to take before meals to manage your symptoms.

What effect will bariatric surgery have on obesity-related health conditions?

The effect of bariatric surgery goes beyond weight loss in people who are severely obese. In most patients, obesity-related health problems disappear or greatly improve. For example, very soon after a malabsorptive procedure, type 2 diabetes can improve to the point that little or no diabetes medication is necessary. Likewise, insulin-treated patients require much less insulin, and most can discontinue insulin therapy by 6 weeks after surgery.

Bariatric surgery can also improve or resolve other conditions, such as hypertension (high blood pressure), high cholesterol, non-alcoholic fatty liver disease, obstructive sleep apnea, joint disease, asthma, and infertility due to polycystic ovarian syndrome. If you were taking medications before surgery to treat conditions such as diabetes, high blood pressure, or high cholesterol, you may need to adjust your dosage right after surgery. It is important for your doctor to monitor such conditions in follow-up exams.

What can you do to help your treatment process?

Surgery isn't a quick fix to obesity and obesity-related health problems. You and your health care team will need to work together for the long term to ensure the best outcome. After surgery, follow your doctor's advice for treatment and see him or her regularly for testing and monitoring of your condition so needed changes can be made before serious complications develop. You also need to make a lifelong commitment to eating healthy meals and exercising regularly to prevent weight regain.

EDITOR

Edward H. Livingston, MD

November 2010

© The Hormone Foundation 2010