



# Bariatric Surgery and the Endocrine System: Benefits and Risks

## WHAT IS BARIATRIC SURGERY?

Bariatric surgery helps people who are very obese to lose a lot of weight and improve their health. Most weight-loss surgeries limit how much food your stomach can hold, making you feel full after just a small meal (called restriction). They sometimes also limit the calories and nutrients your body can absorb (called malabsorption). Studies show that bariatric surgery also changes the action of certain hormones, such as ghrelin—"the hunger hormone." People have these types of surgery if other methods of weight loss have not worked for them and/or if they have serious health problems caused by obesity.

Bariatric surgery could have both benefits and risks for your endocrine system—the network of glands that produce, store, and release hormones. Hormones play a part in your body's energy balance, reproductive system, growth and development, and reactions to stress and injury. Different types of bariatric surgery vary in the kind and degree of risks and benefits.

## DID YOU KNOW?

**Bariatric surgery can help you lose a lot of weight and reduce related health problems, but you still need to choose foods wisely and get regular exercise to prevent weight regain.**

## WHAT ARE THE MOST COMMON TYPES OF BARIATRIC SURGERY?

Although new techniques are always evolving, the most common types of bariatric surgery today are

- **Adjustable gastric band (AGB).** In AGB surgery, a band is placed around the top of the stomach to create a very small pouch that can hold only a small amount of food. Doctors can later adjust the size of the opening that lets food pass into the rest of the stomach.
- **Roux-en-Y gastric bypass (RYGB).** RYGB reduces the size of the stomach, causes hormonal changes, and can lower the amount of nutrients that are absorbed from food. The digestive tract is rerouted, bypassing most of the stomach and part of the small intestine.

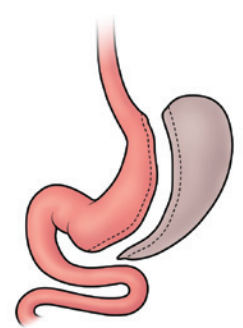
**Adjustable  
Gastric Band  
(AGB)**



**Roux-en-Y  
Gastric Bypass  
(RYGB)**



**Vertical Sleeve  
Gastrectomy  
(VSG)**



- **Vertical sleeve gastrectomy (VSG).** VSG greatly reduces the size of the stomach to lower food intake. It also slows down how quickly food leaves your stomach, and causes hormonal changes.

## WHAT ARE THE ENDOCRINE-RELATED BENEFITS OF BARIATRIC SURGERY?

Bariatric surgery and the weight loss that results can

- Improve or eliminate type 2 diabetes. RYGB can improve diabetes within days, even without weight loss.
- Help bring blood fat levels back to normal—lowering LDL (bad) cholesterol and triglycerides, and raising HDL (good) cholesterol.
- Improve fertility in women who are obese, especially women with polycystic ovary syndrome (PCOS). PCOS is a common condition in women of reproductive age. It can result in diabetes, high blood pressure, and unhealthy blood fat levels.
- Increase testosterone levels in men who are very obese.
- Improve or eliminate high blood pressure.

## WHAT ARE THE ENDOCRINE-RELATED RISKS OF BARIATRIC SURGERY?

Risks of bariatric surgery are most often linked to malabsorptive procedures, but they also can occur after restrictive procedures (those that only reduce the size of the stomach). Risks include

- **Macronutrient deficiency**—a lack of protein calorie absorption that, in severe cases, can cause swelling, diarrhea, and heart problems
- **Micronutrient deficiency**—a lack of vitamins and minerals, which are essential for many functions in the body
- Bone loss leading to weak bones
- Low blood glucose levels after eating carbohydrate-containing foods, also called hypoglycemia, possibly causing fainting
- Peripheral neuropathy, a form of nerve damage to feet, legs, or hands, causing pain, numbness, or tingling

Some of these surgical effects take a long time to develop, and symptoms may only occur many years after surgery. You can easily prevent complications by getting enough protein in your diet and taking daily vitamin and mineral supplements for life. You should also follow up with your primary physician and surgeon for monitoring. The effects on other hormonal systems are still unknown and are areas of active research.

## Questions to ask your doctor

- What kind of bariatric surgery is best for me?
- How do I choose a bariatric surgeon?
- What are the benefits and risks of the type of surgery I choose?
- How can I keep from gaining weight after my surgery?
- What else can I do to keep myself healthy after surgery?
- Should I see an endocrinologist for my care after surgery?

## RESOURCES

- Find-an-Endocrinologist: [www.hormone.org](http://www.hormone.org) or call 1-800-HORMONE (1-800-467-6663)
- Hormone Health Network information about obesity and bariatric surgery: [www.hormone.org/Resources/cardiovascular-and-metabolic-disorders.cfm](http://www.hormone.org/Resources/cardiovascular-and-metabolic-disorders.cfm)
- American Society of Bariatric Physicians (Physician location service): [www.asbp.org/apps/find\\_a\\_weight\\_loss\\_doctor](http://www.asbp.org/apps/find_a_weight_loss_doctor)
- American Society for Metabolic and Bariatric Surgery: [asmbs.org/](http://asmbs.org/)
- MedlinePlus (National Institutes of Health--NIH): [www.nlm.nih.gov/medlineplus/weightlossurgery.html](http://www.nlm.nih.gov/medlineplus/weightlossurgery.html)
- Weight-control Information Network (NIH): [win.niddk.nih.gov](http://win.niddk.nih.gov)

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The Hormone Health Network offers free, online resources based on the most advanced clinical and scientific knowledge from The Endocrine Society ([www.endo-society.org](http://www.endo-society.org)). The Network's goal is to move patients from educated to engaged, from informed to active partners in their health care. This fact sheet is also available in Spanish at [www.hormone.org/Spanish](http://www.hormone.org/Spanish).

**Bariatric Surgery and the Endocrine System: Benefits and Risks Fact Sheet**



[www.hormone.org](http://www.hormone.org)