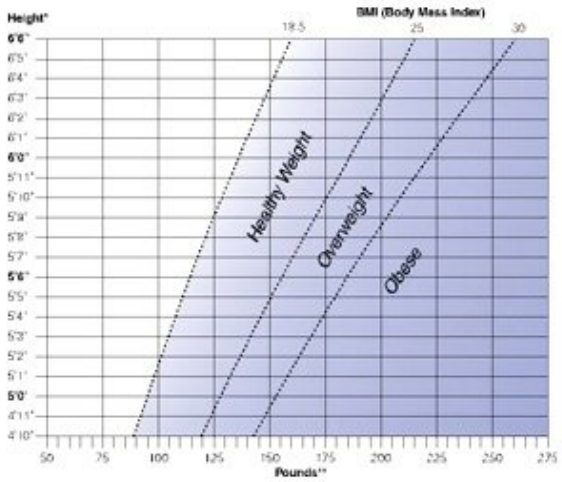
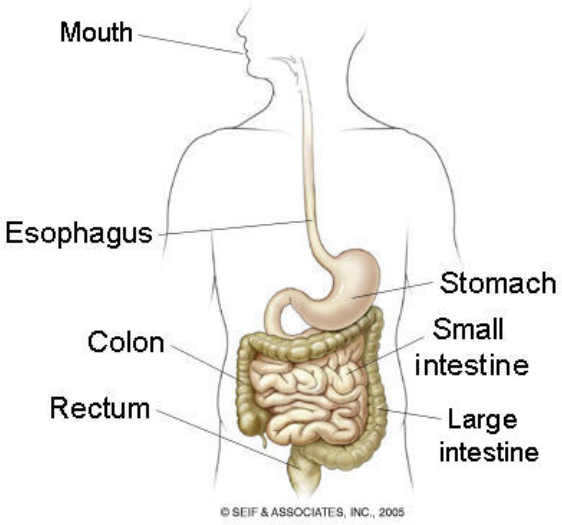
Bariatric Surgery, Gastrointestinal Surgery for Severe Obesity

Severe obesity is a longstanding condition. It is difficult to treat through diet and exercise alone. Gastrointestinal surgery is the best option for people who are severely obese and cannot lose weight by traditional means, or who suffer from serious obesity-related health problems. The surgery promotes weight loss by decreasing the absorption of food and, in some operations, interrupting the digestive process. As in other treatments for obesity, the best results are achieved with healthy eating behaviors and regular physical activity.



People who may consider gastrointestinal surgery include those with a body mass index (BMI) above 40. This is about 100 pounds of overweight for men and 80 pounds for women. People with a BMI between 35 and 40 and who suffer from type 2 diabetes or life-threatening cardiopulmonary (heart and lung) problems, such as severe sleep apnea or obesity-related heart disease, may also be candidates for surgery. (To use the Body Mass Index chart. find your weight on the bottom of the graph. Go straight up from that point until you come to the line that matches your height. Then look to find your weight group).

The idea of gastrointestinal surgery to control obesity grew out of results of operations for cancer or severe ulcers that removed large portions of the stomach or small intestine. Patients undergoing these procedures tended to lose weight after surgery. So some physicians began to use such operations to treat severe obesity. The first operation that was widely used for severe obesity was the intestinal bypass. This operation was first used 40 years ago. It produced weight loss by causing malabsorption. The idea was that patients could eat large amounts of food, which would be poorly digested or passed along too fast for the body to absorb many calories. The problem with this surgery was that it caused a loss of essential nutrients. Also, its side effects were unpredictable and sometimes fatal. The original form of the intestinal bypass operation is no longer used.



THE NORMAL DIGESTIVE PROCESS

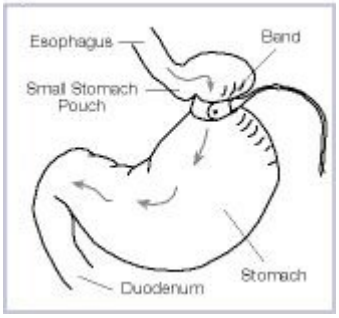
Normally, as food moves along the digestive tract, digestive juices and enzymes digest and absorb calories and nutrients. After we chew and swallow our food, it moves down the esophagus to the stomach. There a strong acid continues the digestive process. The stomach can hold about 3 pints of food at one time. When the stomach contents move to the first portion of the small intestine (*duodenum*), bile and pancreatic juice speed up digestion. Most of the iron and calcium in the foods we eat is absorbed in the duodenum. The jejunum and ileum are the remaining two segments of the nearly 20 feet of small intestine. They complete the absorption of almost all calories and nutrients. The food particles that cannot be digested in the small intestine are stored in the large intestine until eliminated.

HOW DOES SURGERY PROMOTE WEIGHT LOSS?

Gastrointestinal surgery for obesity is also called bariatric surgery. It alters the digestive process. The operations promote weight loss by closing off parts of the stomach. This will make it smaller. Operations that only reduce

stomach size are known as “restrictive operations”. They restrict the amount of food the stomach can hold. Some operations combine stomach restriction with a partial bypass of the small intestine. These procedures create a direct connection from the stomach to the lower segment of the small intestine. This causes bypassing portions of the digestive tract that absorb calories and nutrients. These are known as malabsorptive operations.

Figure 2



WHAT ARE THE SURGICAL OPTIONS?

There are several types of restrictive and malabsorptive operations. Each one carries its own benefits and risks.

➢ Restrictive Operations

Restrictive operations serve only to restrict food intake. They do not interfere with the normal digestive process. To perform the surgery, doctors create a small pouch at the top of the stomach where food enters from the esophagus. At first, the pouch holds about 1 ounce of food. It later expands to 2-3 ounces. The lower outlet of the pouch usually has a diameter of only about ¾ inch. This small outlet delays the emptying of food from the pouch and causes a feeling of fullness. As a result of this surgery, most people lose the ability to eat large amounts of food at one time. After an operation, the person usually can eat only ¾ to 1 cup of food without discomfort or nausea. Also, food has to be well chewed. Restrictive operations for obesity include adjustable gastric banding (AGB) and vertical banded gastroplasty (VBG).

Figure 3

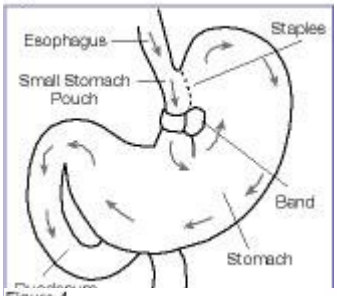
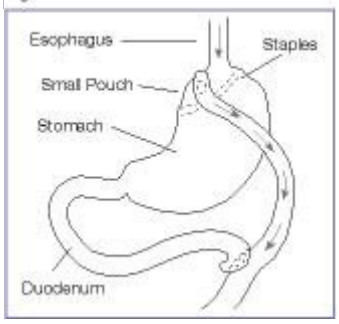


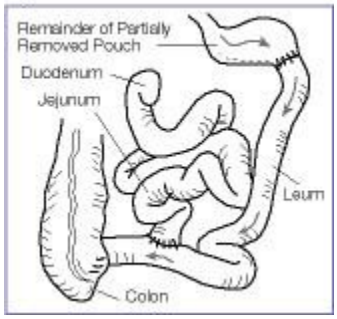
Figure 4



- ***Adjustable gastric banding*** In this procedure, a hollow band made of special material is placed around the stomach near its upper end. This creates a small pouch and a narrow passage into the larger remainder of the stomach. The band is then inflated with a salt solution. It can be tightened or loosened over time to change the size of the passage by increasing or decreasing the amount of salt solution.
- The band is adjusted based on feelings of hunger and weight loss. Patients decide when they need an adjustment and come to their surgeons to evaluate this. The adjustment is done as an office visit. The band is fully reversible with a second surgery if the patient changes his/her mind. There is no cutting or re-routing of the intestine.
- ***Vertical banded gastroplasty*** VBG has been the most common restrictive operation for weight control. Both a band and staples are used to create a small stomach pouch. Vertical banded gastroplasty is based on the same principle of restriction as the band. But the stomach is surgically altered with the stapling. This treatment is not reversible.

Restrictive operations lead to weight loss in almost all patients. But they are less successful than malabsorptive operations in achieving substantial, long-term weight loss. About 30 percent of those who undergo VBG achieve normal weight. About 80 percent achieve some degree of weight loss. Some patients regain weight. Others are unable to adjust their eating habits and fail to lose the desired weight. Successful results depend on the patient's willingness to adopt a long-term plan of healthy eating and regular physical activity.

Figure 5



A common risk of restrictive operations is vomiting. This is caused when the small stomach is overly stretched by food particles that have not been chewed well. Band slippage and saline leakage have been reported after AGB. Risks of VBG include wearing away of the band and breakdown of the staple line. In a small number of cases, stomach juices may leak into the abdomen. This requires an emergency operation. In less than 1 percent of all cases, infection or death from complications may occur.

➢ Malabsorptive Operations

Malabsorptive operations are the most common gastrointestinal surgeries for weight loss. They restrict both

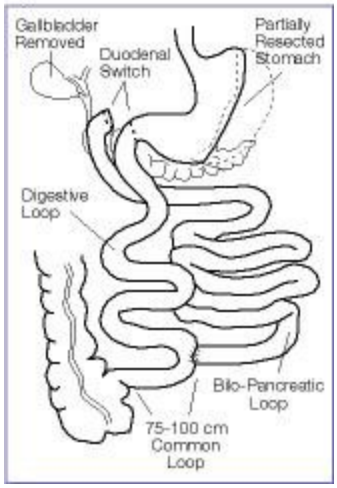
food intake and the amount of calories and nutrients the body absorbs.

- ***Roux-en-Y gastric bypass (RGB)*** This operation is the most common and successful malabsorptive surgery. First, a small stomach pouch is created to restrict food intake. Next, a Y-shaped section of the small intestine is attached to the pouch. This allows food to bypass the lower stomach, the first segment of the small intestine (*duodenum*), and the first portion of the *jejunum* (the second segment of the small intestine). This bypass reduces the amount of calories and nutrients the body absorbs.
- ***Biliopancreatic diversion (BPD)*** In this more complicated malabsorptive operation, portions of the stomach are removed. The small pouch that remains is connected directly to the final segment of the small intestine, completely bypassing the duodenum and the jejunum. This procedure successfully promotes weight loss. But it is less frequently used than other types of surgery because of the high risk for nutritional deficiencies. A variation of BPD includes a "duodenal switch". This leaves a larger portion of the stomach intact, including the pyloric valve. This valve regulates the release of stomach contents into the small intestine. It also keeps a small part of the duodenum in the digestive pathway.

Malabsorptive operations produce more weight loss than restrictive operations. And they are more effective in reversing the health problems associated with severe obesity. Patients who have malabsorptive operations generally lose two-thirds of their excess weight within 2 years.

In addition to the risks of restrictive surgeries, **malabsorptive operations also carry greater risk for nutritional deficiencies.** This is because the procedure causes food to bypass the duodenum and jejunum. That is where most iron and calcium are absorbed. Menstruating women may develop anemia because not enough vitamin B12 and iron are absorbed. Decreased absorption of calcium may also bring on osteoporosis and metabolic bone disease. Patients are required to take nutritional supplements that usually prevent these deficiencies. Patients who have the biliopancreatic diversion surgery must also take fat-soluble (dissolved by fat) vitamins A, D, E, and K supplements.

Figure 6



RGB and BPD operations may also cause "dumping syndrome". This means that stomach contents move too rapidly through the small intestine. Symptoms include nausea, weakness, sweating, faintness, and sometimes diarrhea after eating. The duodenal switch operation keeps the pyloric valve intact. So it may reduce the likelihood of dumping syndrome.

The more extensive the bypass, the greater the risk is for complications and nutritional deficiencies. Patients with extensive bypasses of the normal digestive process require close monitoring. They also need life-long use of special foods, supplements, and medications.

EXPLORE BENEFITS AND RISKS

Surgery to produce weight loss is a serious undertaking. Anyone thinking about surgery should understand what the operation involves. Patients and physicians should carefully consider the following benefits and risks.

- **Benefits**
  - Right after surgery, most patients lose weight quickly. They continue to lose for 18 to 24 months after the procedure. Most patients regain 5 to 10 percent of the weight they lost. But many maintain a long-term weight loss of about 100 pounds.
  - Surgery improves most obesity-related conditions. For example, in one study blood sugar levels of 83 percent of obese patients with diabetes returned to normal after surgery. Nearly all patients whose blood sugar levels did not return to normal were older. Or they had lived with diabetes for a long time.
- **Risks**
  - Ten to 20 percent of patients who have weight-loss surgery require follow-up operations to correct complications. Abdominal hernia was the most common complication requiring follow-up surgery. But laparoscopic techniques seem to have solved this problem. In laparoscopy, the surgeon makes one or

more small incisions. Slender surgical instruments are passed them. This technique eliminates the need for a large incision. And it creates less tissue damage. Patients who are super obese (greater than 350 pounds) or have had previous abdominal surgery, may not be good candidates for laparoscopy. Less common complications include breakdown of the staple line and stretched stomach outlets.

- Some obese patients who have weight-loss surgery develop gallstones. These are clumps of cholesterol and other matter that form in the gallbladder. During quick or substantial weight loss, one's risk of developing gallstones increases. Taking supplemental bile salts for the first 6 months after surgery can prevent them.
- Nearly 30 percent of patients who have weight-loss surgery develop nutritional deficiencies. These include anemia, osteoporosis, and metabolic bone disease. These usually can be avoided if vitamin and mineral intakes are high enough.
- Women of childbearing age should avoid pregnancy until their weight becomes stable. Quick weight loss and nutritional deficiencies can harm a growing fetus.
- Other risks of restrictive surgeries include:
  - Band slippage.
  - Stomach prolapse.
  - Band erosion into the lumen of the stomach.
  - Port infection.
- The main risk with malabsorption operations is life threatening. It is the risk of leak from any of the anastomosis. The more involved the operation, the more risk involved.
- There is one other risk of having the surgery. If people do not follow a strict diet, they will stretch out their stomach pouches. Then they will not lose weight.

MEDICAL COSTS

Gastrointestinal surgery costs vary. They depend on the procedure. Medical insurance coverage varies by state and insurance provider. If you are considering gastrointestinal surgery, contact your:

- Regional Medicare or Medicaid office.
- Or insurance plan.

Find out from them if the procedure is covered.

IS THE SURGERY FOR YOU?

- Gastrointestinal surgery may be the next step for people who:
  - remain severely obese after trying nonsurgical approaches.
  - have an obesity-related disease.
- Candidates for surgery have:
  - A BMI of 40 or more.
  - A BMI of 35 or more and a life-threatening obesity-related health problem such as:
    - Diabetes.
    - Severe sleep apnea.
    - Heart disease.
  - Obesity-related physical problems that interfere with:
    - Employment.
    - Walking.
    - Family function.

If you fit the profile for surgery, answers to these questions may help you decide whether weight-loss surgery is appropriate for you. *Are you:*

- Unlikely to lose weight successfully without surgery?
- Well informed about the surgical procedure? The effects of treatment?
- Determined to lose weight? Improve your health?
- Aware of how your life may change after the operation? Adjustment to the side effects of the surgery include the need to chew well and being unable to eat large meals.
- Aware of the potential for serious complications? Dietary restrictions? Occasional failures?
- Committed to lifelong medical follow-up?
- Restrictive operations are very successful with patients who follow a diet created by a dietician. Support

groups and follow up with caregivers is important.

Remember: There are no guarantees for any method to produce and maintain weight loss. This includes surgery. Success is possible only with:

- Maximum cooperation.
- Commitment to behavioral change.
- Medical follow-up.

This cooperation and commitment must be carried out for the rest of your life.

ADDITIONAL RESOURCES

American Society for Bariatric Surgery
140 NW 75th Drive, Suite C
Gainesville, FL 32607
www.asbs.org

Weight-control Information Network (WIN)
1 WIN WAY
BETHESDA, MD 20892-3665
www.niddk.nih.gov/health/nutrit/nutrit.htm

Most of this information Courtesy of the National Institutes of Health

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