



KAISER PERMANENTE®

Northern California
Bariatric Surgery Program

Choosing and Preparing for Bariatric Surgery (Book One)



Roux-En-Y Gastric Bypass



Sleeve Gastrectomy

<http://bariatric-northerncalifornia.kp.org>

<http://mydoctor.kaiserpermanente.org/ncal/healthyweight>

Please bring this binder to every appointment

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Chapter 1: Intro to the Northern California Bariatric Surgery Program

“Knowing is not enough, we must apply. Being willing is not enough, we must do.”

Johann Wolfgang von Goethe

Welcome

The Kaiser Permanente Bariatric Surgery Programs offer a team-oriented approach to the management of obesity and include the expertise of surgeons, bariatric physicians, psychologists, registered dietitians, registered nurses, health educators, and support staff. Our teams are committed to a goal of maximizing your chances for success while minimizing your risks.

Although the operation itself is an important part of the program, **it is only one tool** that may help you achieve and maintain weight loss. Successful weight loss requires a commitment to lifelong changes: eating fewer calories, eating healthier foods, eating mindfully, taking vitamins, exercising regularly, and feeling psychologically and socially supported.

Who qualifies for Bariatric Surgery?

Weight loss operations are appropriate for adult members (over age 18) with a:

- Body Mass Index (BMI) greater than 40 or
- Body Mass Index (BMI) greater than 35 with a serious weight related condition

The body mass index is a calculation based on your weight and height. If you want to know your exact BMI, the actual calculation uses kilograms divided by meters squared, so it is easiest to use an online BMI calculator.

The ideal candidate for surgery is the person who has seriously tried to lose weight in the past, understands the risks and benefits of surgery, understands the lifelong changes in lifestyle required for success, and has the support of family and friends to help him or her through the process.

If you meet the criteria above, your primary doctor can refer you to the bariatric program. It is important to remember that the ultimate decision on whether bariatric surgery is right for you rests with the multidisciplinary bariatric team.

Regional Bariatric Centers

In general, surgical centers that perform a high number of weight loss operations perform the operations with lower risk and lower complications. Centers with multidisciplinary teams focused on weight loss education are shown to improve long term weight loss success. For this reason, regional bariatric centers were created to provide patients with the maximum expertise and safety.

The Kaiser Permanente Northern California Bariatric Centers are:

- Fremont
- Fresno
- Richmond
- South San Francisco
- South Sacramento

Our outcomes and results are tracked and reported regularly, and our mortality and complication rates remain consistently better than the national averages.

You can find out more about each site on our website:

<http://bariatric-northerncalifornia.kp.org>

Read this entire workbook carefully.

- It contains the information you need to prepare for bariatric surgery and to be successful after your surgery!
- Your knowledge of the process and the impact on your way of life will significantly help you achieve your goals.

Chapter 2: Obesity and Weight Loss Surgery

Obesity is common and serious

Obesity refers to having too much fat in your body. Your excess fat can be roughly estimated by your body mass index. A normal BMI is about 18 to 25. A BMI over 25 is considered overweight, a BMI over 30 is considered obese, and a BMI over 40 is considered morbidly obese.

In 2016, about 93 million people in the United States, or roughly 40% of the population, were obese.

The reasons for obesity are very complex and not yet fully understood.

Some the factors are:

- Food choices and eating patterns
- Lack of physical activity
- Genetics
- Differences in absorption
- Medical conditions
- Medications.

Obesity can contribute to some of the leading causes of preventable death such as:

- Diabetes mellitus
- Hypertension
- Heart disease
- Stroke
- Lung disease
- Sleep apnea
- Certain types of cancer

Obesity can also contribute to other medical problems such as:

- Arthritis and joint pain
- Infertility, Polycystic Ovary Syndrome
- Psychological problems

- Heartburn /gastroesophageal reflux disease (GERD)
- Incontinence
- Skin infections and ulcers

How does food lead to obesity?

Fat is a “savings account” of food we do not use right away.

Humans eat food to obtain energy. Our body breaks down food until it is liquified and absorbed by our digestive system into the blood stream, and then sent to all the cells in our body to be used for energy. Energy from our food is measured in calories. If all the calories from food are not used within a few hours, the extra calories are stored as fat. This is your body’s built in system to ensure survival when there is no food. **Every pound of fat contains about 3,500 calories** and represents 3,500 calories of food that was eaten but not used.

Every time you eat more calories than you use, you make fat. The only way to lose fat is to eat less and use more energy by being active. This forces your body to use the energy stored in your fat, and “tap into your savings account”. You will need to use up around 3,500 calories to lose about one pound of fat.

Calories digested (Eaten)	Calories used (activity)	FAT
HIGH	Low	MAKE FAT
Low	HIGH	Lose fat

Metabolic Adaptation can make fat loss difficult.

Most people need a minimum amount of energy to live every day, even if they are not very active. This is called your basal metabolism. It is the energy you need to breathe, keep your body warm, and live. Although many people think that the average diet should be about 2000 calories a day, most people can live on less than that. If you are not very active, then even 2000 calories a day can lead to fat gain.

Our bodies will accept growing and gaining weight, but our bodies do not recognize when we are overweight. There are no natural drives in our bodies that help us lose weight, but there are many natural mechanisms that try to maintain our weight no matter what it is. When people go on a very low-calorie diet suddenly or start starving themselves, their bodies view this as dangerous. To prevent you from dying, your body will lower your basal metabolism more than usual. This means that you can survive on even less calories than you needed before. This “metabolic adaptation” is another survival mechanism that allows your body to survive much

longer when there is no food. Your body will also increase your hunger, trying to convince you to look for food and eat it. Unfortunately, this makes losing fat even more difficult.

Let's look at the following example:

- Mrs. P is 200 lbs and not very active. Her basal metabolism is about 1600 calories a day.
- Mrs. P goes on vacation for 7 days and eats a bit more than usual: about 2100 calories a day. Because she is eating an extra 500 calories a day ($2100 - 1600 = 500$), at the end of the week she will have an extra 3,500 calories that she did not need, and she will gain 1 pound of fat.
- Mrs. P returns from vacation and decides that she needs to lose the one pound of fat she gained, and she goes on a crash diet of 1100 calories a day. Based on this, you would guess that she should be able to lose about 500 calories of fat each day and lose 1 pound after one week. Unfortunately, as soon as Mrs. P goes on her diet, her body activates her survival mechanisms, and lowers her basal metabolism to 1200 calories a day. Based on this, she only loses 100 calories of fat each day ($1200 - 1100 = 100$), and it now takes her 35 days to lose 1 pound. It takes her 5 times longer to lose a pound than it did to gain it!
- How do we prevent this? The best way to prevent metabolic adaptation is to be as active as possible. If Mrs. P increased her activity, she would still need to use 1600 calories a day or more, and she would be able to lose her pound of fat in one week.

Understanding the calories in our food can help us understand why we gain fat.

When you eat an extra 100 calories a day, it is possible to gain 1 pound of fat each month. Eventually this leads to an extra 12 extra pounds in one year, an extra 60 pounds in 5 years, and an extra 120 pounds in 10 years. In other words, eating just a little bit extra every day can add up to over an extra 100 pounds over time.

Each of the following contain 100 calories each –

Foods with 100 calories each	
<ul style="list-style-type: none"> • 1/3 of a cheeseburger • 1 tablespoon peanut butter • 9 Lay's chips • 1/9 Block Tillamook sharp cheddar • 23 M&Ms • 1 Reese's peanut Butter cup • 3/4 can of soda • 1 medium banana or apple • 2 Oreo cookies • 1/3 slice of pizza • 25 baby carrots • 3 tablespoons Ben and Jerry's 	<p>An extra ONE of these every day → 10 pounds in 1 year</p> <p>An extra TWO of these every day → 20 pounds in 1 year</p>

How does bariatric surgery help lose fat?

The exact way bariatric surgery helps a person lose fat is still unclear. The operation probably works in the following ways:

- Having a smaller stomach keeps you from have a big meal quickly. It forces you to eat slowly and hopefully eat less. If you eat less calories, this will help you to lose weight. However, it does not help you actually choose the food you eat.
- The operation diminishes hunger temporarily, which allows you to stay on a very low-calorie diet without feeling too hungry. The reasons for this are not well understood, and unfortunately the effect may only last a year or two. Over time the hunger returns.
- **Bariatric surgery is ONLY A TOOL that can help to break the cycle of obesity. It must be combined with good nutrition, healthy food choices, exercise, and activity.**
- **You can think of it as a RESET button on your weight. It allows you to maintain a low-calorie diet for a year or so without feeling hungry.**
- **The goal is for you to get to your lowest weight within the first year, and then maintain that weight for the rest of your life.**
- **Weight management is a DAILY LIFETIME challenge.**

Successful surgery, healthy eating, and exercise can shift obesity from a disease that a person must battle to a choice that a person can control.

Weight Loss After Surgery

How much of the extra weight can a person expect to lose after weight loss surgery?

National and Northern California Kaiser data show the following:

1 year after Gastric Bypass:	On average, people lose 75-90% of their extra weight.
1 year after Sleeve gastrectomy:	On average, people lose 70-85% of their extra weight.

However, after 1 year, there is a tendency to start gaining weight again.

6 years after Gastric Bypass:	On average, people keep 65-70% of their extra weight off
6 years after Sleeve Gastrectomy:	On average, people keep 50-60% of their extra weight off

This means that the **average** person who starts 100lbs overweight will be 65-70lbs less with a gastric bypass and 50-60lbs less with a gastric sleeve after 6 years. After a gastric bypass, most people are still able to maintain this amount of weight loss for 10 to 20 years or longer. Because the sleeve gastrectomy is a newer operation, we are not yet sure what the long-term weight loss is after 10 years. This is the **average** weight loss, which means there are people who lose more weight than this, and there are many people who lose much less.

It is important to remember that people can regain their weight at any time in their lives if they stop paying attention to their weight, food, and exercise. As we said before, it only takes an extra 100 calories a day to gain all 100lbs back. Ultimately, no matter how small the stomach is, there is no stomach that can prevent you from eating an extra 100 calories a day if that is what you choose to do.

Conditions Improved with Weight Loss with Bariatric Surgery

Many medical conditions improve with significant weight loss. However, complete improvement or “cure” is not guaranteed because many of the conditions are also related to genetics and aging. In other words, there are many people of normal weight and size who may still develop these conditions. Bariatric surgery may or may not help you lose weight, but it cannot change your genetics and it cannot keep you from growing older.

Diabetes (Adult onset)

Studies show that over 80% of people can reduce their diabetic medications following bariatric surgery. Many people can stay off diabetic medications completely for many years. However, this is also dependent on the severity and duration of diabetes before surgery. Diabetes will improve with both gastric bypass and sleeve gastrectomy only if the patient is able to lose weight and maintain that weight loss. On average, diabetes seems to improve more with the gastric bypass compared to the sleeve gastrectomy. Therefore, the gastric bypass is usually the suggested operation for people with severe diabetes, who have had diabetes for many years, need insulin to manage their diabetes, or struggle to manage their diabetes. Successful weight loss can also reduce the chance of developing diabetic complications such as kidney, eye, and nerve damage. It can also reduce the risk of diabetes related heart attack and stroke.

Heart disease and strokes

Successful weight loss after bariatric surgery can reduce the risk of heart attack and stroke by 50 to 60 percent.

Hypertension

About 70% of patients will have significant improvement in blood pressure and are able to reduce the dosage of their medications. Depending on the severity of their hypertension some people may still need to continue some dose of medication.

Elevated Cholesterol

With successful weight loss, 70 to 80% of people no longer need medications to manage their high cholesterol and/or lipids. Triglycerides and LDL (bad cholesterol) tend to decrease, and HDL (good cholesterol) tends to increase. However, there may be other reasons, such as a prior heart attack or stroke, for you to continue treatment with cholesterol medications despite having great levels. Be sure to follow up with your primary care provider to determine if you need to continue your medications.

Sleep Apnea

Sleep apnea usually improves by one whole category of severity with weight loss. This means that severe apnea improves to moderate apnea, moderate apnea improves to mild apnea, and mild apnea can go away. Therefore, depending on the severity of your sleep apnea prior to surgery you may still need CPAP after surgery. If you had severe sleep apnea prior to surgery, we recommend a repeat sleep study 1 year after surgery. Untreated sleep apnea puts you at risk for heart disease, and can also make losing weight more difficult.

Arthritis

People report improvements in hip and knee pain years after bariatric surgery. However, people who already have severe damage to their joints may still suffer symptoms and need to manage their pain.

Your use of anti-inflammatory medications will also be limited after bariatric surgery and this may make pain control more difficult. **After a gastric bypass, the risk of ulcer is very high and you should no longer take any Non-Steroidal Anti-inflammatory medications, EVER.** This includes motrin, advil, alleve, Naprosyn, Celebrex, vioxx, nabumetone, Relafen, and other similar medications.

There is research to suggest that those with inflammatory arthritis such as rheumatoid arthritis may also have less inflammation in their wrists and fingers after weight loss.

It is unclear if back pain improves after bariatric surgery. In some cases, people may complain of increased pain. This may be due to increased physical activity or reduced medications.

Kidney Disease

Kidney disease is often related to high blood pressure, diabetes, and obesity itself. Weight loss can lead to significant improvement in kidney function, and also slow down the disease from getting worse.

Urinary incontinence can improve because losing abdominal fat often decreases abdominal pressure.

GERD, Heartburn, and Acid Reflux

Heartburn is caused by acid from the stomach travelling backward into the esophagus in your chest. When it travels higher to the back of your throat, it is known as acid reflux.

Gastroesophageal reflux disease (heartburn and reflux) often improves with a change in diet and weight loss which lowers abdominal pressure. The gastric bypass improves GERD symptoms in most people. The sleeve gastrectomy is less predictable because some people may have improvement, while others experience worse heartburn and reflux, and need to increase their medications.

Polycystic ovary syndrome (PCOS) and Infertility

In those with PCOS, weight loss will often improve irregular menstrual cycles and fertility (the ability to become pregnant). It is not clear if excess hair growth improves.

Patients who have had bariatric surgery have been shown to have safer pregnancies compared to morbidly obese women who have not.

We recommend postponing pregnancy for at least 18 months to 2 years after bariatric surgery. Because fertility increases, it is very easy to become pregnant in the first few years after bariatric surgery, and you will need to choose a reliable method of contraception. The birth control pill **MAY NOT** be effective due to malabsorption. Please consult with your GYN provider regarding the best method of birth control before and after bariatric surgery. Permanent birth control with a tubal ligation can also be considered, and sometimes performed at the same time as your bariatric surgery.

Fatty Liver

Fat in the liver can often cause inflammation and scar tissue that can eventually damage the liver. With weight loss, there can be a significant decrease in the fat and inflammation in the liver. This can often prevent the liver from becoming permanently damaged.

Pseudo Tumor Cerebri

Increased pressure in the fluid around the brain can lead to frequent headaches and sometimes visual changes. For reasons that are not completely understood, weight loss can result in a dramatic improvement in this condition.

Lung Disease

Obesity may limit one's ability to take a deep breath and expand the lungs. The extra weight also places more demand on the lungs and heart to supply oxygen. If this is a major reason for poor lung function, then weight loss can result in significant improvement.

Cancer risk

Obesity may increase the risk of certain cancers such as cancer of the breast, colon, endometrium (uterine), kidney, esophagus, pancreas, and prostate. There is some suggestion that significant weight loss can reduce the risk of these cancers developing in the future.

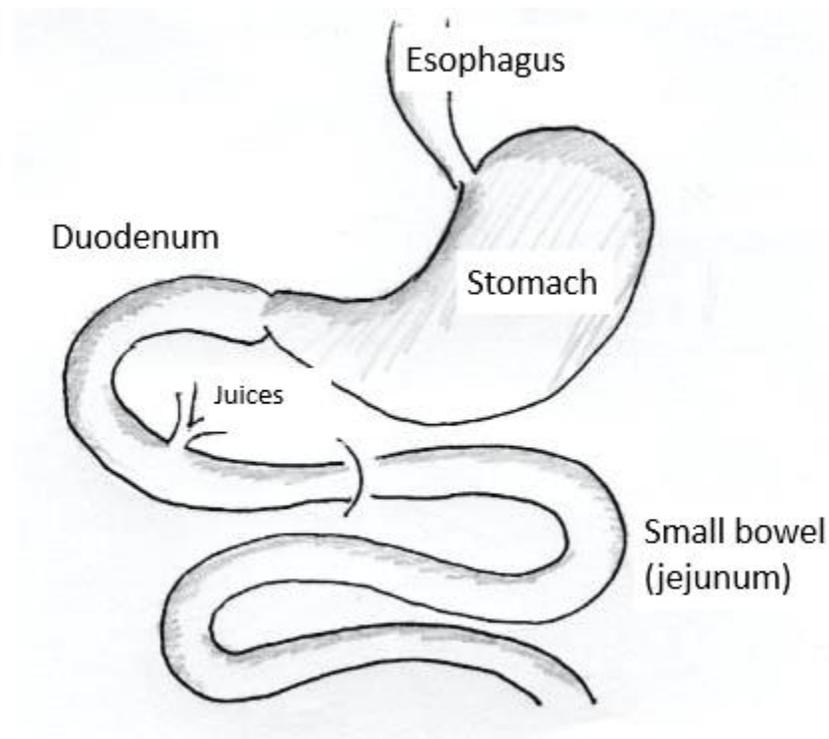
Psychosocial

The relationship between obesity and depression is complex. Most people report an improvement in depression and a significant improvement in their quality of life. However, there are also many people who are at increased risk of suicide, addiction (drugs, alcohol, etc.) and accidental death after bariatric surgery. Social and psychological support before and after bariatric surgery is extremely important.

Chapter 3A: Surgery as a Treatment for Obesity

The Normal Digestive System

The following provides a simple explanation of the structure and function of the parts of the gastrointestinal (GI) tract involved in the surgery.



*Diagram: Food passes from the esophagus to the stomach and eventually into the small bowel. The liver and pancreas make juices which mix with the food in the early portion of the small bowel (duodenum). The midportion of the small bowel is called the jejunum (**jej**).*

The stomach is a muscle. It can expand and shrink like other muscles. The empty stomach is about the size of your fist, and a large meal can stretch it to the size of a football. The stomach churns and mixes solid foods with acid to turn into a thick liquid. When the stomach is stretched out, it may send a signal to your brain that you interpret as “feeling full”. When the stomach is empty, it may also send a signal to your brain that you interpret as hunger.

The stomach empties into the first part of the small intestine called the duodenum, which is less than one foot long. It receives bile and other digestive enzymes from the liver and pancreas for digestion and absorption of nutrients.

Food, bile, and digestive enzymes then continue to travel through the rest of the small intestine. The second part of the small intestine is called the jejunum, which is about 10 feet long. The Ileum, the third and last part of the small intestine, is about 11 feet long. The total length of the small intestine is about 22 feet. Almost all your food and nutrients (e.g. iron, glucose, calcium, and vitamins) are absorbed in the small intestine.

The ileum connects to the colon, or large intestine, which is approximately 6 feet long. Its main function is to absorb fluid and, with the help of bacteria, convert food waste into stool. The colon stores the stool until it is expelled during a bowel movement.

Types of Weight Loss Surgery

Surgical procedures for the treatment of obesity can be divided into three main categories:

- Malabsorptive procedures
- Restrictive procedures
- Combined malabsorptive/restrictive procedures

Malabsorptive procedures usually involve bypassing long lengths of your small intestines which limits the number of calories you can absorb from the food you eat. In the past there were purely malabsorptive procedures such as the jejunal-ileal bypass (JIB) but they were abandoned due to very high complication rates. This has been replaced with the duodenal switch / biliopancreatic diversion. This has a very high risk of severe malnutrition and vitamin deficiencies, as well as a higher complication rate compared to gastric bypass or sleeve. Below is a diagram of the duodenal switch compared to the gastric bypass. You can see that in the duodenal switch, there is very little intestine left to absorb food or vitamins.

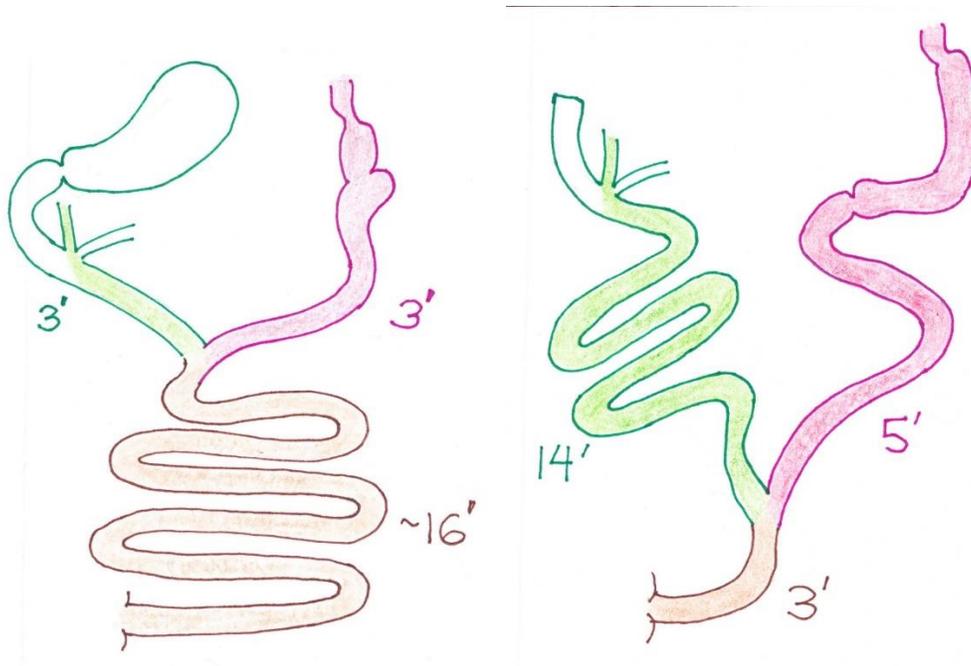


Diagram: Gastric bypass diagram (unwound) vs. Duodenal switch diagram (unwound)

Restrictive operations decrease the size of your stomach and limit the amount of food you can eat any one time. This includes both the gastric bypass and the sleeve gastrectomy. With the sleeve gastrectomy, because food has not been digested well in the altered stomach, the first part of the intestine does not fully absorb all the vitamins and minerals from the food. With the Roux en Y gastric bypass, there is also a small malabsorption component due to the bypassing of food around most of the stomach and first part of the small intestine. This also lowers the absorption of vitamins and certain nutrients. Both operations have a component of both restriction and malabsorption.

Open and Laparoscopic Procedures

Open surgery involves a large incision in your abdomen, and the surgeon performs the operation directly with their hands.

Laparoscopic surgery employs small instruments and a camera that are inserted into your abdomen via small incisions. These small incisions hurt less, and also decrease the risk of complications such as wound infections, hernias, blood clots and pneumonia. The majority of bariatric surgery is performed laparoscopically these days. Laparoscopic surgery can be challenging and more difficult in patients with a very high weight, a very large liver, or significant scar tissue from prior abdominal operations. Therefore, there may be rare instances

where a procedure is started laparoscopically but must be completed through an open incision. Whether your bariatric surgery is performed open or laparoscopically, there is no difference in the weight loss results.

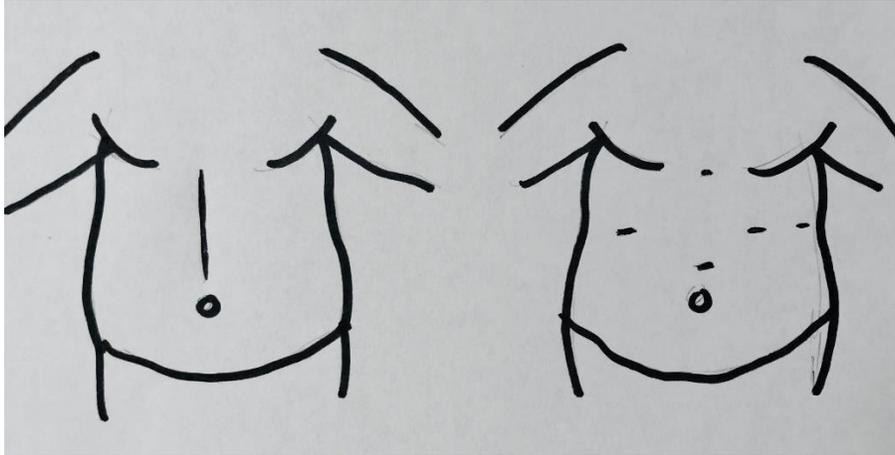
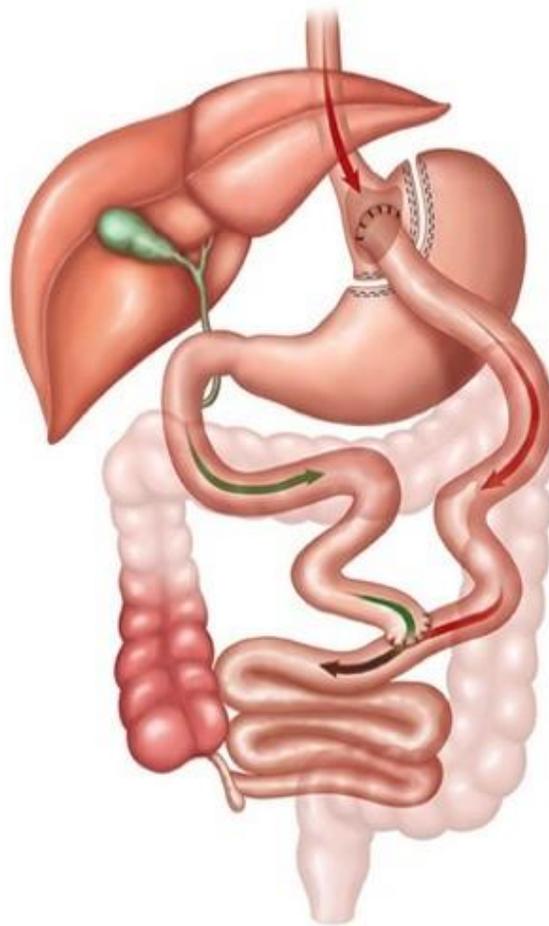


Diagram: Open incision vs. Laparoscopic incisions

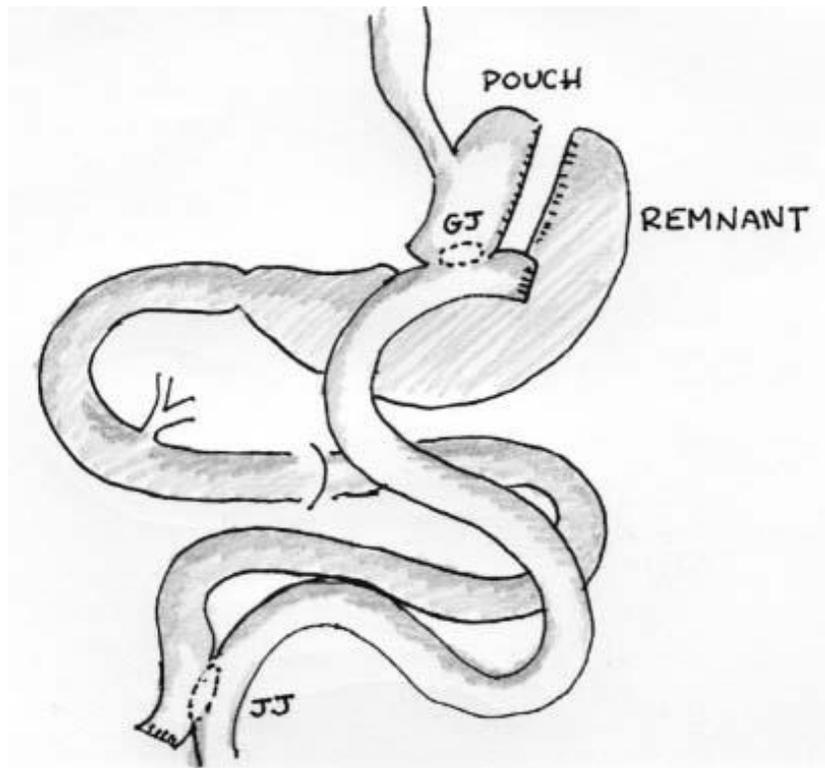
Chapter 3B: Roux-En-Y Gastric Bypass vs Sleeve Gastrectomy

Roux-en-Y Gastric Bypass

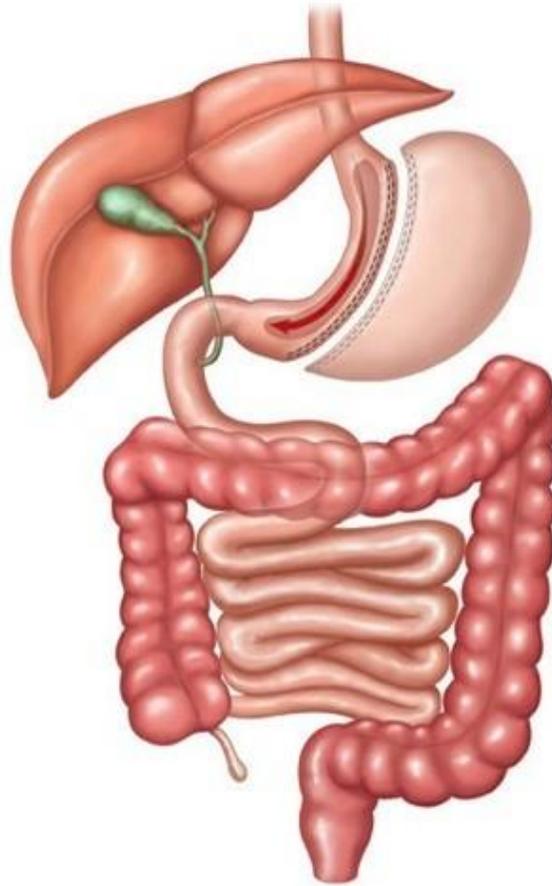
Laparoscopic Roux-en-Y Gastric Bypass (gastric bypass) has been established as the gold standard against which other bariatric procedures are compared. The gastric bypass is described as having both a restrictive effect caused by a small gastric pouch, as well as a malabsorptive effect caused by bypassing a segment of small intestine.



The basic concept of the gastric bypass is to create a small stomach nicknamed the “**pouch**”, about the size of an egg. The small bowel is then re-routed so that 75-150 cm (2 ½ to 4 feet) of intestine is bypassed. This operation creates two connections (anastomoses). The connection between the pouch and the intestine is called the **gastro-jejunal (GJ)** anastomosis. The connection between the two limbs of the small intestines is called the **jejuno-jejunal (JJ)** anastomosis. The Y in Roux-En-Y refers to the Y shaped connection of the JJ. The excluded stomach is called the **remnant** (remaining) stomach. Removing it completely increases surgical risk and does not seem to affect long term weight loss, so it is left in place. The remnant stomach is being **bypassed** by intestine using a **Y** connection.



Sleeve Gastrectomy



Laparoscopic Sleeve Gastrectomy (LSG) has rapidly gained popularity and is currently the most common weight loss operation performed worldwide. Sleeve gastrectomy was originally described in the 1990's and involves removing 70-80% of the stomach resulting in the creation of a narrow gastric tube with a volume of 5-7 ounces. The removed portion of the stomach is completely removed from your body, sent to the pathology lab, and then ultimately destroyed. Sleeve gastrectomy usually has fewer complications than the gastric bypass because it is technically simpler and results in less alteration of the normal anatomy.

Hiatal Hernia

As part of both Gastric Bypass and Sleeve Gastrectomy, your surgeon will also look for a condition known as a hiatal hernia. Hiatal hernia is when a portion of the stomach goes up into the chest cavity, because the tunnel between the chest and the abdomen is wider than usual. A hiatal hernia may be found and fixed 15-30% of the time during an operation. Fixing a hiatal hernia involves narrowing the tunnel to prevent the stomach from going into the chest. It does not add too much additional time or risk to the total operation.

Weight loss and Medical Conditions after gastric bypass vs sleeve gastrectomy

Weight loss

As we mentioned earlier in this chapter, at six years, the average person will lose about 65-70% of their extra weight with the help of the gastric bypass, and about 50-60% of their extra weight with the help of the gastric sleeve. It is important to understand that this number represents an *average*. It is possible to lose a significant amount of weight with either operation, and it is also possible to regain all the weight back with either operation. With both operations, healthy diet and regular exercise are mandatory for sustained success.

Diabetes

Diabetes will improve with both gastric bypass and sleeve gastrectomy only if the patient is able to lose weight and maintain that weight loss. On average, diabetes seems to improve more with the gastric bypass compared to the sleeve gastrectomy. Therefore, the gastric bypass is usually the suggested operation for people with severe diabetes, who have had diabetes for many years, need insulin to manage their diabetes, or struggle to manage their diabetes.

GERD and acid reflux

Acid reflux and heartburn often improves with a change in diet and weight loss which lowers abdominal pressure. Because acid is made in the lower portion of the stomach, with a gastric bypass the acid is primarily made in the remnant and not the pouch. For this reason, the Roux-en-Y Gastric Bypass is an excellent operation for heartburn and reflux.

With the sleeve gastrectomy, heartburn can increase with significant weight loss. However, in some cases despite the weight loss, it may be easier for acid to travel back up into the esophagus and chest. Some people may experience worse heartburn after the sleeve gastrectomy and may need to treat this with daily medications.

Early complications of the gastric bypass and sleeve gastrectomy

After any type of operation, people can have complications related to the operation or from general anesthesia. Early complications usually occur within the first few weeks of the operation.

Mortality (death)

Gastric bypass: 0.09 - 0.12 % (less than 1 in 900) in the first three months

Sleeve gastrectomy: 0.09 - 0.12 % (less than 1 in 900) in the first three months

Death is very rare and is usually related to an inability to recover from complications associated with surgery or due to pre-existing medical conditions.

Leak

Gastric bypass: Rare, less than 0.5%

Sleeve gastrectomy: Less than 1%. More common compared to gastric bypass.

A leak is a separation of the cut edges of the stomach or intestines due to incomplete healing. There is leakage of fluid from the intestine which leads infection, pain, and illness. Leaks almost always occur within the first few weeks after the operation, while the stomach is still healing. Leaks are more common with the sleeve gastrectomy than the gastric bypass because the sleeve gastrectomy has a longer higher-pressure staple line. Almost all leaks will require a re-operation and/ or additional procedures to prevent the fluid from causing further infection. As the leak heals, some people may need to depend on an IV nutrition or feeding tube nutrition to get adequate nutrition.

Bleeding

Gastric bypass: less than 1%

Sleeve gastrectomy: less than 1%

This can occur during or after surgery and may require blood transfusions or re-operation. Rarely, bleeding from the spleen may require its removal.

Blood clots

Gastric bypass: less than 0.5% Deep leg veins, lungs.

Sleeve gastrectomy: less than 1%. Deep leg veins, lungs, or portal vein.

Blood clots can occur in the deep leg veins (deep vein thrombosis or DVT) and can then move into the lungs (pulmonary embolus). Several measures are used to decrease this risk including the use of blood thinners and pneumatic compression stockings. Discontinuing use of an estrogen-based birth control or estrogen replacement therapy prior to surgery will also decrease the risk of blood clots. Blood clots are treated with anti-coagulation medication (blood thinners) for three to six months.

Clotting of the portal vein (which drains the intestines) seems to occur only with the sleeve gastrectomy. The reasons for this are not clear. Portal vein thrombosis also requires anti-coagulation medication (blood thinners) for six months.

Respiratory and cardiovascular problems

Gastric bypass: less than 1%

Sleeve gastrectomy: less than 1%

Lung infections like pneumonia can occur with either operation. This becomes more common in patients with pre-existing lung or respiratory conditions. Deep breathing and walking after surgery will decrease the risk of this complication.

The risk of heart attack, heart arrhythmias, and stroke is increased in patients with a prior history of known heart disease and stroke. Other risk factors include a history of smoking, higher weight, higher age, and minimal activity.

Late complications of gastric bypass and sleeve gastrectomy

Ulcers

Gastric bypass: Common, perhaps 5 – 10%.

Sleeve gastrectomy: Less common

Ulcers are erosions in the stomach lining and tissue that usually lead to severe pain and tissue destruction. Occasionally ulcers can present with life threatening perforation (a hole in the stomach) or bleeding requiring emergent surgery or endoscopy. The following agents are known to cause ulcers:

- Smoking including cigarettes, cigars, vaping, marijuana as well as chewing tobacco and use of other nicotine/tobacco products. People with both gastric bypass and sleeve gastrectomy must stop all these behaviors lifelong.
- NSAIDS: Aspirin, Advil, Motrin, ibuprofen, Naprosyn, Relafen, nabumetone, Celebrex, Excedrin, Aleve and other similar products. People with gastric bypass must avoid

NSAIDS lifelong. People with sleeve gastrectomy can usually take NSAIDS but must stop them immediately if they develop symptoms of an ulcer.

- Prednisone and other oral steroids.
- Alcohol
- Possibly Caffeine

Treatment includes anti-ulcer medications and stopping all the causes above.

Narrowing

Gastric bypass: less than 2%

Sleeve gastrectomy: very rare

Narrowing can be both an early or a late complication. In the gastric bypass, the connection between the stomach and intestine can become too small due to inflammation, excess scar tissue, or chronic ulcers. When this happens, the person has difficulty swallowing liquids and may not be able to eat any solid food without throwing up. The narrowing can usually be improved with an endoscopic procedure (through the mouth) where a balloon is used to dilate and enlarge the narrowing. Sometimes, multiple dilation procedures are necessary. If this is unsuccessful, on rare occasions the connection must be redone with another operation.

In the sleeve gastrectomy, an area may become narrowed, kinked, or twisted due to scar tissue. This rare complication may sometimes improve with endoscopy and sometimes require another operation.

Dumping syndrome and hypoglycemia

Gastric bypass: common

Sleeve gastrectomy: less common than gastric bypass

Both dumping syndrome and hypoglycemia (low blood sugar) can present similarly and occurs shortly after eating sugar. With dumping syndrome there is a hormonal response that can lead to urgency, cramping, and diarrhea. With hypoglycemia, there is too much insulin production in response to eating sugar, which lowers the blood sugar more than needed. Both dumping syndrome and hypoglycemia can cause sudden nausea, perspiration, weakness and lightheadedness. Symptoms typically resolve over 30 minutes.

Internal hernia, intussusception, and small bowel blockage

Gastric bypass: 3-5% lifelong

Sleeve gastrectomy: almost never

Internal hernias only occur after a gastric bypass. The formation of the jejuno-jejunal (JJ) anastomosis creates several windows (or pockets) between segments of intestine. These pockets are closed with sutures, but at times can separate creating a potential for the intestines to wrap around themselves.

Intussusception only occurs after a gastric bypass. It is due to large diameter portion of bowel swallowing a narrower portion of bowel, much like a sock turned inside out.

Small bowel blockage can also occur due to scar tissue that forms after an operation.

Symptoms of internal hernia, intussusception, and bowel blockage include intense abdominal pain, severe bloating, or persistent nausea and vomiting. Treatment usually requires an urgent operation to fix the underlying problem.

Gallstones

Rapid weight loss, with or without surgery, increases the risk of developing gall stones. This typically occurs within six months of surgery. Gall stones that are associated with right sided abdominal pain may require surgery to remove the gall bladder.

Nutritional or vitamin deficiencies

Because of decreased intake and absorption with both operations, you will be at increased risk for deficiencies after having bariatric surgery. Vitamin deficiencies are very common when people stop taking the recommended vitamins. These deficiencies are usually avoidable by taking the daily required amounts of supplements. Routine follow-up visits after surgery that include blood testing are essential to detect nutritional deficiencies early. Without early detection, some of these deficiencies can lead to severe irreversible disease such as fatigue, tiredness, hair and skin damage, memory loss, nerve damage, and heart damage.

Weight re-gain

Not making the daily lifelong commitment to the proper healthy lifestyle will usually lead to poor initial weight loss or eventual regain in weight. We will review this in more detail in the later chapters.

Kidney stones

Dehydration in the first few months after gastric bypass or gastric sleeve can increase the risk for kidney stones. There is also a malabsorption component to the gastric bypass that may increase the risk of certain types of kidney stones lifelong.

Other side effects and excess skin

With both gastric bypass and sleeve gastrectomy many patients complain of bad breath, flatulence, hair loss, feeling cold, hormonal changes, and mood swings. These side effects tend to occur with the rapid weight loss than occurs in the first year, and usually but not always improve with time. can occur during the first weeks to months after surgery and will improve with time. Other rare side effects such as erosion of the teeth may occur years later.

Significant weight loss with or without weight loss surgery can lead to excess hanging skin around the belly, thighs, and upper arms. Younger people with more elastic skin may have some of the skin shrink, although this is unpredictable. There are no real exercises for skin that can prevent this from happening, and ultimately many people choose to have removal of the skin with plastic surgery. Plastic surgery can be expensive and is not economically possible for many. Occasionally patients who have lost a substantial amount of weight may have their plastic surgery covered by insurance, but this depends on the qualifications determined by the plastic surgeon.

TABLE: Comparison of the Operations

	Gastric Bypass	Sleeve Gastrectomy
		
History	Greater than 30 years	Greater than 10 years
Operation	5-6 Incisions Longer operative time Overnight stay 1:900 risk of death	5-6 Incisions Shorter operative time Overnight stay 1:900 risk of death
Recovery Time	same	same
Vitamins	Vitamins are essential	Vitamins are essential
NSAIDs	Cannot be used due to ulcers	Usually tolerated
Smoking	Can lead to significant ulcers and chronic pain	Can lead to significant ulcers and chronic pain
Drinking	Can lead to significant ulcers and chronic pain	Can lead to significant ulcers and chronic pain
Dumping, Hypoglycemia	Common	Less common
Heartburn	Heartburn symptoms decrease but ulcer symptoms may increase	Heartburn symptoms may decrease or may increase
Diabetes	Improvement due to weight loss and intestinal bypass (esp. insulin dependent type 2 diabetes)	Improvement proportional to weight loss

Re-Operation	1 in 30 re-operations over 5-10 years due to internal hernia's, bowel obstruction, or ulcers	Long term re-operation rate is unknown but is much lower than that of the bypass
Weight Loss	60-70% at 6 years	50-60% at 6 years

How Do I Choose?

It is the goal of our team to make sure you are well educated on the risks, benefits and differences between the operations. We value your independence, goals and preferences. Choosing the operation is best done with your surgeon. This team approach will combine your individual preferences with your surgeons' understanding of how surgery can affect your medical conditions.

In general, if you have difficult to control diabetes or severe heartburn you might lean towards the gastric bypass, but ultimately either operation is acceptable.

If you must take NSAIDS or immunosuppressive medications for pain or an autoimmune condition, you may lean towards the gastric sleeve.

If you have inflammatory bowel disease such as Crohns or Ulcerative colitis, will need to take immunosuppressive medications for an organ transplant, or have significant scar tissue involving your small intestine, the sleeve gastrectomy might be the only safe option.

Chapter 4. Preparation Before Surgery

Preparing for Weight Loss Surgery

Having an operation will not lead to weight loss unless you understand how to use the operation correctly. You need to establish a lifelong healthy routine that will help with weight loss before and after the operation.

- Educate yourself
 - More information is better than less information. Continue to read this book. Research information on the internet or other books. Talk to people who have had weight loss surgery as much as possible.
 - Use resources and apps to help you (Book 2 Chap7)
- Attend Support Groups (Book 2 Chap 5)
- Improve your nutrition (Book 2 Chap 2)
 - Make healthy food choices
 - Keep accurate food logs and calorie counts
 - Practice mindful eating
- Start supplements (Book 2 Chap 3)
 - Try different supplements to see which ones you prefer
 - Start you supplements at least one month prior to the operation, and earlier if you know you already have a deficiency.
- Exercise (Book 2 Chap 4)
 - Start a regular exercise program
 - Move throughout the day as much as possible.
- Lose weight
 - Helps you figure out which changes will lead to the best weight loss
 - Improves your existing medical conditions to lower risk
 - Gives you a head start on your weight loss journey
 - Leads to better long-term success with keeping the weight off

Hospitalization

Both the sleeve gastrectomy and the gastric bypass require an overnight stay. On the day of operation, you will check in at the Admissions Office. Please be on time. After you check in, you will be taken to the pre-surgical holding area where your nurse will take a brief medical history and start an IV line. Both your surgeon and anesthesiologist will come speak to you. Once the pre-surgery checklist is complete and the operating room is ready, you will be taken to the operating room and asked to transfer over to the operating room table. A surgical briefing will be conducted to confirm your identity and operation to be performed. Each member of the surgical team will confirm they are ready to proceed. Anesthesia will then be induced. Some patients report feeling a burning sensation in the IV lasting only a few seconds. Before you know it, surgery is finished, and you will be transferred to the recovery room and finally to your hospital room.

Most patients spend one night in the hospital and are discharged the next day. On the same day of your surgery you will be helped with walking. Walking is important to ensure you have good blood flow to prevent blood clots. You will also be encouraged to take deep breaths to prevent lung infections. You will be given medications for pain and nausea. Once you are able to take liquids and pain medications by mouth, you will be discharged home. You will be provided with detailed discharge instructions which include a section listing your previous and new medications. Keep in mind that fatigue after surgery is the most common complaint. This is normal and will last about 4 weeks.

The first month

The first month after weight loss surgery is often the hardest. During this time, you may feel many of the following symptoms:

- Tiredness, weakness, and fatigue as your body adjusts to the very low-calorie diet and tries to heal at the same time
- Intermittent nausea, bloating, cramps, and gas pains
- Intermittent pain of the incisions with movement
- Dehydration and occasional dizziness as you go from lying to standing
- Constipation or diarrhea
- Weight loss!

Diet

You will progress slowly over the first month from a liquid to soft solid diet. This will be explained in detail in the Nutrition chapter.

Activity

Your post-operative instructions will give you guidance about any restrictions on your activity and when you can resume full exercise. Your incisions are usually waterproof and healed by two weeks but will need a six to eight weeks to heal completely.

Complications

Early complications after an operation include leak, bleeding, and blood clots. Your postoperative instructions will include information on how to recognize these issues. If you think you have a complication and need to go to the emergency room, you can go to the most convenient Kaiser emergency room. The doctors there can contact the bariatric surgeon as needed. In the very rare instance, you have a complication that requires the care of your bariatric surgeon, the emergency room will transfer you by ambulance to the bariatric center.