Bariatric and Metabolic Surgery

Choosing the right procedure for you

Realize®

What Is Your BMI?

Height \ Weight (lbs)	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350
5'0"	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	62	64	66	68
5'2"	22	24	26	27	29	31	33	35	37	38	40	42	44	46	48	49	51	53	55	57	59	60	62	64
5'4"	21	22	24	26	28	29	31	33	34	36	38	40	41	43	45	46	48	50	52	53	55	57	58	60
5'6"	19	21	23	24	26	27	29	31	32	34	36	37	39	40	42	44	45	47	49	50	52	53	55	56
5'8"	18	20	21	23	24	26	27	29	30	32	34	35	37	38	40	41	43	44	46	47	49	50	52	53
5'10"	17	19	20	22	23	24	26	27	29	30	32	33	35	36	37	39	40	42	43	44	46	47	49	50
6'0"	16	18	19	20	22	23	24	26	27	29	30	31	33	34	35	37	38	39	41	42	43	45	46	47
6'2"	15	17	18	19	21	22	23	24	26	27	28	30	31	32	33	35	36	37	39	40	41	42	44	45
6'4"	15	16	17	18	20	21	22	23	24	26	27	28	29	30	32	33	34	35	37	38	39	40	41	43

- Underweight — BMI: < 18.5
- Healthy weight — BMI: 18.5 to 24.9
- Overweight — BMI: 25 to 29.9
- Class I obesity — BMI: 30 to 34.9
- Class II obesity — BMI: 35 to 39.9
- Class III severe obesity — BMI: ≥ 40

Chart based on information from the American Society for Metabolic and Bariatric Surgery.
http://asmbs.org/calculate-your-bmi/

Health Risks of Obesity

What Is Your BMI?

Height	Weight (lbs)																							
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Health Risks of Obesity

Benefits of Bariatric and Metabolic Surgery

How bariatric and metabolic surgery can improve your life

Bariatric and metabolic surgery help you to make the following changes:

- Decrease food intake
- Lose excess weight
- Take control of your overall health

Many obesity-related health conditions may be improved or resolved, including:

- Type 2 diabetes
- High blood pressure/heart disease
- Osteoarthritis of weight-bearing joints
- Obstructive sleep apnea
- Gastroesophageal reflux/heartburn
- Infertility/menstrual dysfunction
- Stress urinary incontinence
- Dyslipidemia (lipid metabolism abnormalities)

Overall quality of life for bariatric surgery patients improves greatly. Patients have experienced improvements in many areas of their lives:

- Physical functioning and appearance
- Social opportunities
- Economic opportunities[1]

For an explanation of the risks of bariatric surgery, see the Risks of Abdominal Surgery tab.

There are multiple types of bariatric surgery:

- Gastric bypass
- Sleeve gastrectomy
- Gastric banding

Type 2 diabetes: A disorder of glucose and insulin metabolism.

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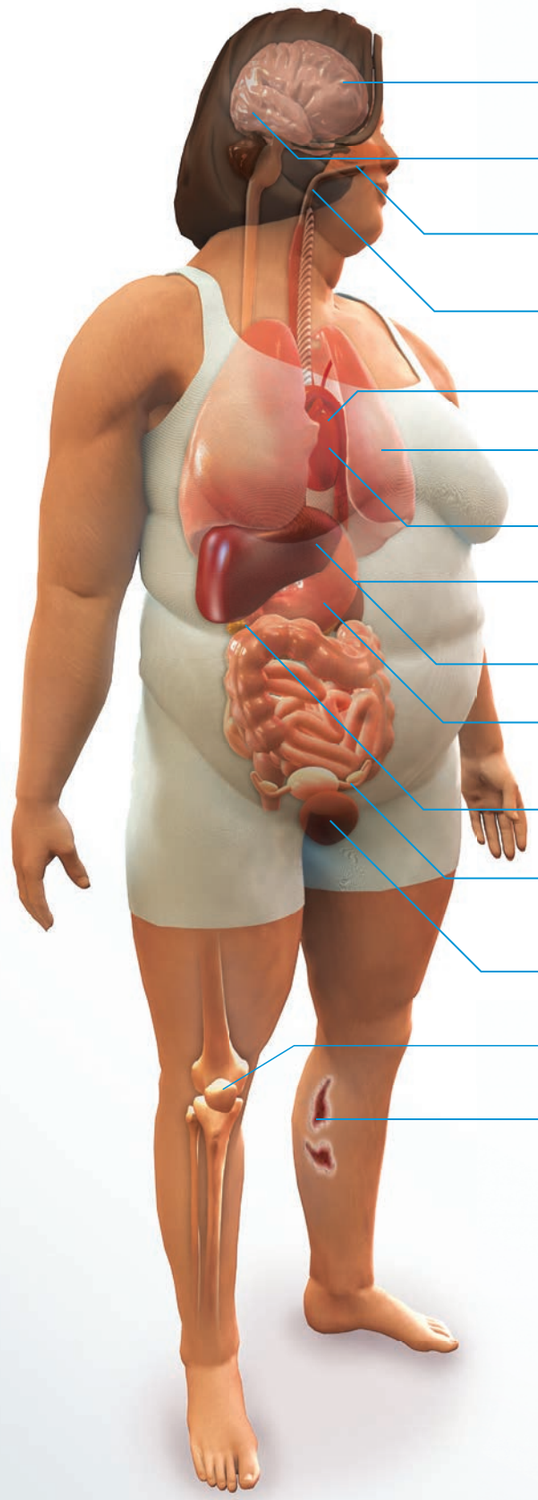
Resolution of Obesity-Related Disease After Bariatric and Metabolic Surgery



Migraines
46% improved[2]

Depression
47% reduced[3]

Pseudotumor cerebri
96% resolution of headaches[4]
95% resolution of pulsatile tinnitus[4]

Obstructive sleep apnea
45% to 76% resolved[5,6]

High cholesterol
71% to 94% improved[1*]

Asthma
39% resolved[7]

High blood pressure
42% to 66% resolved[5,6,8]

Nonalcoholic fatty liver disease
37% resolution of steatosis[9]

Metabolic syndrome
80% resolved[9]

GERD
72% to 95% resolved[3,10]

Type 2 diabetes
45% to 68% resolved[5,11]

Polycystic ovarian syndrome
52% resolution of hirsutism[12]
100% resolution of menstrual dysfunction[12]

Urinary stress incontinence
50% resolved[13]

Osteoarthritis/degenerative joint disease
41% resolved[3]

Venous stasis disease
95% resolution of venous stasis ulcers[14]

*Figure is for hyperlipidemia. Hyperlipidemia is a general term for high fats in blood, which may include cholesterol and / or triglycerides.

There are different types of bariatric surgery procedures, and your outcomes may vary depending on the type of procedure (as indicated in the ranges provided above). Please talk with your doctor about potential surgical outcomes related to your procedure.

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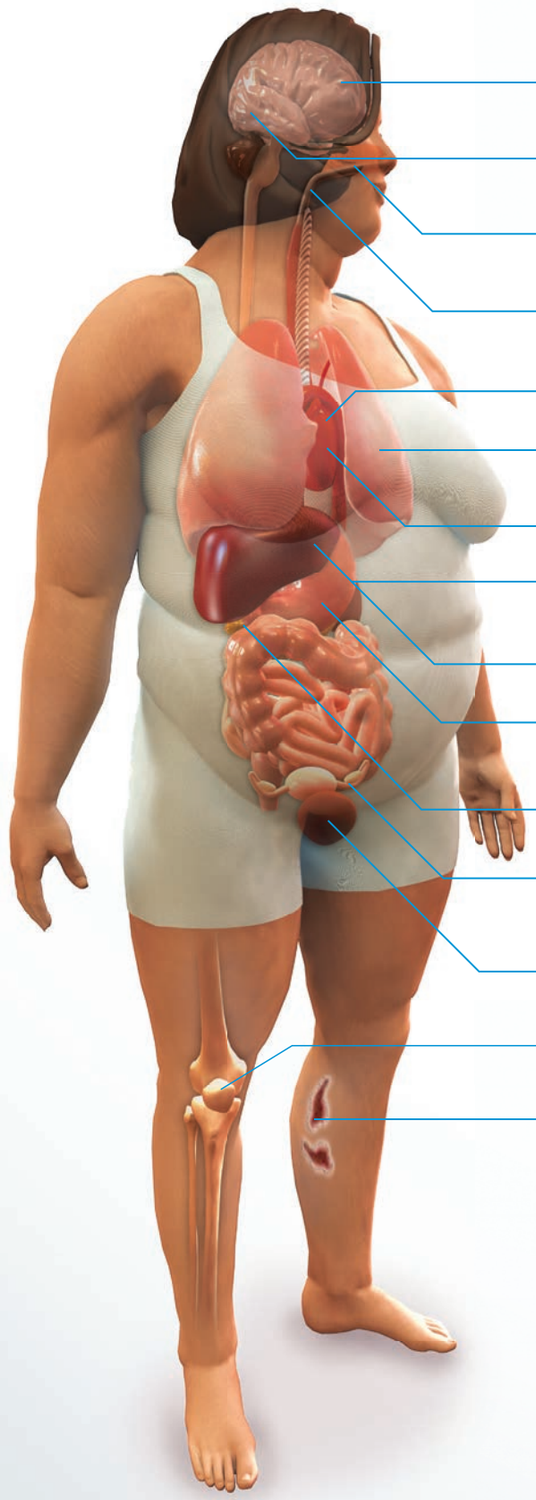

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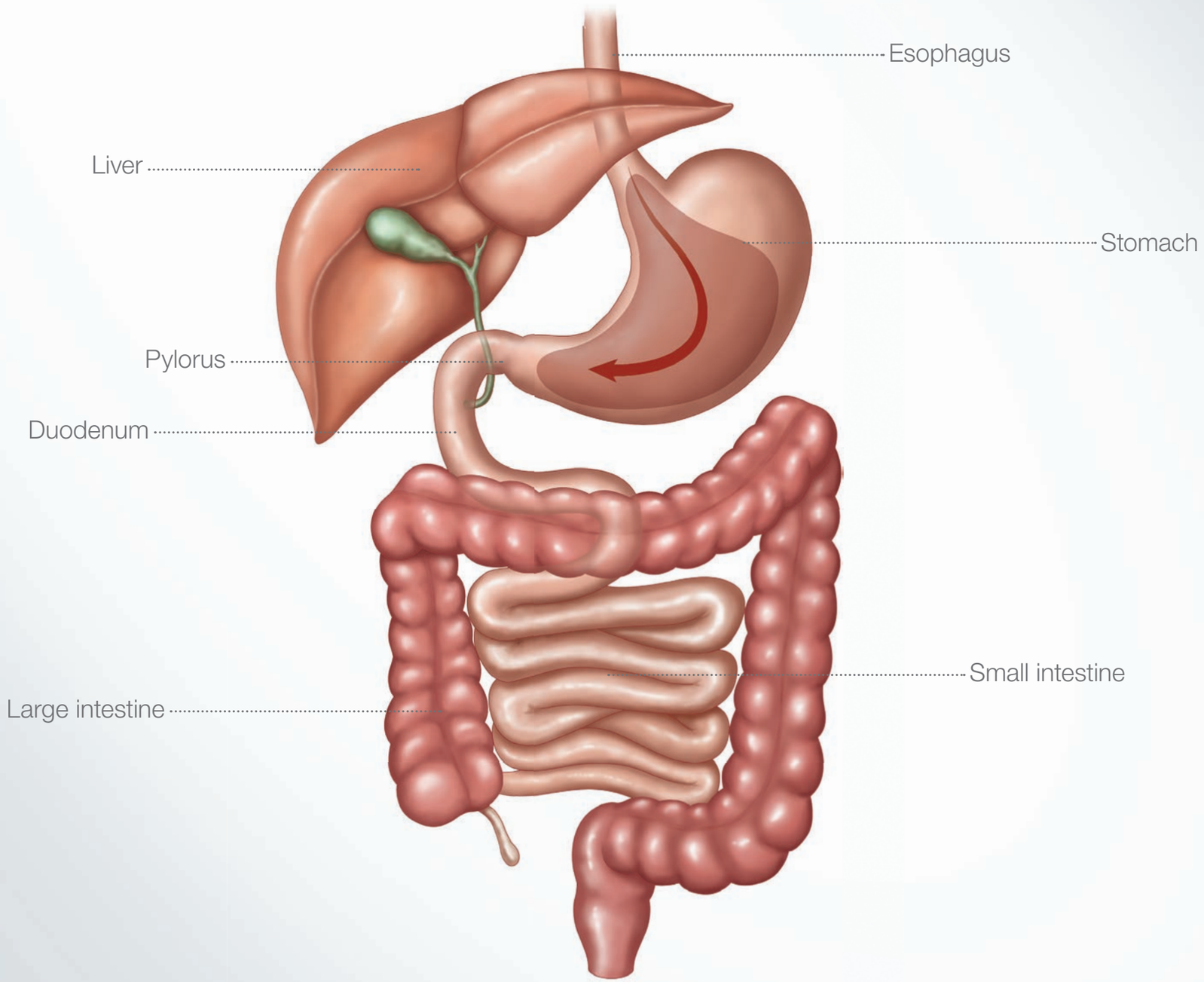
Understanding the Gastrointestinal Anatomy



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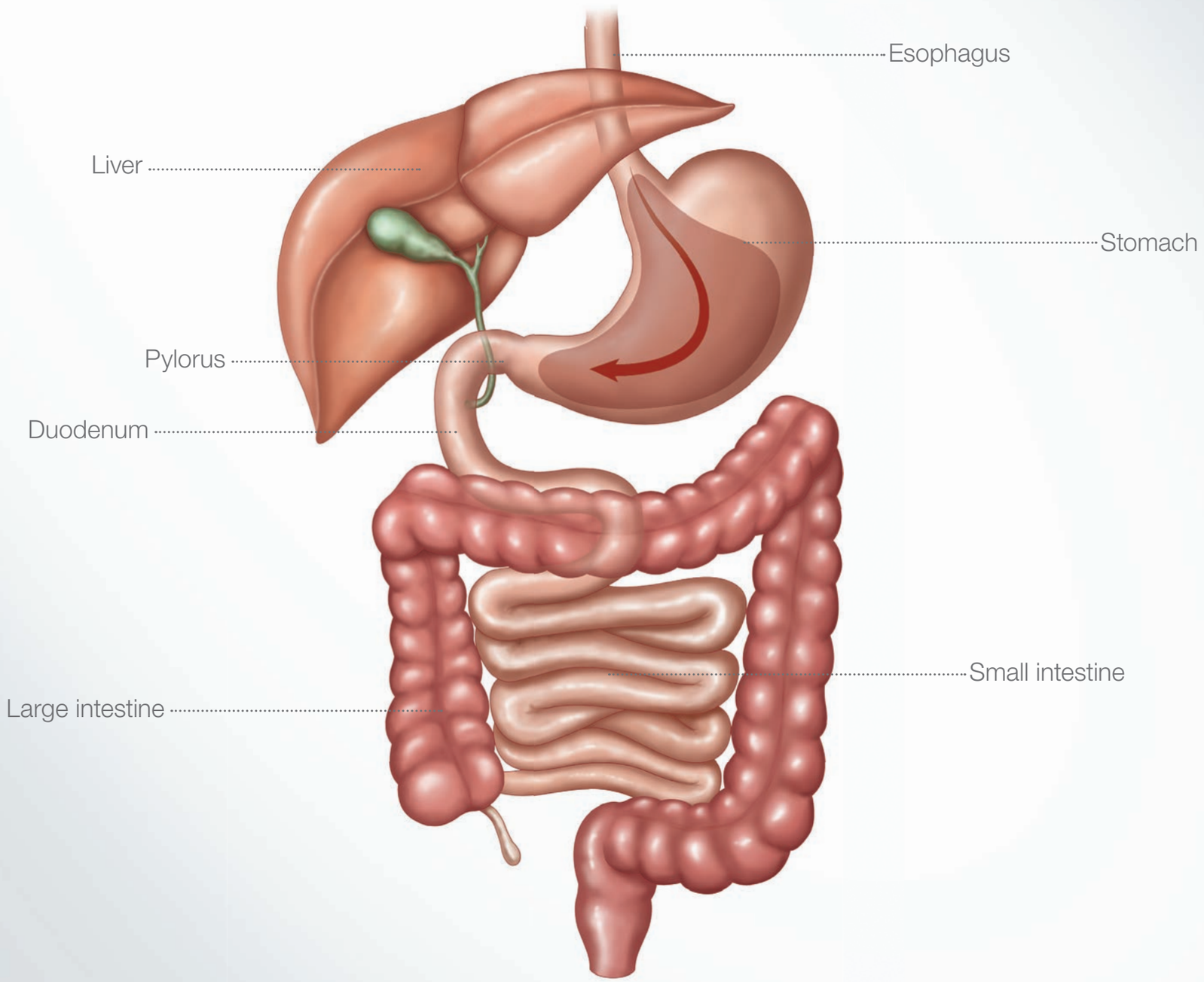
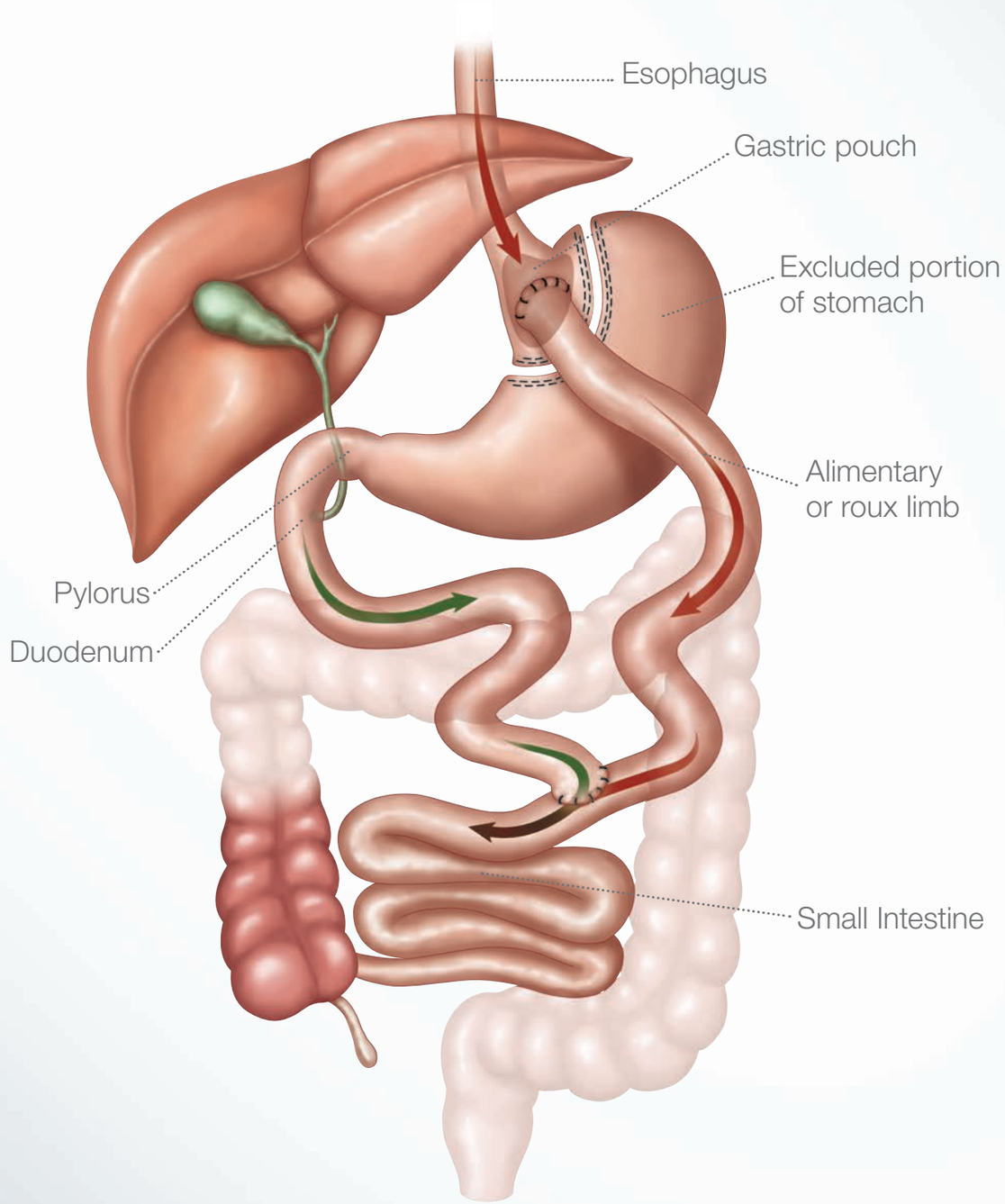


Roux-en-Y Gastric Bypass



Roux-en-Y gastric bypass

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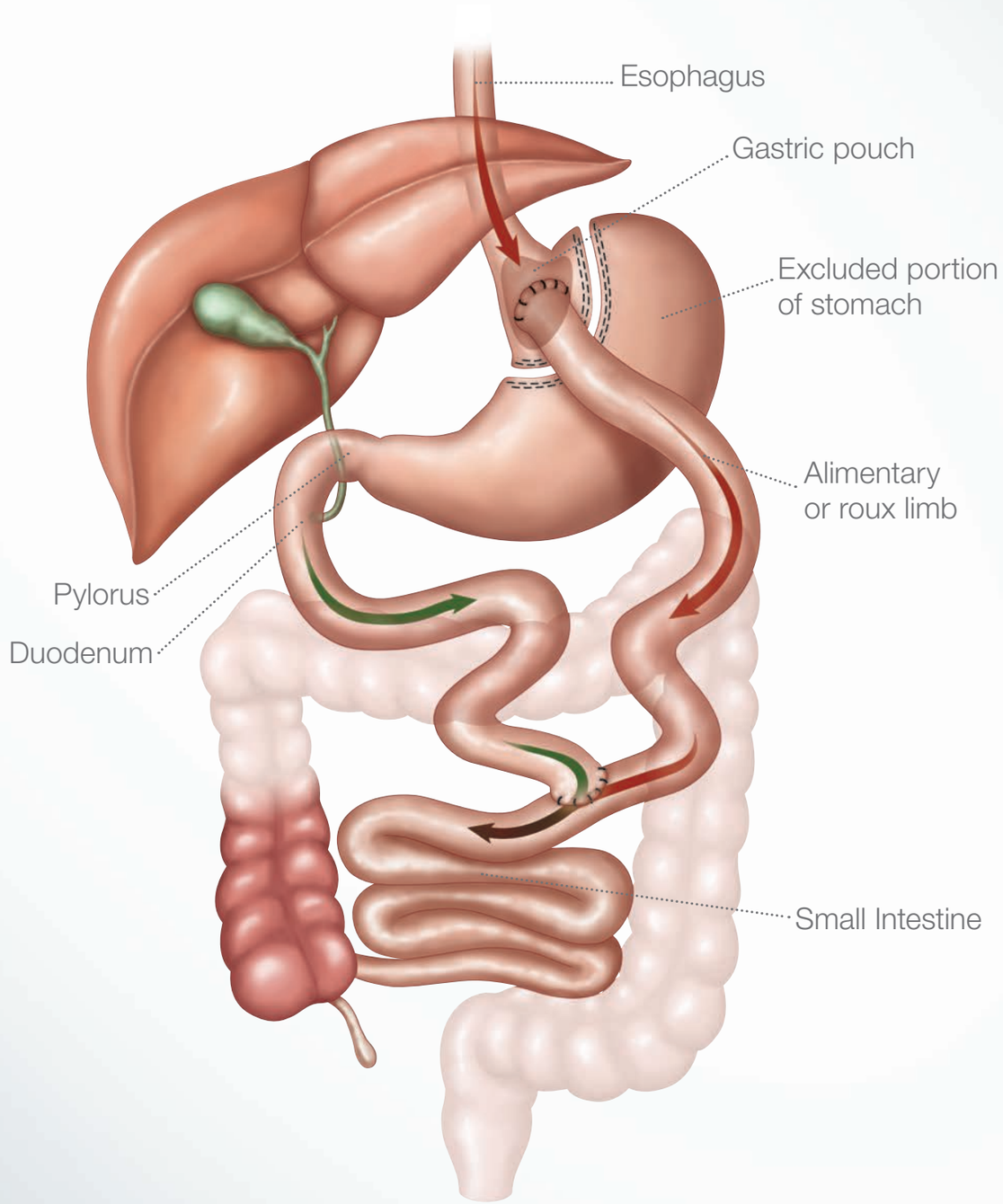

Roux-en-Y gastric bypass

Roux-en-Y Gastric Bypass

How does it work?

During the procedure, the surgeon creates a small stomach pouch. The surgeon then attaches a section of the small intestine directly to the pouch. This allows food to bypass a portion of the small intestine, which absorbs calories and nutrients. Having the smaller stomach pouch causes patients to feel full sooner and eat less food; bypassing a portion of the small intestine means the patient's body absorbs fewer calories. Like other metabolic surgeries, it also helps to establish a lower, healthier body fat set point by changing the signals between the stomach, brain, and liver.[15]

What are the benefits?

Patients report an early sense of fullness and satisfaction that reduces the desire to eat. Patients who have gastric bypass generally lose more weight sooner than patients who undergo purely restrictive procedures.

Gastric bypass patients can also experience dumping syndrome. This syndrome is a rapid movement of food through the small intestine that leaves the patient feeling flushed and uncomfortable, but it may also be seen as a benefit, as it provides important warning signs that too much sugar or food is being consumed.

What are the risks, complications, and side effects?

Additional risks and complications associated with Roux-en-Y gastric bypass include:

- Dehiscence (separation of tissue that was stitched or stapled together)
- Leaks from staple lines
- Ulcers
- Dumping syndrome, an unpleasant side effect that may include vomiting, nausea, weakness, sweating, faintness, and diarrhea
- Required supplementation of diet with a daily multivitamin, calcium, and sometimes vitamin B12 and/or iron
- Inability to detect the stomach, duodenum and parts of the small intestine using X-ray or endoscopy should problems arise after surgery, such as ulcers, bleeding, or malignancy
- Increased gas

Stapled: Surgical staples, similar in look and function to those used to fasten paper, are used for connecting tissue. Staples are usually permanent and made of titanium.

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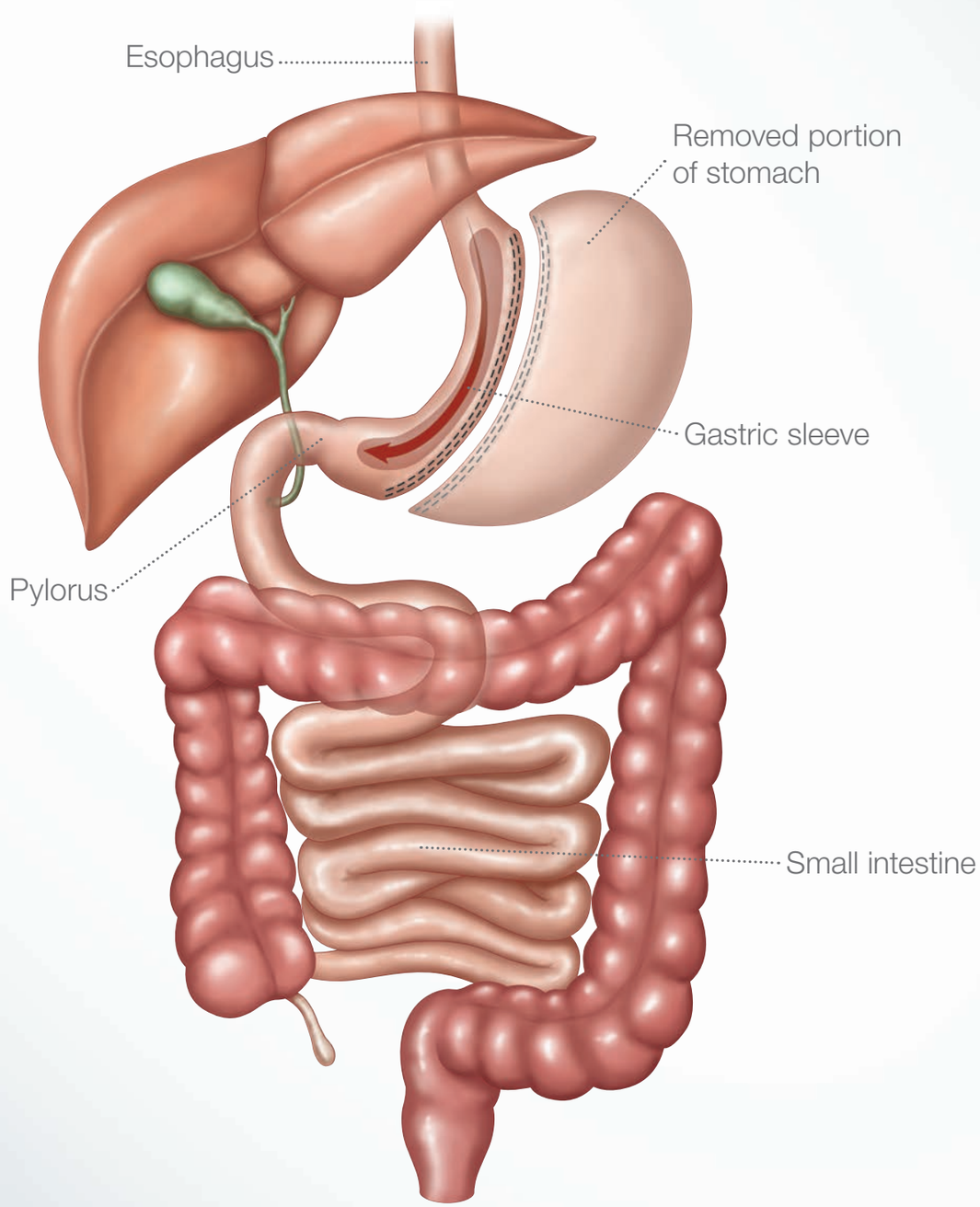
Roux-en-Y gastric bypass

Vertical Sleeve Gastrectomy



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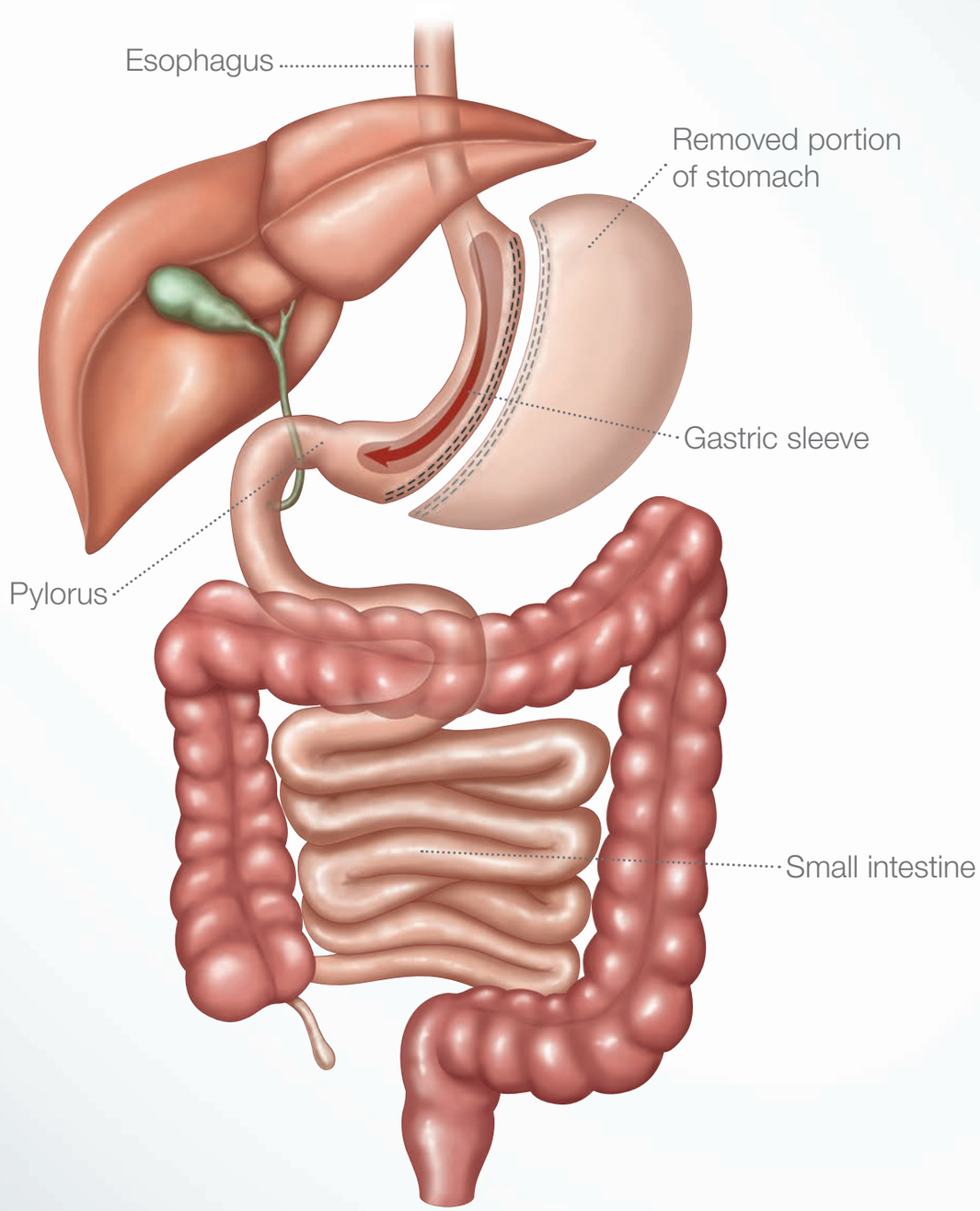

Vertical sleeve gastrectomy

Vertical Sleeve Gastrectomy

How does it work?

During this procedure a thin vertical sleeve of stomach is created using a stapling device. The sleeve is about the size of a banana. The excised portion of the stomach is removed. Food passes through the digestive tract in the usual way, allowing vitamins and nutrients to be fully absorbed into the body. Like other metabolic surgeries, it also helps to establish a lower, healthier body fat set point by changing the signals between the stomach, brain, and liver.[15]

What are the benefits?

A sleeve gastrectomy limits the amount of food you can eat by permanently reducing the size of your stomach. As a result, you feel full with less food and stay satisfied longer.

What are the risks, complications, and side effects?

Additional risks and complications associated with vertical sleeve gastrectomy include:

- Dehiscence (separation of tissue that was stitched or stapled together)
- Leaks from staple lines
- Ulcers
- Dyspepsia
- Esophageal dysmotility
- Fistula

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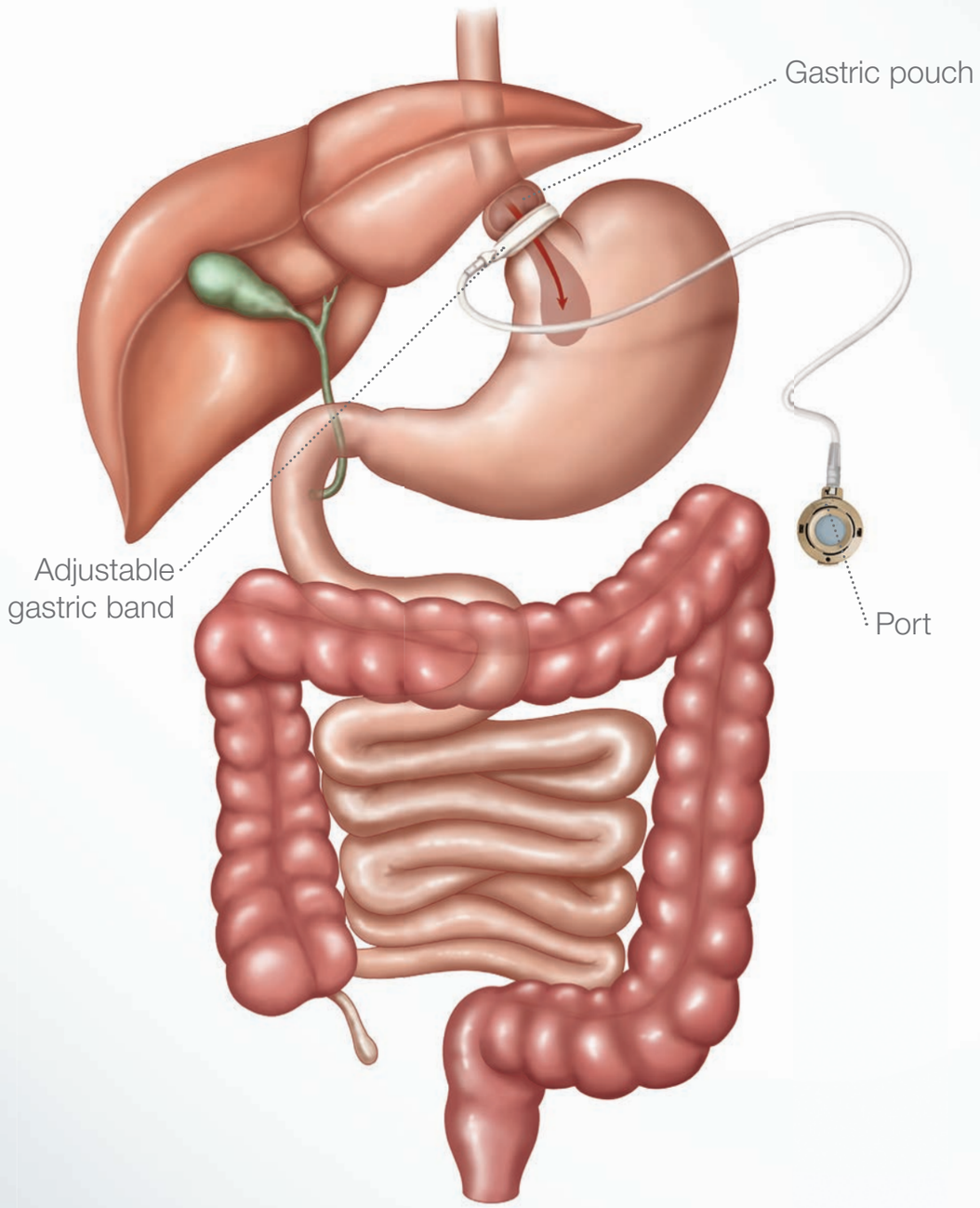
Adjustable Gastric Banding



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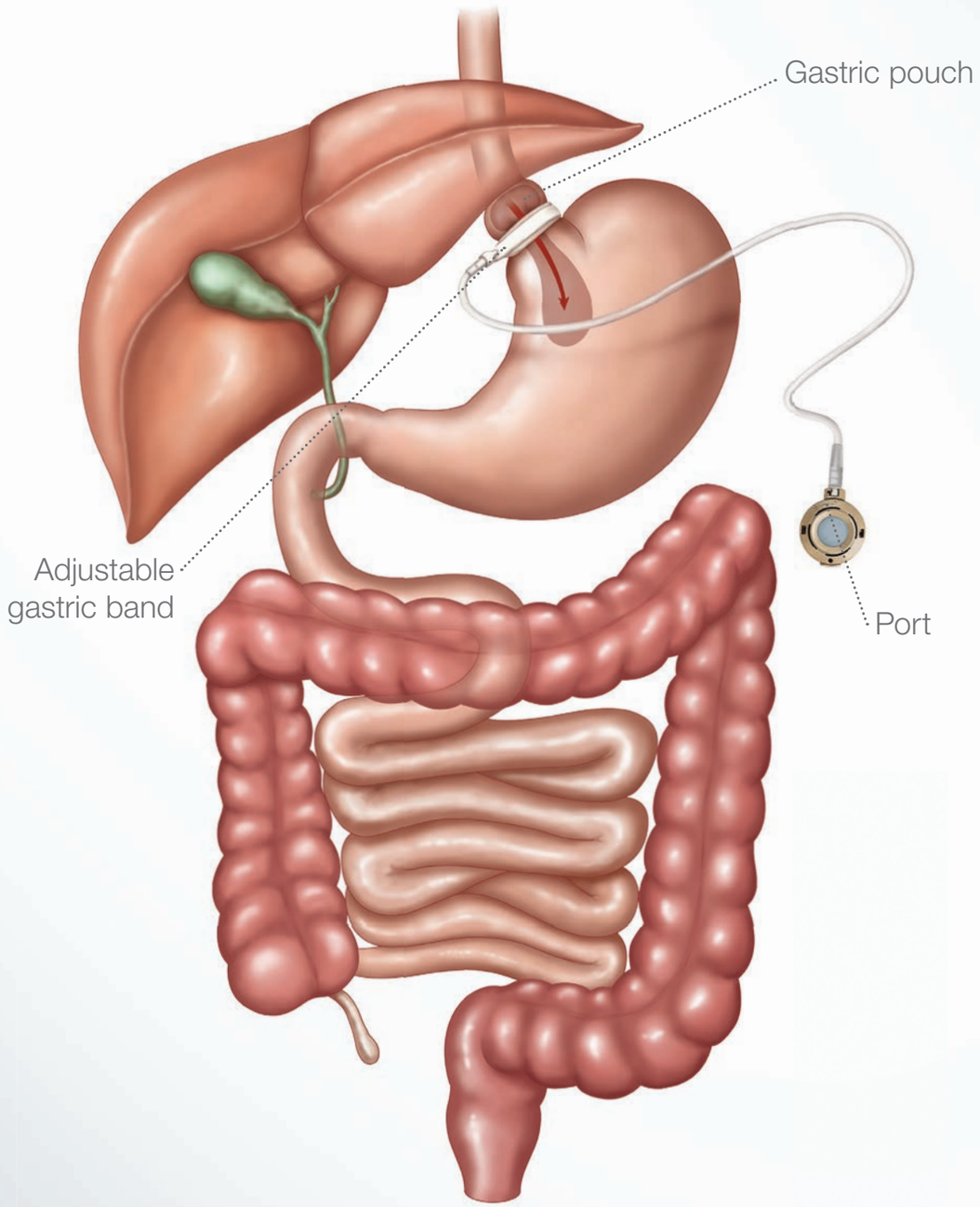

Adjustable gastric banding

Adjustable Gastric Banding

How does it work?

A silicone band is placed around the upper part of the stomach to create a small upper pouch and lower stomach. To control the tightness around your stomach, saline is delivered through an injection port and tubing connected to the band. The injection port is attached to the abdominal wall during surgery.[15]

What are the benefits?

Gastric banding limits the amount of food you can eat at one time. For this reason, you will feel full sooner than usual. The stomach created by the band also slows the flow of food from the small upper stomach to the lower stomach. This means you will feel full sooner and stay full longer, and you will have better control of your appetite.

When the band fits properly and is filled adequately, it helps you feel satisfied and full with minimal discomfort. Your health care team will determine when adjustments to your band are needed. You will quickly learn how to eat to avoid discomfort and regurgitation. As you eat less food, your body will stop storing excess calories and begin to use its fat energy stores.

What are the risks, complications, and side effects?

Additional risks and complications associated with gastric banding include:

- Migration of implant (band erosion, band slippage, and port displacement)
- Tubing-related complications (port disconnection and tubing kinking)
- Band leak
- Esophageal spasm
- Gastroesophageal reflux disease (GERD)
- Inflammation of the esophagus or stomach
- Port-site infection

Other nonserious complications also were reported in a U.S. clinical study.[16] None of these complications are usually life threatening. To learn more about the U.S. clinical study, visit **REALIZE.com**

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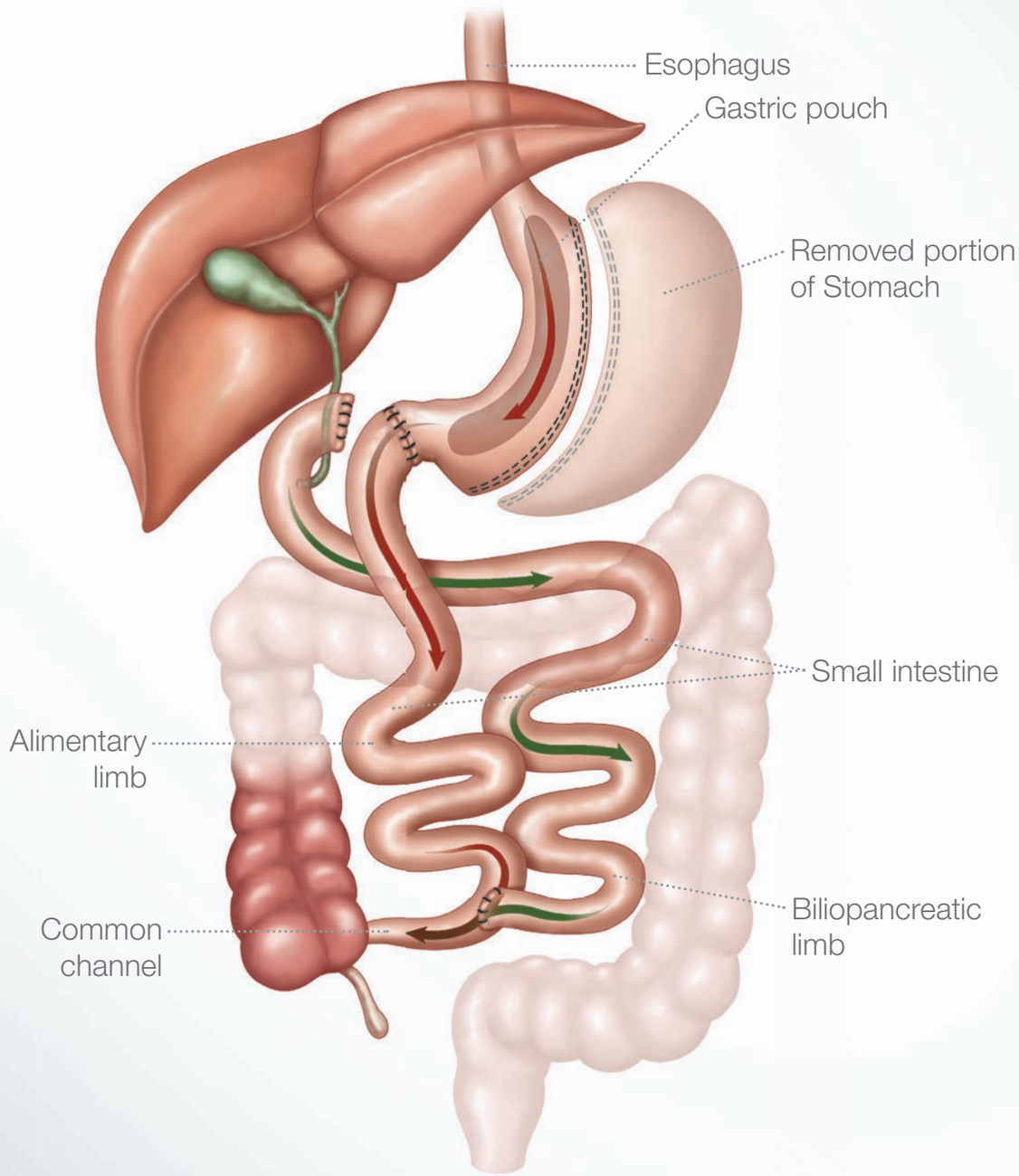
Biliopancreatic Diversion with Duodenal Switch (BPD/DS)



Biliopancreatic diversion with duodenal switch

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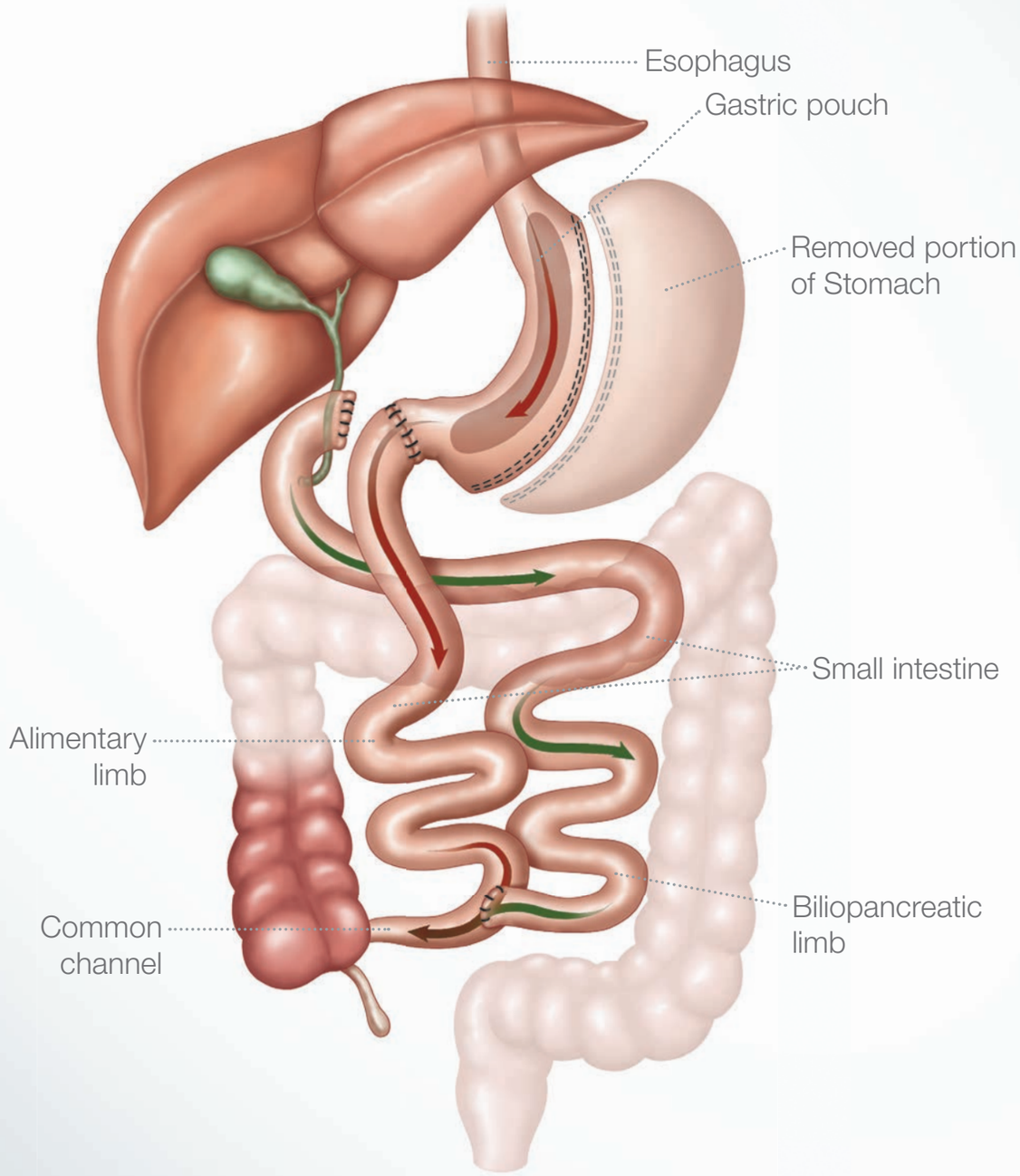

Biliopancreatic diversion with duodenal switch

Biliopancreatic Diversion with Duodenal Switch

How Does It Work?

Biliopancreatic diversion with duodenal switch (BPD/DS) is similar to gastric bypass. Instead of a small stomach pouch, the surgeon creates a sleeve-shaped stomach. The surgeon then attaches the final section of the small intestine to the stomach sleeve. The small intestine absorbs calories and nutrients. Bypassing all but the last section of the small intestine causes far fewer calories to be absorbed than with normal anatomy. Like other metabolic surgeries, it also helps to establish a lower, healthier body fat set point by changing the signals between the stomach, brain, and liver.[16]

What Are the Benefits?

Patients report less restriction on consumed food than with other bariatric procedures. BPD/DS studies also show that this procedure results in the greatest weight loss because it provides the highest levels of malabsorption and has the highest rate of resolution of type 2 diabetes and hyperlipidemia.

What are the risks, complications, and side effects?

- Dehiscence (separation of tissue that was stitched or stapled together)
- Leaks from staple lines
- Ulcers
- Required supplementation of diet with a daily multivitamin, calcium, and sometimes B12 and/or iron
- Inability to detect the duodenum and parts of the small intestine using X-ray or endoscopy should problems arise after surgery, such as ulcers, bleeding, or malignancy
- Abdominal bloating and foul-smelling stool or gas

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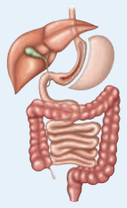
Biliopancreatic diversion with duodenal switch

Comparison of Surgical Procedures

		Procedure description	How it works to help you lose weight	How it affects digestion	Total percent excess body weight lost (at 3 years)	HEALTH BENEFITS SHOWN IN CLINICAL TRIALS					
						Type 2 diabetes	High blood pressure	High cholesterol	Obstructive sleep apnea	Average surgery time	Length of hospital stay
GASTRIC BANDING		The adjustable gastric band wraps around the upper part of the stomach, dividing the stomach into a small upper pouch that holds about ½ cup of food and a larger lower stomach. The degree of band tightness affects how much food you can eat and the length of time it takes for food to leave the stomach pouch.	By creating a smaller stomach pouch, the band limits the amount of food that can be eaten at one time, so you feel full sooner and stay full longer. As you eat less food, your body will stop storing excess calories and start using its fat supply for energy.	Does not significantly alter normal digestion and absorption. Food passes through the digestive tract in the usual order, allowing it to be fully absorbed in the body.	41%[16]	20-59% controlled[1,5,21,22*]	42% resolved[8]	71% improved[8]	45% resolved[5]	1 to 2.5 hours[5]	1 to 3 days[5]
SLEEVE GASTRECTOMY		During the sleeve gastrectomy procedure, a thin vertical sleeve of stomach is created using a stapling device. The sleeve is about the size of a banana. The rest of the stomach is removed.	By creating a smaller stomach pouch, a sleeve gastrectomy limits the amount of food that can be eaten at one time, so you feel full sooner and stay full longer. As you eat less food, your body will stop storing excess calories and start using its fat supply for energy.	Does not significantly alter normal digestion and absorption. Food passes through the digestive tract in the usual order, allowing it to be fully absorbed in the body.	66%[17]	45-58% controlled[22,23,24*]	50% resolved[6]	77% improved[18]	60% resolved[6]	1.5 to 3.5 hours[19]	2 to 12 days[19]
GASTRIC BYPASS		In this procedure, the surgeon creates a small stomach pouch using a stapling device and attaches a section of the small intestine directly to the pouch. This allows food to bypass a portion of the small intestine.	By creating a smaller stomach pouch, a gastric bypass limits the amount of food that can be eaten at one time, so you feel full sooner and stay full longer. By bypassing a portion of the small intestine, your body also absorbs fewer calories. As you eat less food and absorb fewer calories, your body will stop storing excess calories and start using its fat supply for energy.	Reduces the amount of calories (in the form of nutrients) absorbed.	62%[20]	60-84% controlled[1,5,21,23,25,26*]	66% resolved[20]	94% resolved[1]	76% resolved[5]	2 to 3.7 hours[5]	2 to 8 days[5]

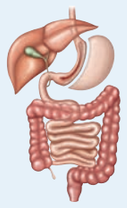
Important safety information

Bariatric surgery is used in morbidly obese adult patients for significant long-term weight loss. It may not be right for individuals with certain digestive tract conditions. All surgery presents risks. Weight, age and medical history determine your specific risks. Ask your doctor if bariatric surgery is right for you. For potential risks associated with other bariatric procedures, please visit REALIZE.com/potentialrisks.

Resolution statistics above reflect observations in the confines of studies; EES has no independent data to suggest permanent resolution.

*Diabetes controlled in patients without medications. Control of diabetes is defined as HbA1c ≤7.0%

Comparison of Surgical Procedures

		Procedure description	How it works to help you lose weight	How it affects digestion	Total percent excess body weight lost (at 3 years)	HEALTH BENEFITS SHOWN IN CLINICAL TRIALS					
						Type 2 diabetes	High blood pressure	High cholesterol	Obstructive sleep apnea	Average surgery time	Length of hospital stay
GASTRIC BANDING		The adjustable gastric band wraps around the upper part of the stomach, dividing the stomach into a small upper pouch that holds about ½ cup of food and a larger lower stomach. The degree of band tightness affects how much food you can eat and the length of time it takes for food to leave the stomach pouch.	By creating a smaller stomach pouch, the band limits the amount of food that can be eaten at one time, so you feel full sooner and stay full longer. As you eat less food, your body will stop storing excess calories and start using its fat supply for energy.	Does not significantly alter normal digestion and absorption. Food passes through the digestive tract in the usual order, allowing it to be fully absorbed in the body.	41%[16]	20-59% controlled[1,5,21,22*]	42% resolved[8]	71% improved[8]	45% resolved[5]	1 to 2.5 hours[5]	1 to 3 days[5]
SLEEVE GASTRECTOMY		During the sleeve gastrectomy procedure, a thin vertical sleeve of stomach is created using a stapling device. The sleeve is about the size of a banana. The rest of the stomach is removed.	By creating a smaller stomach pouch, a sleeve gastrectomy limits the amount of food that can be eaten at one time, so you feel full sooner and stay full longer. As you eat less food, your body will stop storing excess calories and start using its fat supply for energy.	Does not significantly alter normal digestion and absorption. Food passes through the digestive tract in the usual order, allowing it to be fully absorbed in the body.	66%[17]	45-58% controlled[22,23,24*]	50% resolved[6]	77% improved[18]	60% resolved[6]	1.5 to 3.5 hours[19]	2 to 12 days[19]
GASTRIC BYPASS		In this procedure, the surgeon creates a small stomach pouch using a stapling device and attaches a section of the small intestine directly to the pouch. This allows food to bypass a portion of the small intestine.	By creating a smaller stomach pouch, a gastric bypass limits the amount of food that can be eaten at one time, so you feel full sooner and stay full longer. By bypassing a portion of the small intestine, your body also absorbs fewer calories. As you eat less food and absorb fewer calories, your body will stop storing excess calories and start using its fat supply for energy.	Reduces the amount of calories (in the form of nutrients) absorbed.	62%[20]	60-84% controlled[1,5,21,23,25,26*]	66% resolved[20]	94% resolved[1]	76% resolved[5]	2 to 3.7 hours[5]	2 to 8 days[5]

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Incision Types for Bariatric Surgery

Figure 1: Incisions for laparoscopic bariatric surgery*

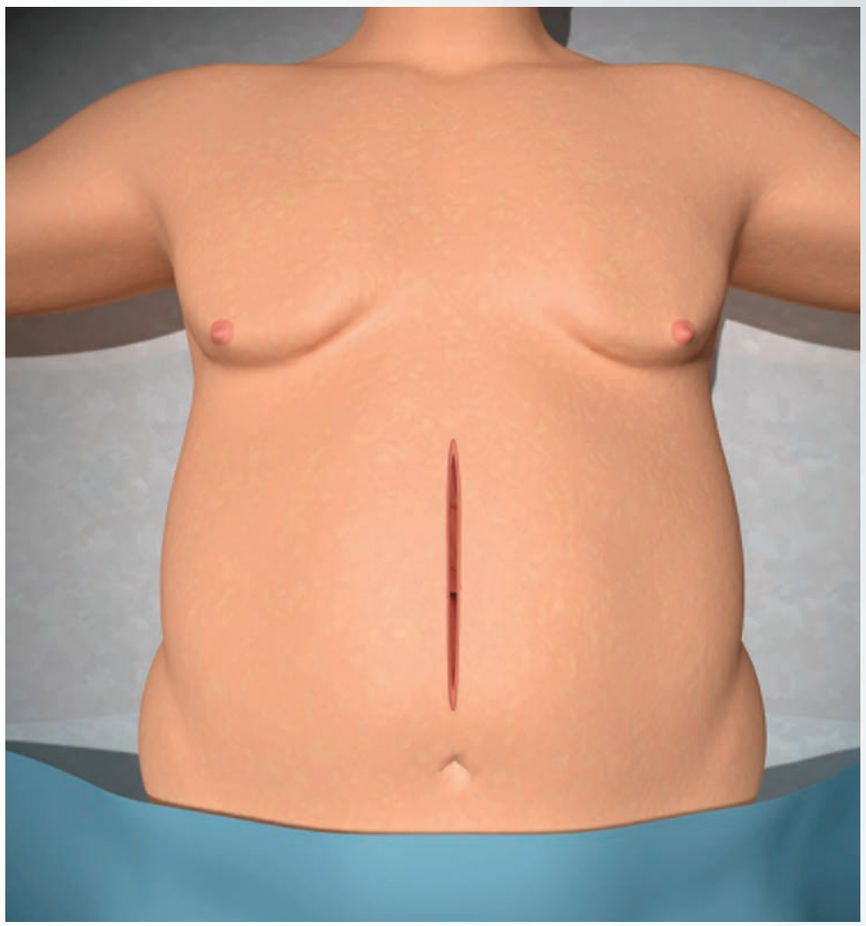

Figure 2: Incisions for open bariatric surgery*

*The location, number, and size of incisions may vary from surgeon to surgeon.

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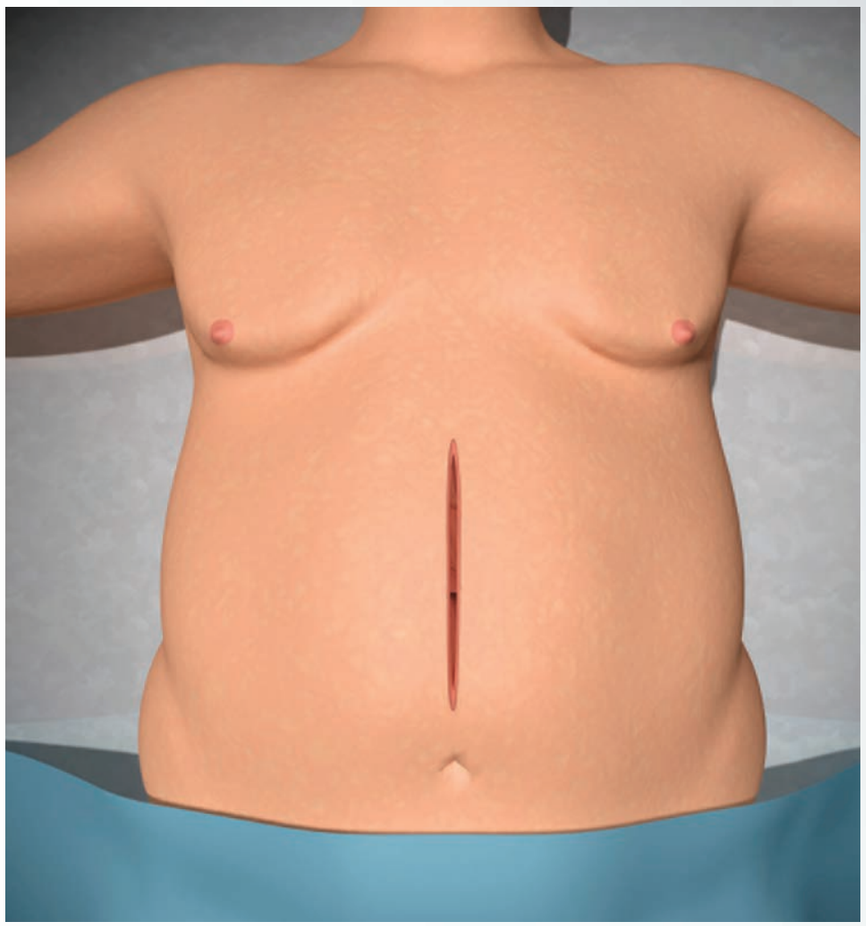

Figure 2: Incisions for open bariatric surgery*

*The location, number, and size of incisions may vary from surgeon to surgeon.

Risks of Abdominal Surgery

Risks associated with abdominal surgery

There are risks associated with abdominal surgery. You can think of risks in the following way: some are associated with surgery, some are specific to a particular bariatric procedure, and some may be unique to you. If you have health conditions such as heart disease or diabetes, or if you are on certain medications (such as blood-thinning medications) or have had other surgeries, your surgeon will inform you about your specific risks for bariatric surgery.

Risks associated with any general abdominal surgery include:

- Bleeding
- Pain
- Shoulder pain
- Pneumonia
- Complications due to anesthesia and medications
- Deep vein thrombosis
- Injury to the stomach, esophagus, or surrounding organs
- Infection
- Pulmonary embolism
- Stroke or heart attack
- Death

Risks associated with bariatric and metabolic surgery

Risks associated with all bariatric surgeries include:

- Abdominal hernia
- Chest pain
- Collapsed lung
- Constipation or diarrhea
- Dehydration
- Enlarged heart
- Gallstones, pain from passing a gallstone, inflammation of the gallbladder, or surgery to remove the gallbladder
- Gastrointestinal inflammation or swelling
- Stoma obstruction
- Stretching of the stomach
- Surgical procedure repeated
- Vomiting and nausea

Abdominal: Referring to the part of the body between the ribs and the pelvis that encloses the viscera.

Deep vein thrombosis: Blood clot.

Pulmonary embolism: A sudden blockage of a lung artery by material circulating in the blood; most often a blood clot from a deep vein in the lung or pelvis.

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