



FACTS ABOUT OBESITY SURGERY

INFORMATION ON YOUR
TREATMENT ALTERNATIVES

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INTRODUCTION

If you are reading this brochure, either you or someone you know might be considering obesity surgery. You have probably made several attempts to lose weight through diet, exercise, medication, psychotherapy or group therapy. You might have lost weight, only to put it back on. And you have now decided to conquer your obesity and regain your health. Obesity surgery is an effective treatment for morbid obesity, with excellent long-term results. However, you must take all possible factors into consideration when making your decision. This brochure is the first in the series “Your new life can start today!”, which is divided into two parts:

- [Facts on obesity surgery](#)
- [Your future – now](#)

This brochure – “Facts on obesity surgery” – gives you the full picture of the advantages, disadvantages and risks of obesity surgery.

Please bear in mind that the information in this brochure is not intended to replace the opinions or advice of a qualified physician. Your best source of information is a surgeon with experience in obesity surgery and his or her team.

GET TO KNOW YOURSELF BETTER – START WITH YOUR BMI (BODY MASS INDEX)

The first thing you need to do is find out if you are overweight and, if so, by how much. There is a proven method for doing this – BMI (Body Mass Index). BMI shows the relationship between a person’s weight and his or her height (weight/height²). Find your BMI:

	UNDERWEIGHT	NORMAL			OVERWEIGHT	OBESE			MORBID OBESITY		
WEIGHT (KG)	HEIGHT (METERS)										
	1.47	1.52	1.57	1.63	1.68	1.73	1.78	1.83	1.88	1.93	1.98
65	30.1	28.1	26.4	24.5	23.0	21.7	20.5	19.4	18.4	17.5	16.6
68	31.5	29.4	27.6	25.6	24.1	22.7	21.5	20.3	19.2	18.3	17.3
71	32.9	30.7	28.8	26.7	25.2	23.7	22.4	21.2	20.1	19.1	18.1
74	34.2	32.0	30.0	27.9	26.2	24.7	23.4	22.1	20.9	19.9	18.9
77	35.6	33.3	31.2	29.0	27.3	25.7	24.3	23.0	21.8	20.7	19.6
80	37.0	34.6	32.5	30.1	28.3	26.7	25.2	23.9	22.6	21.5	20.4
83	38.4	35.9	33.7	31.2	29.4	27.7	26.2	24.8	23.5	22.3	21.2
86	39.8	37.2	34.9	32.4	30.5	28.7	27.1	25.7	24.3	23.1	21.9
89	41.2	38.5	36.1	33.5	31.5	29.7	28.1	26.6	25.2	23.9	22.7
92	42.6	39.8	37.3	34.6	32.6	30.7	29.0	27.5	26.0	24.7	23.5
95	44.0	41.1	38.5	35.8	33.7	31.7	30.0	28.4	26.9	25.5	24.2
99	45.8	42.8	40.2	37.3	35.1	33.1	31.2	29.6	28.0	26.6	25.3
102	47.2	44.1	41.4	38.4	36.1	34.1	32.2	30.5	28.9	27.4	26.0
105	48.6	45.4	42.6	39.5	37.2	35.1	33.1	31.4	29.7	28.2	26.8
108	50.0	46.7	43.8	40.6	38.3	36.1	34.1	32.2	30.6	29.0	27.5
111	51.4	48.0	45.0	41.8	39.3	37.1	35.0	33.1	31.4	29.8	28.3
114	52.8	49.3	46.2	42.9	40.4	38.1	36.0	34.0	32.3	30.6	29.1
117	54.1	50.6	47.5	44.0	41.5	39.1	36.9	34.9	33.1	31.4	29.8
120	55.5	51.9	48.7	45.2	42.5	40.1	37.9	35.8	34.0	32.2	30.6
123	56.9	53.2	49.9	46.3	43.6	41.1	38.8	36.7	34.8	33.0	31.4
126	58.3	54.5	51.1	47.4	44.6	42.1	39.8	37.6	35.6	33.8	32.1
129	59.7	54.8	52.3	48.6	45.7	43.1	40.7	38.5	36.5	34.6	32.9
132	61.1	57.1	53.6	49.7	46.8	44.1	41.7	39.4	37.3	35.4	33.7
135	62.5	58.4	54.8	50.8	47.8	45.1	42.6	40.3	38.2	36.2	34.4
138	63.9	59.7	56.0	51.9	48.9	46.1	43.6	41.2	39.0	37.0	35.2
141	65.3	61.0	57.2	53.1	50.0	47.1	44.5	42.1	39.9	37.9	36.0
144	66.6	62.3	58.4	54.2	51.0	48.1	45.4	43.0	40.7	38.7	36.7
147	68.0	63.6	59.6	55.3	52.1	49.1	46.4	43.9	41.6	39.5	37.5
150	69.4	64.9	60.9	56.5	53.1	50.1	47.3	44.8	42.4	40.3	38.3
153	70.8	66.2	62.1	57.6	54.2	51.1	48.3	45.7	43.3	41.1	39.0
156	72.2	67.5	63.3	58.7	55.3	52.1	49.2	46.6	44.1	41.9	39.8
159	73.6	68.8	64.5	59.8	56.3	53.1	50.2	47.5	45.0	42.7	40.6
162	75.0	70.1	65.7	61.0	57.4	54.1	51.1	48.4	45.8	43.5	41.3
165	76.4	71.4	66.9	62.1	58.5	55.1	52.1	49.3	46.7	44.3	42.1
169	78.2	73.1	68.6	63.6	59.9	56.5	53.3	50.5	47.8	45.4	43.1
172	79.6	74.4	69.8	64.7	60.9	57.5	54.3	51.4	48.7	46.2	43.9
175	81.0	75.7	71.0	65.9	62.0	58.5	55.2	52.3	49.5	47.0	44.6

Classification	Overweight	Obesity I	Obesity II	Obesity III
BMI	= 25–29.9	= 30–34.9	= 35–39.9	≥ 40



WHAT IS OBESITY?

Obesity is a chronic illness in which a person accumulates excess fat, which can jeopardize health. Anyone with a BMI of 30 or more is classified as obese. Obesity is the result of an increase in the size or percentage of fat cells in the body. When a person gains weight, these fat cells first grow in size and then in number.

Obesity is more than a cosmetic issue.
Obesity is a disease and a serious health risk.¹

Many have the misconception that being fat is simply a lack of self-control. Similarly, being obese is often mistakenly considered the same as being overweight. In clinical terms, the difference is vital and often life threatening. Several medical organizations, including WHO (World Health Organization), classify obesity as a disease and a serious threat to health.²

Obesity is not simply a matter of not having self-control. It is a complex syndrome that involves appetite control and energy metabolism.

There has been an alarming rise in overweight and obesity around the world. In Europe, there are currently around 164 million obese people (BMI > 30) and approximately 12 million who are morbidly obese (BMI > 40)³. These numbers are expected to increase significantly.

CAUSES OF OBESITY INCLUDE:

Genetic factors

Obesity tends to be hereditary, which indicates a genetic cause. But, families also share dietary and lifestyle habits that could contribute to obesity. Separating these from genetic factors is not easy. Research shows that genetic factors are responsible for approximately 80% of a person's predisposition for developing obesity.⁴ They can directly lead to obesity in combination with several diseases. Unfortunately, we do not know how genes make us fat or thin. Some genes affect parts of the brain that control appetite and the feeling of being full. Others can determine how the body saves or burns calories.

Environmental factors

Environment has a huge impact on obesity. This includes lifestyle behaviors, such as what a person eats and level of physical activity. The increased prevalence of overweight and obesity is a reflection of several changes in factors such as eating habits and exercise over the past 20 to 30 years.⁵ Even though you cannot change your genetic disposition, you can change your eating habits and level of physical activity.

Psychological factors

Psychological factors also affect eating habits. Many eat as a reaction to negative emotions, such as pain, depression or anger. Obesity is also often considered the result of a lack of will power, weakness of eating too much and exercise too little. It is more accurate to consider obesity a chronic illness rather than a lifestyle choice.

Physical illnesses

Some illnesses can lead to obesity or weight gain. These include hypothyroidism, depression, several syndromes and some neurological conditions that can cause a person to eat too much. Medications, such as steroids and certain antidepressants, can cause weight gain. A doctor can let you know whether you have any underlying medical conditions that cause weight gain or make it hard to lose weight.⁶

WHAT IS MORBID OBESITY?

Morbid obesity is a chronic, life-long, genetically related illness. It is defined as a BMI of 40 or more. When obesity crosses over to morbid obesity, the excess weight jeopardizes the person's life. Morbid obesity is associated with many debilitating and life-threatening illnesses that affect health and quality of life while shortening average life expectancy.

When obesity crosses over to morbid obesity, the excess weight jeopardizes the person's life.

Since obesity is a chronic illness, its symptoms (called co-morbidities) develop gradually. In its early stages, obesity can make it hard to walk and cause back pain, fatigue, skin conditions and shortness of breath. If left untreated, obesity has a tendency to worsen. When obesity crosses the line into morbid obesity, it can lead to life-threatening illnesses, such as type-2 diabetes, high blood pressure, certain forms of cancer, high cholesterol and sleep apnea.⁷

Studies have shown that once morbid obesity has gained a foothold, efforts such as diet and exercise programs have little chance to generate significant, lasting weight loss.⁸

When morbid obesity has been diagnosed, the only way to treat current symptoms and prevent the debut of new symptoms is to achieve lasting weight loss.

The only way to prevent further development of symptoms is to achieve lasting weight loss. The fact is that as soon as you put on weight again, the co-morbidity comes back.



EFFECTS OF OBESITY AND MORBID OBESITY

1. Health risks

Obesity is more than a cosmetic issue. It is a serious health risk. Obesity is linked to a number of chronic and debilitating illnesses (called co-morbidities), such as type 2 diabetes, heart disease, high blood pressure, certain types of cancer, sleep apnea and back and joint pain.⁸ As BMI increases, so does the risk of developing co-morbidities. When obesity becomes morbid (BMI \geq 40), the medical problems can become life threatening.

Health risks from obesity:



Generated from information found in:
IASO – Diabetes and obesity: time to act

2. Mortality

The risk of premature mortality from a number of diseases increases as BMI increases.⁹ In addition, the risk of premature mortality increases the longer a person has been overweight.

In Europe, 320,000 people die each year from causes directly linked to obesity.³

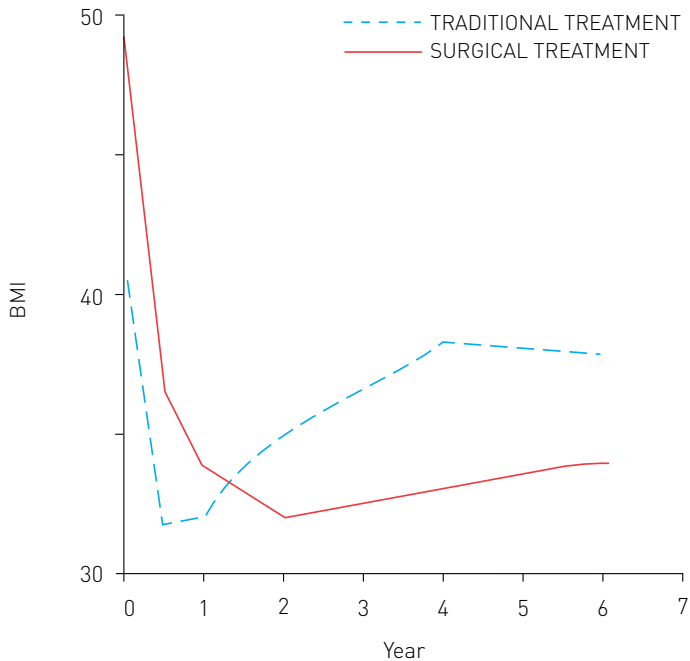
The increased rate of mortality is directly linked to weight gain. For people weighing 50% above the average weight, the risk of premature mortality is twice as great as those who are not overweight.⁸

3. Lower quality of life

Obesity is associated with lower quality of life. Obesity impairs physical, emotional and social functionality. Many overweight people often face judgement and discrimination. They become depressed and/or defensive and cannot live life to the fullest.¹⁰ Overweight people must adjust to daily problems, from finding clothes that fit and look good to finding a comfortable way to travel and live. In addition, daily activities become tiring and hard to perform. Overweight people also face a social stigma when seeking work or education. They are routinely considered less qualified for the job or as someone with a poorer work ethic, emotional problems or problems with interpersonal relationships.¹¹

FACTS ON OBESITY SURGERY

For the morbidly obese, obesity surgery is the only documented method that leads to lasting weight loss when all other forms of treatment have failed.



Weight loss curves for patients treated traditionally and surgically (generated from information found in Martin LF et al. Comparison of the costs associated with medical and surgical treatment of obesity. *Surgery* 1995; 118: 599-607).

Studies have shown that obesity surgery is the only way for morbidly obese patients to achieve lasting weight loss and prevent the debut of new, obesity-related illnesses.¹² A study of more than 22,000 patients showed that they lost an average of approximately 61.2% of their excess weight after obesity surgery.¹³ Non-surgical treatment, on the other hand, only works for 1 out of 20 who are morbidly obese. Less than 5% of those who participate in non-surgical weight loss programs have any significant weight loss and maintain it long term.⁸

Obesity surgery on the morbidly obese is associated with lasting weight loss and reduced risk of death.¹⁴

Even though obesity surgery is often considered risky, for many patients, the risk of remaining morbidly obese is much greater than the risk of surgery.

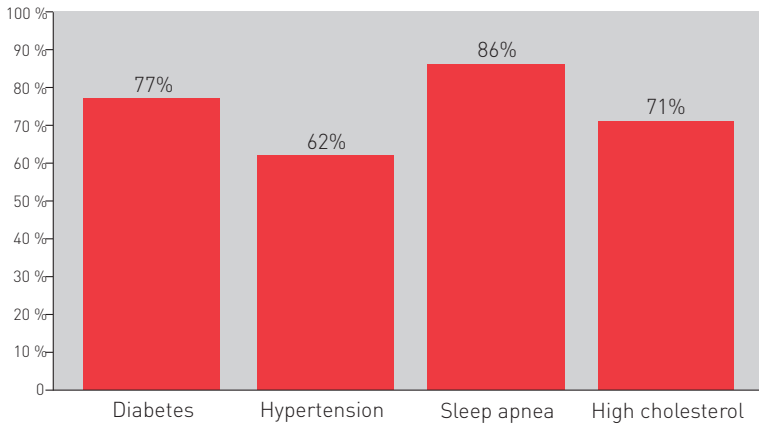
Obesity surgery significantly reduces the likelihood of death and prevents the development of new obesity-related health problems in morbidly obese patients. Scientific research shows that obesity surgery reduces the risk of death by 30%.¹⁴

Obesity surgery is a safe treatment.

The number of obesity operations has increased significantly in the past decade. Such procedures have become safer and more effective.¹⁵ At present, the likelihood of death from obesity surgery is comparable to the likelihood of death for one of the most common surgical procedures – removal of the gall bladder with keyhole surgery.^{13, 16}

Obesity surgery leads to the reduction or disappearance of obesity-related medical problems (co-morbidities).¹³

A study of more than 22,000 patients showed that obesity surgery leads to the disappearance or improvement of medical problems such as type-2 diabetes, high cholesterol, high blood pressure and obstructive sleep apnea.¹³



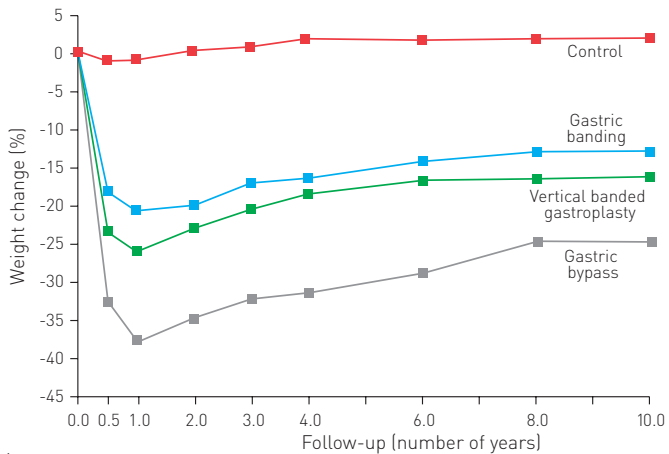
Percentage of those operated with co-morbidities that improve or disappear.

Obesity surgery makes it possible to lose weight and maintain the weight loss over time.

After obesity surgery, at least two-thirds of patients maintain at least 50% of their weight loss for 10 years or more.¹⁵

A study comparing the long-term effects of obesity surgery to non-surgical treatment showed:¹⁷

- After 2 years, total body weight decreased by 23% in the surgical group and increased by 0.1% in the non-surgical group.
- After 10 years, total body weight decreased by 16% in the surgical group and increased by 1.6% in the non-surgical group.



Number of participants

Control	627	585	594	587	577	563	542	535	627
Gastric banding	156	150	154	153	149	150	147	144	156
Vertical banded gastroplasty	451	438	438	438	429	417	412	401	451
Gastric bypass	34	34	34	34	33	32	32	29	34

Figure 1. Weight changes of SOS study participants over a 10-year period. All data is for participants who completed 10 years of the study. The average change in weight for the entire group of participants who received surgical treatment was practically identical to that of the subgroup of participants who underwent vertical banded gastroplasty.

The SOS study showed that post-surgery weight reduction is lasting over a 10–15 year period. Weight loss surgery has also led to reduced mortality.¹⁴

AM I A CANDIDATE FOR OBESITY SURGERY?

Only a surgeon specialized in obesity surgery can determine whether you are a viable candidate. The general requirements are:¹⁸

- You have a BMI of 40 or more.
- You have a BMI of 35 or more coupled with several obesity-related health problems (e.g. type 2 diabetes, heart problems, joint problems or sleep apnea).
- You have previously tried to lose weight under medical supervision – e.g. with diet, exercise and medication – but were unable to maintain the weight loss.
- You have no underlying illness causing your overweight.
- You are willing to make a life-long commitment to follow-ups and to following the extensive dietary, exercise and medical guidelines.
- There are no medical or psychological obstacles to surgery.
- No alcohol or drug abuse.

HOW MUCH WEIGHT CAN I EXPECT TO LOSE?

There are several factors that contribute to the amount of weight you lose after surgery. These include:

- Your age
- Your weight prior to surgery
- Your general state of health
- The type of surgery you have
- Your ability to exercise
- Your commitment to following the dietary guidelines and other follow-ups
- Your own motivation and support from your family and friends

A study determined that obesity surgery is considered successful when it leads to a maintained 50% weight loss without significant side effects.¹⁹ Patients lose an average of 61.2% of their excess weight after surgery.¹³ How quickly you achieve this depends on the factors indicated above. These will be clarified during discussions with your surgeon.

After obesity surgery, patients can maintain 50 to 60% of their weight loss long term. A long-term study spanning 14 years indicated lasting weight control.²⁰

After surgery, most patients quickly drop in weight and continue to do so 18 to 24 months after surgery.⁸

Patients with a higher starting BMI tend to lose more weight. But patients with a lower starting BMI can lose a larger percentage of their excess weight and have an easier time reaching their ideal weight.

What is even more important is that you can regain good health after surgery. And live life to the fullest again. You will be able to move around more easily, breath more easily, sit comfortably and get off of many of the medications you may be taking today.

FACTS ON NON-SURGICAL TREATMENTS

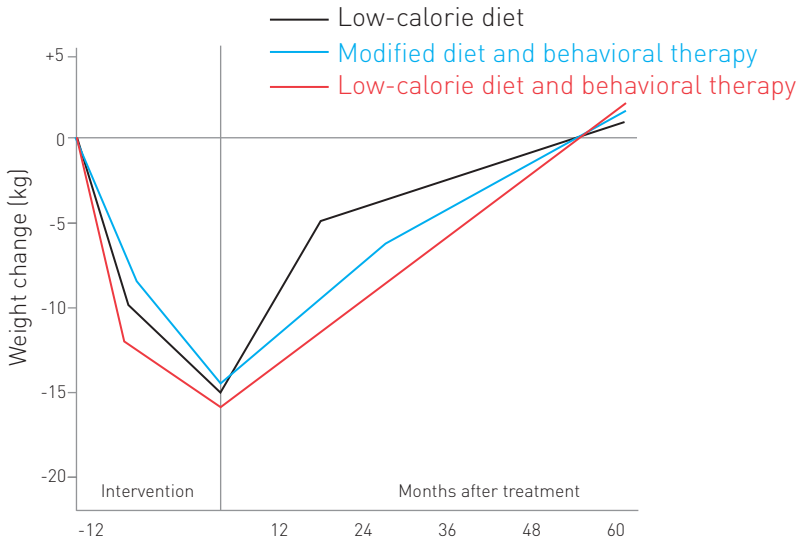
Non-surgical treatments are only successful for 1 out of 20 morbidly obese individuals.⁸

Most non-surgical weight loss programs are based on a combination of diet, medication, behavioral changes and regular exercise. Unfortunately, such programs only work for 1 out of 20 morbidly obese individuals. Less than 5% of those who participate in non-surgical weight loss programs show any significant, lasting weight loss.⁸ Most who participate in such programs regain the weight within a year⁵ and subject themselves to serious health risks from a continuous cycle of weight loss and weight gain.



DIET

Obesity treatments



Source: Wadden TA. Ann Intern Med 1993; 119:688-93

During the five years after treatment, the majority of patients who undergo dietary treatment gain more weight than they had lost.²¹

A weight loss of 5 to 10% has proven to be beneficial in reducing the severity of obesity-related medical problems.

EXERCISE

Among patients who have lost weight and not put it back on, exercise is the common denominator for maintaining their weight.

Diet must always be coupled with exercise to lead to weight loss. Although the weight loss generated by the two forms of treatment together is rather modest, exercise is a key to maintaining weight.

MEDICATION

Medication must be coupled with diet, changes in behavior and physical activity. Treatment with medication can be considered for:

- Patients with a BMI > 30 without co-morbidity
- Patients with a BMI > 27 with co-morbidity.²²

Medication generates a 6 to 10% weight loss after one year, with a large weight gain when the treatment is ended.²³

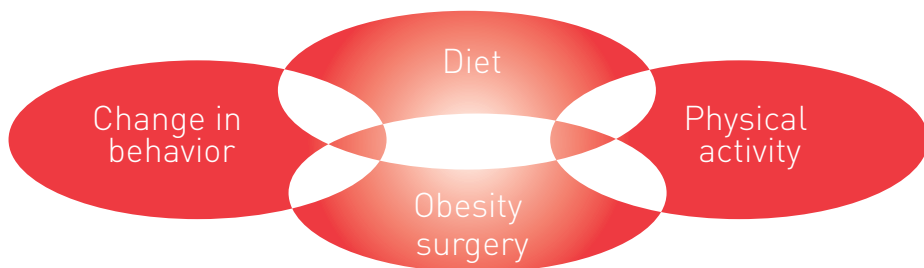
Drug treatment of obesity leads in an average weight loss of 6–10% of the original body weight after 1 year, with a large weight gain when treatment is ended.²³

THE MULTIDISCIPLINARY APPROACH TO LOSING WEIGHT

Both at private and at public clinics, obesity surgery is performed by a surgeon specialized in obesity surgery.

Because morbid obesity is a complex syndrome, it must be treated from several perspectives. Most obesity surgery units use a multidisciplinary approach. A team consisting of several types of professionals who are specialized in obesity and sensitive to the specific needs of morbidly obese patients, such as:

- Evaluate the patient prior to surgery, assessing both surgical alternatives and alternative treatments
- Provide training and treatment after surgery
- Dietary and psychological counseling
- Postoperative physical fitness program
- Long-term follow-up and support required to maintain weight loss



EXAMPLE OF A MULTIDISCIPLINARY TEAM:

Doctors: internal medicine specialist, endocrinologist/diabetologist, primary care physician, gastroenterologist or cardiologist

- Coordination of patient care
- Check and treatment of obesity-related medical problems
- Thorough physical and illness-specific testing

Dietician:

- Preoperative assessment of diet
- Preoperative treatment with low-calorie powders to reduce the amount of fat in the liver²⁴
- Preoperative education on postoperative dietary and nutritional treatment (consistency, food product selection, portion size, meals, protein supplements, dietary supplements) as well as behavioral changes (chew well, eat slowly, do not eat and drink at the same time)
- Follow-up of dietary and nutritional treatment and behavioral changes during the postoperative period

Psychologist or counselor:

- Preoperative psychological evaluation with assessment of realistic expectations and insight into the life-long changes required in behavior
- Early and continual postoperative follow-up:
- Support and encouragement
- Assessment of emotional status
- Lifestyle changes
- Discussing reaction to the operation

Surgeon:

- Preoperative assessment of the patient's motivation and expectations
- Discussion of the benefits and risks of the different types of obesity surgery
- Choice of the operation best suited to the individual patient
- Postoperative follow-up of the procedure performed

- An anesthesiologist with extensive experience and interest in obesity surgery
- Preoperative preparations:
 - thorough medical evaluation
 - achieve optimal control of all obesity-related illnesses
- Day of the operation:
 - interview and examination of the patient
 - all obesity operations are performed under anesthesia

Your motivation is the key to your success.

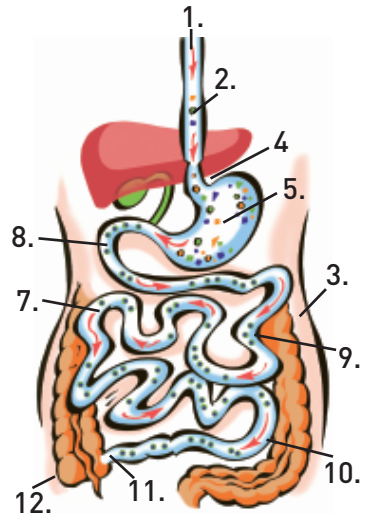
Obesity surgery can only be successful if you commit to it for the rest of your life and are willing to change your behavior. The operation is only a tool – not a magic cure-all. The end result depends on how strictly you follow the recommended guidelines for diet, exercise and lifestyle changes. You should consider the operation the start of a whole new phase of your life.



HOW THE DIGESTIVE TRACT WORKS

It is important that you understand how the digestive tract works for a better understanding of obesity surgery. When the food you eat travels through the digestive tract, digestive juices and enzymes are introduced at specific stages, enabling the absorption of nutrients. Food that is not absorbed is then prepared for expulsion from the digestive tract.

1. In the mouth, the food is mixed with saliva and is broken down into smaller pieces through chewing.
2. The food travels from the mouth to the stomach through a large, muscular tube (esophagus or gullet).
3. The abdomen houses all digestive organs.
4. The food passes to the stomach through a valve that prevents the food from going back up into the esophagus after it has mixed with acid, which would cause damage and pain.
5. The stomach is a pouch that sits high up in the abdomen and serves to store and digest food. In the stomach, the food is mixed with acid produced by the body to facilitate the breakdown of proteins, fats and complex carbohydrates into small, more easily absorbed units. The stomach can normally hold up to 1.5 liters of food and/or liquid.
6. Once the food has been digested to a specific degree, it is emptied into the first part of the small intestine through a small round muscle called the pylorus. Digestive juices in the form of pancreatic juices and bile are mixed with the contents of the small intestine to break down the food further.
7. In the small intestine, most of the nutrients are absorbed. The small intestine has three components – duodenum, jejunum and ileum – and is 4.5 to 6 meters long.
8. The duodenum is the first part of the small intestine. Here, food is mixed with bile produced by the liver and digestive juices from the pancreas. A lot of iron and calcium is absorbed here.
9. The jejunum is the middle section of the small intestine. It is responsible for digestion.
10. The last section of the small intestine is the ileum. It is here that the fat-soluble vitamins A, D, E and K as well as vitamin B12 are absorbed.
11. The ileocecal valve separates the small intestine from the large intestine (colon) to prevent the bacteria-rich content of the colon from running back into the small intestine.
12. Undigested material passes to the colon, where it is temporarily stored and concentrated through the reabsorption of salts and water. Finally, the feces are expelled.



FEELING FULL

The food we eat contains nutrients that the body uses as fuel. The brain plays several roles in relation to food so that what we eat suits our energy needs. One of them is the feeling of being full after a meal. Fullness is a stomach-to-brain reflex actuated by receptors in the upper part of the stomach. We must therefore fill the stomach almost completely in order to feel like we have eaten enough. Once we have eaten enough food to expand the stomach, the receptors send a full signal to the brain's fullness center – the hypothalamus, which regulates the degree and frequency of feelings of hunger.

In some people, the roles the brain uses for food intake are poorly regulated. If you repeatedly eat too much, the smooth muscle fibers of the stomach could lose their elasticity. It then takes more and more food to generate the same receptor response. This explains why extremely obese people do not feel satisfied with the food they eat and can consume extreme amounts of food in a single meal.

There are also other factors that can play a role.



HOW OBESITY SURGERY CAN REDUCE EXCESS WEIGHT

CHANGE YOUR ENERGY BALANCE – THE KEY TO WEIGHT LOSS

Energy balance is the relation between how much food is absorbed and how much energy the body consumes.

$$\text{ENERGY BALANCE} = \frac{\text{ENERGY INTAKE}}{\text{ENERGY OUTPUT}}$$

Excess energy is stored in the body as fat and is kept in reserve until it is burned as energy. When the energy burned during physical activity is greater than the energy in the food you eat, the fat reserves are used and excess fat is burned to meet the body's needs.

Reducing food intake or increasing physical activity leads to weight loss.

OBESITY SURGERY CAN REDUCE EXCESS WEIGHT BY:

- Reducing food intake >> restrictive procedures
- Reducing food intake and causing you to absorb less of the food you eat >> restrictive and malabsorptive procedures
- Reducing food intake to a certain degree and causing you to absorb only some of the food and nutrients you eat >> malabsorptive procedures

RESTRICTIVE AND MALABSORPTIVE PROCEDURES

Gastric bypass

HOW IT WORKS

Gastric bypass is a combination of restriction and malabsorption.

This procedure:

- reduces the amount of food you can eat at one meal (restriction)
- causes you to absorb slightly less of the food and nutrients you eat (malabsorption)
- causes you to be intolerant to food products that you should be avoiding anyway (i.e. concentrated sugar and fat)

With gastric bypass, the surgeon creates a small stomach pouch (approx. 30 ml). The small pouch is connected right to the middle portion of the small intestine (jejunum). When you eat, the food quickly accumulates in the pouch. Since only a small amount of food is required to fill the pouch, the upper part of the stomach signals the brain early that it is full – as if the entire stomach were full. This is one of the reasons you feel full more quickly and eat less.

Your appetite also decreases since, in contrast to the normal process, the contents of the stomach pouch empty directly into the small intestine.

Since the food bypasses the first part of the small intestine (duodenum), the body absorbs fewer nutrients and calories. Because the stage at which the food is mixed with gastric juices, bile and pancreatic juices is delayed, the food is digested at a later stage than during the normal digestion process. Your surgeon may decide to change the length of the intestinal segment to generate more or less malabsorption.

Advantages:

- Greater total weight loss compared to restrictive procedures.

Disadvantages:

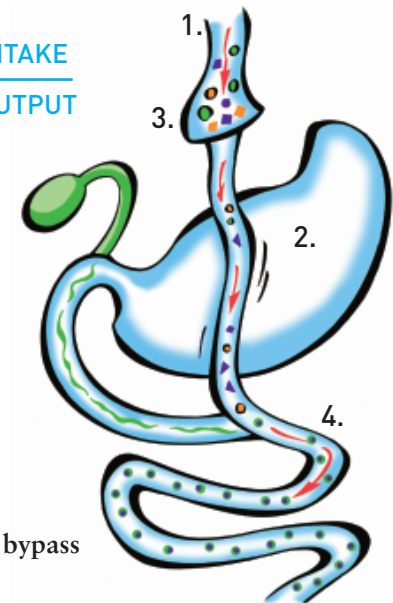
- Since a gastric bypass changes the body's anatomy and the digestive process, there is a greater risk of complications and side effects.⁸
- Since there is malabsorption of nutrients, mineral and vitamin deficiency is a possibility.

Results:

- By one year after surgery, patients have lost approximately 77% of their excess weight.²⁶
- Scientific research shows that patients retain their weight loss 10 to 14 years after surgery.²⁰
- The majority of medical problems associated with obesity (type-2 diabetes, high blood pressure, sleep apnea, depression and backaches) either improve or disappear after surgery.¹³
- In most cases, patients report a clear feeling of fullness combined with a feeling of satisfaction that reduces the desire to eat.

$$\text{ENERGY BALANCE} = \frac{\text{ENERGY INTAKE}}{\text{ENERGY OUTPUT}}$$

1. Oesophagus
2. Stomach
3. Stomach pouch
4. Jejunum



RESTRICTIVE PROCEDURES

Sleeve Gastrectomy

HOW IT WORKS

Restrictive obesity surgery reduces the amount of food you can eat at one meal. The procedure makes you feel full sooner and longer. As a result, you eat less and lose weight.

In a sleeve gastrectomy, most of the stomach is removed, leaving a residual sleeve-shaped stomach. This means that you can only eat a small amount at a time and you feel full more rapidly. At the same time, the sleeve gastrectomy procedure removes that part of the stomach which produces the hormone responsible for the feeling of hunger (ghrelin). This means that, at least initially, you feel less hungry and cravings are less frequent.

Your sleeve stomach has a smaller capacity so that you can consume less food per meal. This means that you take in less energy (calories) than before. The energy balance becomes negative, you are consuming less calories than you need, so you lose weight.

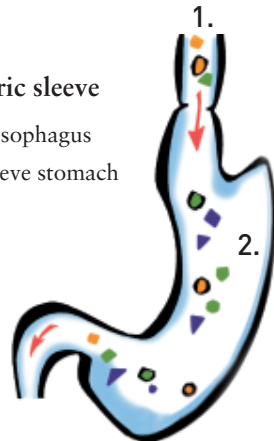
The sleeve gastrectomy is part of a comprehensive therapy to lose excess weight. Besides a change of eating and drinking habits however, this also includes daily exercise, e.g. walking or climbing steps, and individual endurance sports such as Nordic walking, aqua fitness or cycling.

The sleeve gastrectomy procedure is only an aid to weight reduction. The following three steps form the basis:

1. Changing your eating habits
2. Increasing your physical activity
3. Monitoring your health

Gastric sleeve

1. Oesophagus
2. Sleeve stomach



Advantages:

- Significant reduction in the size of the stomach, but the normal method of nutrition is retained.
- When the stomach is surgically reduced in size, a part of the stomach where Ghrelin ("Hunger Hormone") is produced, is removed, therefore less feeling of hunger, less cravings.
- No dumping syndrome (see explanation of terms), since the muscle at stomach exit remains intact.
- Intestine remains completely intact, in rare cases signs of deficiency (vitamins/ minerals).
- Gastroscopy still possible without any difficulties.

Disadvantages:

- The effect of the stomach reduction does not work with high-caloric liquid nutrients or fluids.
- Non-reversible operation - part of the stomach is removed.
- Complications such as leakage or fistulae are possible due to the seam on the sleeve stomach.

Results:

- Patients have achieved excess weight loss of 50-80% two to three years after surgery
- Reduced risk of dumping syndrome

Gastric banding

With this procedure, the surgeon implants a soft, low-pressure band around the upper part of the stomach, giving it an hourglass shape. A small passage between the small, upper pouch (approx. 30 ml) and the rest of the stomach allows food and fluid to pass through. When you eat, the food quickly accumulates in the small, upper pouch and slowly passes down to the lower part of the stomach. It only takes a little bit of food to fill the little stomach pouch. The upper part of the stomach sends a signal to the brain as if the entire stomach were full. This causes you to feel full more quickly and for a longer period of time while at the same time eating less.

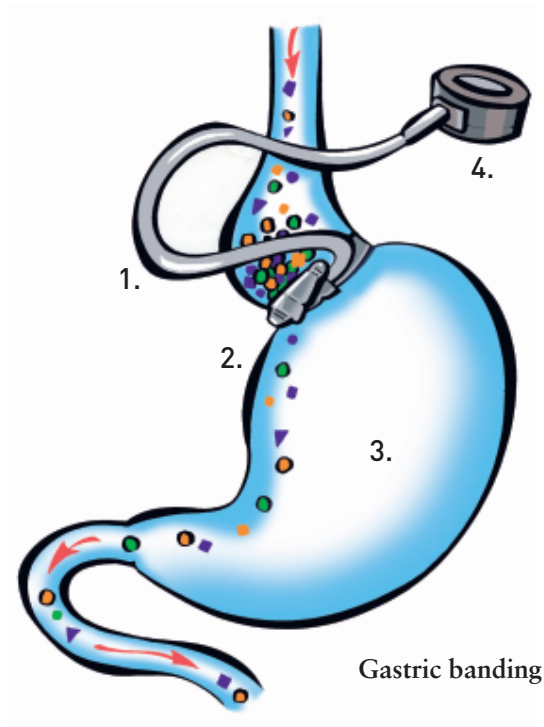


Your anatomy is not changed by this operation; it is completely reversible. The band can be removed. In addition, the digestion and absorption processes in the digestive tract remains unchanged.

The cooperation of the patient is vital to the success of restrictive procedures. After the procedure, you must follow the specific dietary guidelines and behavioral changes laid out by your multidisciplinary team and adapt to your new eating habits. If you do not follow their guidelines, you could stretch the stomach pouch and/or the narrow opening between the two parts of the stomach, hindering the goal of the operation.

$$\text{ENERGY BALANCE} = \frac{\text{ENERGY INTAKE}}{\text{ENERGY OUTPUT}}$$

1. Small stomach pouch
2. Gastric Band, e.g. Swedish Adjustable Gastric Band (SAGB)
3. Larger portion of stomach
4. Entry port



The band is adjustable (SAGB as an example)

The inner part of the band is inflatable and contains a fluid (saline). There is a direct correlation between how narrow or wide the opening between the two parts of the stomach is and how much weight you lose. The size of the passage depends on how much fluid is in your band. The inflatable balloon is filled via a small entry port implanted under the skin during surgery and is connected to the band via a tube.

The band is empty when positioned around the stomach. The first adjustment with fluid is made after approximately four weeks. This is part of the follow-up care and is handled on an outpatient basis. It requires no pain relievers or anesthetic. It is normally performed at the surgeon's or doctor's office or at the radiology department if the physician wants to use a special X-ray examination to see how the fluid reaches the band. You will be asked to swallow a substance (barium) that shows whether the food can pass through the passage in a satisfactory manner. The physician and his or her team will indicate when the band must be adjusted based on how well you are losing weight.

Surgery may be required to change or reposition the gastric band and/or the injection port. Neither the band nor the injection port is designed to be implanted your entire life.



Example:
Swedish Adjustable
Gastric Band (SAGB)
with Velocity Injection Port

Advantages:

- Because the band does not change the body's anatomy, there is a significant advantage:
- The band can be removed and the original shape and structure of the stomach restored.
- Because the procedure is normally minimally invasive (keyhole operation), the patient recovers from surgery quickly and only a short hospital stay is required (normally 48 hours).
- The volume of the band is adjustable, which means that the rate at which the stomach pouch empties can be increased or decreased to suit the situation and needs of the patient.

Disadvantages:

- The operation could come to nothing if the patient continually eats or drinks things high in calories or fat.
- Weight loss is less and slower than with other procedures. But, other types of obesity surgery can be associated with higher risks and more complications.
- There could be postoperative complications from stomach expansion or movement.

Results:

- With gastric banding, patients lose an average of 50–60% of their excess weight. Patients lose around 30% of their excess weight during the first 12 to 18 months after surgery. European studies have shown that patients lost 49, 55 and 57% of their weight three, four and five years, respectively, after surgery.²⁵
- After obesity surgery, patients can maintain a large percentage of their weight loss over 10 years.¹⁷
- The majority of medical problems associated with obesity (type-2 diabetes, high blood pressure, sleep apnea, depression and backaches) either improve or disappear after surgery.¹³

MALABSORPTIVE PROCEDURES

Entail a reduction in the size of the stomach and a marked change in the digestive process so that you:

- reduce the amount of food you can eat at one meal
- absorb significantly less of the food you eat.

The size of the stomach is also reduced with malabsorptive procedures, but the stomach pouch created is much larger than for other procedures. The anatomy of the small intestine is changed so that digestion is delayed (bile and pancreatic juices are redirected so that they are mixed with the ingested food closer to the middle and end of the small intestine). Absorption of nutrients and calories are thereby reduced to a greater degree than with a gastric bypass. Not only do you eat less, you also absorb fewer calories.

Each of the malabsorptive procedures differs when it comes to how and when the digestive juices come into contact with the food.



Biliopancreatic diversion (BPD)

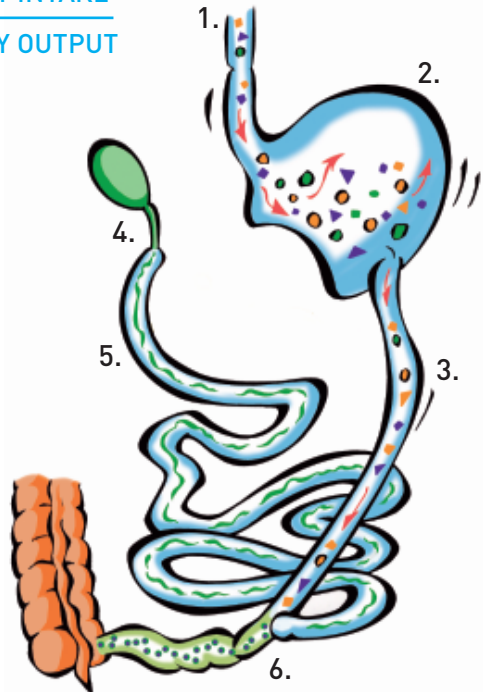
How it works:

BPD makes the stomach smaller to both restrict food intake and reduce acid production. The small intestine is separated with one end attached to the stomach pouch in order to create a so-called “nutrient branch”. All food passes through here, but not much is absorbed. The bile and pancreatic juices required for digestion go through the “biliopancreatic branch”, which is connected to the part of the intestine closest to the end. This supplies the part of the small intestine now called the “common branch” with digestive juices. Since the food is only mixed with the biliopancreatic juices necessary for digestion at a later stage, fats and carbohydrates are permanently malabsorbed. The surgeon can vary the length of the “common branch” in order to regulate the amount of protein, fat and fat-soluble vitamins absorbed.

$$\text{ENERGY BALANCE} = \frac{\text{ENERGY INTAKE}}{\text{ENERGY OUTPUT}}$$

1. Oesophagus
2. Stomach pouch
3. Nutrient branch
4. Bile duct
5. Biliopancreatic branch
6. Common branch

Biliopancreatic diversion



Biliopancreatic diversion with duodenal switch

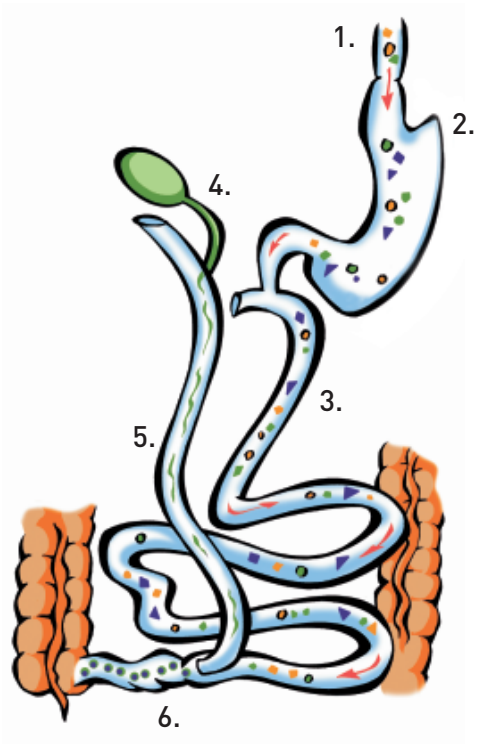
How it works:

This procedure is a variant of the BPD in which part of the stomach remains, with pylorus and the start of the duodenum at its end. The first part of the small intestine (duodenum) is separated so that pancreatic juices and bile pass by. The closest end of the “nutrient branch” is then fastened to the beginning of the duodenum while the “common branch” is created in the same manner as with a BPD.

$$\text{ENERGY BALANCE} = \frac{\text{ENERGY INTAKE}}{\text{ENERGY OUTPUT}}$$

1. Oesophagus
2. Stomach pouch
3. Nutrient branch
4. Bile duct
5. Biliopancreatic branch
6. Common branch

Biliopancreatic diversion
with duodenal switch



Advantages:

- Malabsorptive procedures produce greater weight loss compared to purely restrictive procedures. But, the more the digestive system is tampered with, the greater the risk of complications and side effects.⁸
- Patients can eat larger meals than with other procedures.

Disadvantages:

- Extremely high risk of nutrient and vitamin deficiencies.
- Life-long vitamin supplementation is required. If the dietary and vitamin supplement guidelines are not followed rigorously, at least 25% of the patients will develop digestion problems or nutrient deficiencies that require treatment.
- Thorough, life-long checks for protein deficiency, anemia and osteoporosis.

Results:

- Studied patients achieved a 74% excess weight loss after one year, 78% after two years, 81% after three years, 84% after four years and 91% after five years.²⁷
- Scientific research shows that patients can maintain a large percentage of their weight loss over 5 years.²⁷
- The majority of medical problems associated with obesity (type-2 diabetes, high blood pressure, sleep apnea, depression and backaches) either improve or disappear after surgery.¹³



POSSIBLE COMPLICATIONS AND SIDE EFFECTS

	Gastric bypass	Sleeve Gastrectomy	Adjustable gastric banding
Nausea and vomiting	●	●	●
Constipation	●	●	●
Dilation of pouch		●	●
Band slips			●
Obstruction of exit			●
Erosion of the band			●
Leakage at the band			●
Infection or dislocation of port			●
Mineral and vitamin deficiencies	●	●	
Diarrhea		●	
Swollen abdomen and smelly stool or gas			
Increased risk of gallstones	●	●	●
Gastric ulcer	●	●	
Pulmonary embolism or respiratory failure	●	●	●
Anastomosis leakage	●	●	
Ileus	●	●	

Biliopancreatic diversion	Description
●	Eating too quickly or too much or not chewing enough can cause vomiting.
●	Constipation is common due to the low energy (and thereby fiber) intake. Bowel-regulating agents based on grain, seed or bulk should be avoided. Bowel-regulating agents in the form of liquid bulk can be used.
	The stomach pouch could stretch.
	The band could slip from its intended position.
	The passageway for food and liquid can become too small if the band slips out of place or food gets stuck.
	The band can erode the stomach wall.
	There could be problems around the injection port and tube.
●	
●	Right after surgery, there is a period of intestine adaptation with recurring diarrhea. This will become less severe over time, but could be a permanent and life-long condition that affects your quality of life.
●	
●	Rapid weight loss can lead to an increased risk of gallstones and make it necessary to remove the gall bladder.
●	Rerouting of bile, pancreatic juices and other digestive juices outside of the stomach could lead to intestinal irritation and ulcers.
●	
●	Anastomosis leakage can occur due to separation and rejoining of the intestine.
●	The intestine may be pinched or nicked, resulting in passage obstruction.

Risks related to obesity surgery

As with all other surgical procedures, obesity surgery entails risks. Patients should speak with their surgeon to discuss which type of procedure is best for them. Appendix A (see page 47) indicates some of the possible risks and complications associated with obesity surgery. It is important that you discuss with your surgeon the risks specific to a person with your medical history who undergoes your specific procedure.

YOUR NEW LIFESTYLE AFTER SURGERY

Diet

Although the postoperative dietary guidelines differ between the different surgeries and types of procedures, you must eat differently, have a healthier lifestyle and commit to following documented guidelines for long-term success. While it may be a challenge at first, it will help you gain maximum benefit from your operation. What is most important is that you follow the strict guidelines provided by your dietician, surgeon or nurse.

After the procedure, you will most likely start with a liquid diet, followed by food with a mashed/purée consistency. You will then slowly resume eating a more normal diet with healthy, lean food that is low in calories. Following the dietary guidelines does not mean that you can no longer enjoy life.

You will still be able to go out and eat with family and friends. You will just need to learn new eating habits that will help prevent you from eating too much and experiencing uncomfortable side effects. Take your time and focus on the conversation. Consider the occasion an opportunity to relax instead of focusing on the food.

Exercise

After the surgery, it is not enough to simply change your eating habits. You must also change your level of physical activity. In general, patients should start exercising at a slow pace. Consult your surgeon before increasing your physical activity. He or she will provide an individual exercise program tailored to your needs. The physical activities will become easier as you lose weight.

Contraceptives and pregnancy

Adjustable gastric banding and sleeve gastrectomy

Pregnancy entails no increased risk compared to non-obese women. It is not advisable to get pregnant immediately after an adjustable gastric banding procedure or sleeve gastrectomy since the fetus needs a good supply of nutrients. Should the patient become pregnant, all fluid should be removed from the band. Follow-ups and checks are a necessity.

Gastric bypass and malabsorptive procedures

Because gastric bypass and malabsorptive procedures change the absorption of several nutrients and induce rapid weight loss, pregnancy should be avoided at least 12 to 18 months after the procedure. The use of birth control pills should be coupled with other contraceptive methods.

Two studies of 111 pregnancies after gastric bypass showed minimal side effects with thorough medical checks and suitable vitamin and nutrient supplements.¹⁵ A folic acid supplement should also be discussed.

Support groups

Support groups can be an excellent forum for patients who have undergone obesity surgery to discuss various personal and professional issues. Your surgeon can provide information on support groups that can help with short and long-term questions and needs.

Regular check-ups and long-term follow-up

It is vital that you get checked regularly after surgery. This is done on an out-patient basis. Your surgeon and his or her team will discuss this with you and you will be given an individual check-up schedule. The check-ups will be relatively frequent at first, but will decrease in frequency over time. Once your weight has stabilized, you will normally only come in for an exam once a year.

Adjustable gastric banding

During the first 18 months after surgery, your band may be gradually filled with fluid. More frequent check-ups may be required during this period. Once your weight has stabilized, you will normally only come in for an exam once a year.

Gastric bypass and malabsorptive procedures

The first check-up will be after a few weeks. Over time, the intervals between check-ups will be longer. Once your weight has stabilized, you will normally only come in for an exam once a year.

PRACTICAL INFORMATION

LAPAROSCOPIC SURGERY (KEYHOLE SURGERY) COMPARED TO OPEN SURGERY

Laparoscopic obesity surgery is a minimally invasive procedure. A few small incisions are made in the abdominal wall in order to insert small “tubes,” so-called trocars, for the passage of the surgical instruments required for the operation. The position, number and size of these incisions may vary from surgeon to surgeon. A small camera is then inserted into the abdomen. The surgeon uses this to see inside the abdomen via a separate monitor. This provides better visualization and better access to important anatomical structures.

Laparoscopy is less invasive than open surgery.

The advantages of laparoscopy compared to open surgery:⁸

- Less postoperative pain
- Better cosmetic results
- Fewer wound infections
- Fewer incisional hernias
- Quicker recovery and return to preoperative activity levels

HOSPITAL STAY

For most patients, the hospital stay is 3–4 days after open surgery and 1–3 days after laparoscopy (approximately 2 days after adjustable gastric banding and approximately 3–5 days after other procedures), but the actual length of your stay is determined by your surgeon.

You are discharged when:

- You can swallow enough nutrient-rich liquids to prevent dehydration
- You no longer have any fever
- You have adequate pain control with medication anesthesia.
- No alcohol or drug abuse.
- Stop smoking at least 6 weeks prior to surgery.

To prevent blood clots, anti-embolism stockings or other compression aids are worn on the legs. Your surgeon may ask that you try to stand up and move around as soon as possible. Normally within the first 24 hours.

Depending on your medical state, you may be admitted to the intensive ward for strict observation of your heart and lung functions. The hospital may decide that patients who use CPAP (Continuous Positive Airway Pressure) or BiPAP (Bilevel Positive Airway Pressure) machines for sleep apnea bring along their machines for use immediately after surgery.

BEFORE AND AFTER SURGERY

Before surgery

- You will likely be treated with low-calorie powder 2–4 weeks prior to surgery. This is intended to reduce the size of the liver to give the surgeon easier access during the operation.
- Women may be required to stop taking estrogen (birth control pills or hormone replacement) one month prior to surgery to reduce operation risks.
- The night before surgery, the doctor will ask you not to ingest anything by mouth starting at midnight so that your stomach is empty for the operation.
- Tell your surgeon or any member of his or her team if you take any medications daily. Also tell your doctor if you take acetylsalicylic acid, medication that slows blood coagulation or anti-inflammatory medication (for arthritis, arthrosis, etc.). This is important because he or she will have to decide exactly when you must (temporarily) stop taking such medications prior to surgery.
- The operation is performed under anesthesia, which is administered by a certified anesthesiologist with extensive experience in the treatment of morbidly obese patients

After surgery

- After laparoscopy, you may feel a little soreness in your shoulders. This is because your abdomen was inflated with carbon dioxide to create a work space. It is seldom possible to eliminate all carbon dioxide at the end of the operation, but what remains is quickly absorbed and will not hurt your body. The pain in your shoulders is temporary and will disappear quickly, i.e. within a few days.
- Patients normally report limited pain after surgery, but some patients require pain killers. No other medications are required after surgery. You are encouraged to gradually resume your normal activities after being discharged from the hospital. Your doctor and his or her team will let you know when you can resume your normal activities and what types of activities you should avoid.
- As previously mentioned, you must adhere to a strict diet after your operation.
- See the brochure “Your future – now” in the same series (“Your new life starts today!”) and be sure to follow the advice of your multidisciplinary team. The operation requires great discipline on your part since you will be forced to change your eating habits.
- Your ability to resume the same activity level as before surgery depends on your physical condition, the nature of the activity and the type of obesity surgery that was performed. Many patients resume their normal activities within six weeks of surgery. Patients who have undergone the minimally invasive laparoscopy can resume activities within a few weeks.

THE FIRST STEP OF AN IMPORTANT JOURNEY

In order to understand the risks and advantages of the different types of obesity surgery, it could be helpful to talk to people who have already taken this step to help you make a decision you can live with the rest of your life. The best source of information is an experienced surgeon and his or her team. They know how to handle your specific needs before, during and after surgery.

For additional information, please visit:

www.bospa.org (British Obesity Surgery Patient Association)



QUESTIONS TO ASK YOUR SURGEON

Here are some questions you should ask before making your decision about surgery:

- What types of bariatric surgery have you performed?
- How many of each procedure have you performed?
- Can the procedure be done with a minimally invasive technique?
- Am I a candidate for surgery even though I have one or more health problems related to my obesity?
- Which procedure is best for me? Why? What are the risks?
- How long does the operation last?
- How long should I expect to stay at the hospital?
- How long will it take before I can resume the activity level I had prior to surgery?
- How will my food habits be changed?
- What is the normal weight loss and improvement of associated health conditions for your other patients?
- Do you have any patients willing to share their experiences – both positive and negative?
- What kind of information can you provide to help my family and friends get a better understanding of this operation?
- What type of long-term aftercare can you provide?
- What do you expect of me if I choose to undergo surgery?

THE IMPORTANCE OF SUPPORT

The changes to your diet and lifestyle after obesity surgery could last your whole life. You have a greater chance of life-long success if you surround yourself with people who understand and support your goals. Things you can do:

- Help your friends and family understand why you have chosen a surgical weight loss solution. Many people think that obesity surgery is an experimental obesity treatment rather than an alternative that has been around for more than 40 years. It is important that they understand that morbid obesity is an illness and that dieting does not work for you.
- People who are morbidly obese often report that their spouse or others close to them do not seem to encourage their weight loss. These people consider your weight a part of your identity. You must understand that this is a fear of change. Discuss your reasons for undergoing obesity surgery. They need to know that your health is at stake and that you are counting on their help during and after the surgery.
- Join support groups near you or visit them online. You can get help with this through the surgical ward. Surround yourself with people in the same situation. Ask questions and get answers in a supportive environment. Build a network to share experiences. It is important to know that you are not alone. There are knowledgeable, friendly people who can support and help you.

APPENDIX A – RISKS AND COMPLICATIONS OF OBESITY SURGERY

As with all surgery, there are surgical complications, long-term complications and risks associated with obesity surgery. You should discuss these with your doctor. Reported risks include, but are not limited to:

POSSIBLE SEVERE COMPLICATIONS:

Surgical

Perforation of the abdomen/intestines or leakage leading to peritonitis (inflammation of the peritoneum) or abscess. Internal hemorrhaging that requires a transfusion. Severe wound infection - opening of the wound - incisional hernia. Damage to the spleen that requires removal or other organ damage. Obstruction of stomach or intestine evacuation (ileus).

Lungs

Pneumonia – atelectasis (collapse of a lung) – fluid in the chest. Respiratory insufficiency (breathing difficulties) – pulmonary edema (fluid in the lungs). Thrombosis (blood clot) in the legs – embolism (blood clot) in the lungs.

Cardiovascular

Myocardial infarction (heart attack) – chronic cardiac insufficiency. Arrhythmia (irregular heart beat). Stroke (Cerebrovascular Accident, CVA).

Kidneys and liver

Acute kidney failure. Liver failure – hepatitis (can develop to cirrhosis).

Psychosocial

Anorexia nervosa – bulimia, postoperative depression – dysfunctional social problems. Psychosis.

Death

Other complications (could become serious)

- Minor wound or skin infection/scarring, deformity, hanging skin. Urinary tract infection. Allergic reactions to medication. Vomiting or nausea/inability to eat certain foods/improper eating habits. Inflammation in the esophagus (esophagitis) – acid reflux (heartburn). Low levels of sodium, potassium or blood sugar – low blood pressure. Problems emptying the stomach (narrow or stretched). Anemia – metabolic deficiency (iron, vitamins, minerals) – temporary hair loss. Constipation – diarrhea – bloating – cramps – smelly stool or gas. Gall stones or gall bladder disease.
- Stomach or drainage wound (peptic ulcer). Disturbance of staples – weight gain – failure to achieve satisfactory weight loss. Penetration of foreign material (e.g. band) into the stomach. Intolerance to refined sugars (dumping), accompanied by nausea, sweating and weakness.
- Reduced bone density.

APPENDIX B – GLOSSARY

Absorption	The process during which digested food is absorbed in the lower part of the small intestine and passes out into the bloodstream.
Adipose	Containing fat; related to fat
Anastomosis	Surgical connection between two structures.
Anastomosis with	Upper connection between stomach and small intestine with a gastrojejunostomy gastric bypass.
Bariatric surgery	Another name for obesity surgery.
BMI (Body Mass Index)	Method of calculating the degree of overweight based on body weight and body surface area.
Hernia	Weakness in the abdominal wall that causes a visible bulge.
Colon	Large intestine – starts at the end of the small intestine and ends at the rectum.
Dilation	Widening of a passage or anastomosis.
Dumping syndrome	Uncomfortable feeling of nausea, dizziness, heart palpitations, sweating/cold sweats, faintness/fatigue and diarrhea connected to the intake of sweet or even fatty food.
Duodenum	The first 30 cm of the small intestine right after the stomach. Bile and pancreatic juices enter the duodenum viaducts from the liver and pancreas.
Obesity	Associated with severe overweight or adipose tissue.
Gastric	Associated with the stomach.
Gastric bypass	Operation designed to make part of the stomach nonfunctional.
Gastrointestinal	Associated with the stomach and intestines.
Gastroplasty	Operation for morbid obesity designed to reshape the stomach.
Genetic	Associated with hereditary properties.
Herniation	Hernia formation.
Hypertension	High blood pressure.

Ileum	Approx. three-meter long part of the small intestine; responsible for absorption of food.
Jejunum	Approx. three-meter long part of the small intestine; responsible for digestion of food.
Cardiovascular	Associated with the heart and blood vessels.
Clinically severe obesity	BMI of 40 or more; a life-threatening weight level. Also called morbid obesity.
Co-morbidity	Debilitating condition or illness (such as arthritis and high blood pressure) in conjunction with clinically severe obesity or obesity-related health condition.
Contraindication	Symptom or condition that renders a particular line of treatment improper or undesirable.
Criteria	Used to choose suitable candidates for surgery.
Laparoscopy	Method for visualizing and treating intra-abdominal problems with long fiber-optic instruments without making a large incision.
Digestion	The process in which food is broken down by the stomach and through the parts of the small intestine into parts that can be absorbed.
Mortality	In relation to illness, an increased risk of death.
Multidisciplinary	Team for evaluating and treating clinically severe obesity. Includes evaluation and treatment in the following areas: surgery, internal medicine, nutrition, psychiatry and physical therapy.
Obstruction	Narrowing of an anastomosis or part of the digestive tract that delays the normal passage of food and waste products.
Psychotherapy	Evaluation and treatment of mental health issues.
Roux-en-Y gastric bypass	A surgical method of reconnecting the stomach and upper part of the small intestine in a rough Y-shape.
Illness/disease	A process that impairs health and/or average life expectancy.
Morbid obesity	BMI of 40 or more; a life-threatening weight level. Also called clinically severe obesity.
Strictures	Narrowing of an anastomosis or part of the intestines, often as the result of scarring or a wound.
Therapy	Treatment.
Type 2 diabetes	Disruption of glucose and insulin metabolism.

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