

# Bariatric surgery (Weight loss surgery)

## Introduction

Weight loss surgery, also called bariatric surgery, is used as a last resort to treat people who are dangerously obese (carrying an abnormally excessive amount of body fat).

This type of surgery is only available to treat people with potentially life-threatening obesity when other treatments, such as lifestyle changes, haven't worked.

Potentially life-threatening obesity is defined as:

having a body mass index (BMI) of 40 or above

having a BMI of 35 or above and having another serious health condition that could be improved if you lose weight, such as type 2 diabetes or high blood pressure

For people who meet the above criteria, weight loss surgery has proved to be effective in significantly and quickly reducing excess body fat.

However, it is always recommended that you try to lose weight through a healthy, calorie-controlled diet and increased exercise before you consider weight loss surgery, as surgery carries a risk of complications and requires a significant change in lifestyle afterwards.

## Types of weight loss surgery

The two most widely used types of weight loss surgery are:

gastric band, where a band is used to reduce the size of the stomach so a smaller amount of food is required to make you feel full

gastric bypass, where your digestive system is re-routed past most of your stomach so you digest less food and it takes much less food to make you feel full

Several other surgical techniques may be recommended in certain circumstances.

### Life after weight loss surgery

Weight loss surgery can achieve often impressive results in the amount of weight lost, but it should not be seen as a magic cure for obesity.

People who have had weight loss surgery will need to stick to a rigorous and lifelong plan afterwards to avoid putting weight back on or long-term complications.

This plan will include:

a carefully controlled diet

regular exercise

The rapid weight loss may cause relationship problems, for example with a partner who is also obese, and it may lead to unwanted loose folds of skin, which may need further surgery to correct.

Also, many people with mental health problems, such as depression or anxiety, find that these problems do not automatically improve because they have lost weight.

It is important to have realistic expectations about what life after weight loss surgery will be like.

### Risks

As with all types of surgery, weight loss surgery carries the risk of complications, some of which are serious and potentially fatal, such as:

internal bleeding

a blood clot inside the leg (deep vein thrombosis)

a blood clot or other blockage inside the lungs (pulmonary embolism)

It is estimated that the risk of dying shortly after gastric band surgery is around 1 in 2,000. A gastric bypass carries a higher risk of around 1 in 100.

However, this risk can be as high as 1 in 40 if you have other risk factors such as high blood pressure or a BMI of 50 or above.

### Results

As long as a person is willing and able to stick to their agreed plan afterwards, surgery can effectively reduce their weight and treat conditions associated with obesity, such as diabetes.

Recent research carried out in America found that on average:

People with a gastric band will lose around half their excess body weight.

People with a gastric bypass will lose around two-thirds of their excess body weight.

Both techniques also lead to a considerable improvement (and sometimes a complete cure) of obesity-related conditions, such as diabetes or high blood pressure.

### Who can use weight loss surgery?

Weight loss surgery is only recommended for people with a BMI of 40 or more, or a BMI of 35-40 and a serious health condition that could be improved if you lose weight, such as type 2 diabetes or high blood pressure.

You have tried all the appropriate non-surgical methods, such as diet and exercise, but have failed to achieve or maintain a beneficial level of weight loss for at least six months.

You agree to commit to long-term follow-up treatment after surgery at a specialised obesity service.

You are fit and healthy enough to withstand the anaesthetic (painkilling medication) and surgery.

Read the full NICE guidelines on treating obesity (PDF 483Kb).

### When weight loss surgery isn't suitable

Weight loss surgery may not be recommended if you have a serious illness that would not be improved after the operation, such as:

advanced cancer

liver disease

Weight loss surgery is also unlikely to be recommended if a mental health condition or other underlying factor means you would be unable to commit to long-term follow-up and lifestyle changes.

Examples include:

schizophrenia for which you are refusing to seek treatment

actively abusing alcohol or drugs

a previous history of not complying with medical recommendations about your care

Children

Weight loss surgery would only be considered to treat obese children in exceptional circumstances, and only if the child is physically mature (this would be around the age of 13 for girls and 15 for boys).

Most experts in obesity would only recommend surgery as a treatment of last resort for children who are severely morbidly obese (a BMI of 50 or above), or who are morbidly obese (a BMI of 40 or above) and also have a serious health condition that would improve if they lost weight.

### Getting ready for weight loss surgery

Weight loss surgery and adapting to life after surgery is a challenging process, requiring the input of not just the surgeon but many different medical professionals working together as a team.

This is known as a multidisciplinary team (MDT) and it may consist of:

a surgeon

an anaesthetist

a dietitian

a psychologist

a gastroenterologist (doctor who specialises in treating digestive conditions)

a specialist weight loss surgical nurse, who will usually be your first point of contact

Most MDTs operate out of specialist bariatric surgery units, which are typically based in larger hospitals.

Before your weight loss surgery can take place, you will probably be referred to your nearest specialist unit for an assessment, to see if you are a suitable candidate for surgery.

### Assessment

Your assessment may consist of three main phases:

physical assessment

psychological assessment

nutritional assessment

Physical assessment

The purpose of the physical assessment is to check whether you have any health problems or there are other factors that could complicate your surgery.

You may receive the following tests:

blood tests

an electrocardiograph (ECG), where electrodes are used to measure the electrical activity of your heart

chest X-rays

spirometer – a machine that measures how well you can breathe in and out

ultrasound scan – this uses sound waves to build up a picture of the inside of your body and is useful for spotting conditions such as gallstones and non-alcoholic fatty liver disease

Psychological assessment

The psychological assessment determines whether:

you have any mental health conditions or emotional problems that could prevent you sticking to your lifestyle plan after surgery

you have developed unhealthy patterns of eating, such as binge eating, that could cause problems after surgery

you have realistic expectations of what life will be like after surgery

The process of assessment can differ from unit to unit, but it is likely you will be asked questions about:

how obesity is affecting your emotions

how obesity is affecting your relationships with others

how obesity is affecting your daily activities

whether you are currently taking medication or seeking treatment for a mental health condition

your current pattern of eating and your willingness to change the pattern after surgery

what benefits you expect surgery to bring you and how you feel your life will be after surgery

Having a mental health condition such as depression, or an eating disorder does not automatically mean you are not suitable for surgery. However, surgery may be delayed until it is under control.

Nutritional assessment

The nutritional assessment has two main purposes.

The first is for the dietitian to obtain a detailed history of your current diet and associated patterns of eating and how these have contributed to your obesity.

The second is to ensure that you fully understand the dietary commitments you will need to make after surgery, which may include:

improving the nutritional content of your meal

eating small amounts of food slowly rather than rushing through a meal as quickly as possible

Your dietitian may also recommend that you go on a calorie-controlled diet for several weeks or months before surgery. This is because losing even a modest amount of weight before surgery is known to reduce the risks of complications, especially if you are going to have keyhole surgery.

How weight loss surgery is performed

The two most widely used types of weight loss surgery are gastric banding, based on restriction, and gastric bypass, which uses a combination of restriction and malabsorption.

Each type of surgery is discussed in more detail below.

### Gastric banding

Gastric banding is usually performed as a type of laparoscopic (keyhole) surgery, where a series of small incisions are made in the abdomen, rather than one large incision. The advantage of this type of surgery is it causes less pain afterwards and has a faster recovery time.

However, laparoscopic surgery may not always be possible in severely morbidly obese people.

Gastric banding is carried out under general anaesthetic, which means you will be asleep during surgery and will not feel any pain.

The surgeon makes the incisions in your abdomen and then inserts an instrument known as a laparoscope through one of the cuts. A laparoscope is a thin, rigid tube containing a light source and a camera. The camera relays images of the inside of your abdomen to a television monitor.

Other small instruments are placed through the cuts to place the band around your stomach, effectively dividing your stomach into two, leaving a small pouch at the top of the stomach.

It will take less food to fill the pouch, so it will take less food to make you feel full.

The band contains an access port through which saline (sterile salt water) can be passed to inflate the band. This allows the band to be adjusted as required after surgery.

The surgery usually takes around an hour to complete.

### Gastric bypass

Gastric bypass is usually performed as a type of laparoscopic surgery where possible, as this causes less pain afterwards and has a faster recovery time.

However, it may not be suitable for severely morbidly obese people.

As with gastric banding, a small pouch is created at the top of your stomach. This pouch is then connected directly to a section of your small intestine, bypassing the rest of the stomach and bowel.

This means that it will take less food to make you feel full and you will also absorb fewer calories from the food you eat.

Bypass or banding?

Both types of surgery have advantages and disadvantages.

There is usually more weight loss after a gastric bypass than after a gastric band.

Most people with a gastric band will lose around half their excess body weight, whereas most people with a gastric bypass will lose around two-thirds of the excess body weight.

However, because it is more technically demanding, a gastric bypass carries a higher risk of complications, including death.

The risk of any sort of complication after a gastric band is around 1 in 10 compared to 1 in 5 for a gastric bypass.

The risk of death after a gastric band is around 1 in 200 compared to 1 in 100 for a gastric bypass.

A gastric band is reversible, so if you find it difficult to cope with the restrictions associated with life after surgery, you can have the band removed.

A gastric bypass, on the other hand, cannot be reversed. You will also be required to take nutritional supplements for the rest of your life if you have a gastric bypass.

Discuss the advantages and disadvantages of both types of surgery with your surgical team.

### Other types of bariatric surgery

Other types of weight loss surgery, which are less commonly used, are outlined below.

#### Sleeve gastrectomy

A sleeve gastrectomy is a type of surgery used to treat extremely morbidly obese people (with a BMI of 60 or above).

Such a high level of obesity means that performing a gastric band or bypass would not be safe as both procedures carry a very high risk of causing complications in people of that weight.

During surgery, a section of the stomach is surgically removed, reducing the size of the stomach by three-quarters. The short to medium term weight loss should be around 60-70%.

Once this weight loss has been achieved, it should be possible to perform either a gastric band or bypass safely.

#### Bilo-pancreatic diversion

A bilo-pancreatic diversion is similar to a gastric bypass except a much larger section of the small intestine is bypassed, meaning you will absorb even fewer calories from the food you eat.

A bilo-pancreatic diversion can achieve a good level of weight loss (up to 80% of excess body weight) but it carries a high risk of complications and can cause unpleasant side effects, such as unpleasant-smelling diarrhoea.

Because of this, a bilo-pancreatic diversion is usually only recommended when it is felt that rapid weight loss is required to prevent a serious health condition, such as heart disease, from getting worse.

### Intra-gastric balloon

An intra-gastric balloon is a soft silicone balloon that is surgically implanted into your stomach. The balloon is filled with air or saline solution (sterile salt water), and so takes up some of the space in your stomach. This means you do not need to eat as much before you feel full.

This procedure is only temporary, and the balloon is usually removed after six months. The procedure is useful if you do not meet the criteria for the other types of surgery, for example because you are too obese.

An intra-gastric balloon procedure can usually be done without making an incision in your abdomen. Instead, the balloon can be passed through your mouth and down into your stomach using an endoscope (a thin, flexible tube that has a light and a camera on one end). Read more information about a gastroscopy.

### Recovering from weight loss surgery

After weight loss surgery, you will need a few days to recover. It may also be several weeks or months before you can resume normal activities, depending on the type of surgery you have.

### Recovering from a gastric band operation

When you wake after surgery, you will probably have some pain at the site of the surgery. This is normal and should pass within a few days.

Blood clots are an uncommon but serious complication that can occur after banding and can include:

deep vein thrombosis – a blood clot that develops inside one of your legs

pulmonary embolism – a blood clot that develops inside the lungs

To reduce the risk of blood clots, you may be given a blood-thinning medication, such as heparin, and compression stockings to wear.

Once you feel well enough, move around as much you can as this will further reduce your risk of blood clots.

For the first 24 hours, you will only be allowed to drink a small amount of liquids. This is because your stomach will be very swollen and sore from the effects of the surgery.

Gradually, small amounts of solid food will be introduced into your diet. Read about recommendations for weight loss surgery.

Gastric band surgery may be carried out as a day case and most people are well enough to leave hospital within 24 hours of surgery. You can resume normal activities within four to six weeks.

Four to six weeks after surgery, your stomach should have healed enough that your band can be adjusted by inflating it with saline (sterile salt water).

This is done by inserting a needle via the access point through which the saline is pumped. The band will then inflate, which will constrict the upper pouch of your stomach. The whole process takes around 15 minutes. This is sometimes done after numbing your abdomen with a local anaesthetic, using an X-ray to locate the band.

Often, this process of adjustment is a fine balancing act. For example, if the band is too loose you may not lose weight, but if the band is too tight, you may vomit after eating.

Therefore, it can take a number of sessions before the ideal adjustment for your band is reached.

Recovering from a gastric bypass

Once you wake after surgery, you will probably have a drip in your arm, to provide your body with liquids, and a tube in your bladder, known as a urinary catheter, to drain urine out of your bladder.

These tubes will be removed once you are well enough to get out of bed.

Again, you may be given blood-thinning medication and compression stockings to wear to help prevent blood clots.

You will only be allowed a liquid diet immediately after surgery, and solids will be slowly introduced into your diet.

Most people are well enough to leave hospital one to four days after surgery and resume normal activities within three to five weeks.

### Recovering from other types of weight loss surgery

The recovery time for other less commonly used types of weight loss surgery are:

sleeve gastrectomy – one to four days to leave hospital and four to six weeks to resume normal activities

bilo-pancreatic diversion – one to four days to leave hospital and three to six months to resume normal activities

gastric balloon – fitting a gastric balloon is a non-invasive procedure (does not involve making incisions in your body), so you should be able to leave hospital on the same day and resume normal activities almost immediately

The advice about adopting a liquid diet immediately after surgery and then gradually introducing small amount of solids also applies here.

### Life after weight loss surgery

It is very important that you stick to your recommended diet plan after your surgery.

Diet plans can differ between specialist centres and depending on your individual circumstances, but most people will be given a plan similar to the ones described below.

### Diet after a gastric band operation

Your diet after a gastric band operation will progress over three main stages:

In the first four weeks after surgery, you will only be able to drink liquids and eat small amounts of pureed food, such as mashed potato.

In weeks four to six, you can you have soft food, such as chicken.

After six weeks, gradually resume a healthy diet based on eating small amounts of nutritional food.

### Each stage is discussed in more detail below.

#### First four weeks

It is important that any food you eat during this period is pureed. Attempting to eat solid foods at this stage could put pressure on the band and damage it.

Pureed food has the same texture and consistency as baby food. You can puree food using a food processor, hand-held blender or potato masher.

Additional fluids, such as sauces or water, may be required to soften some types of food.

Aim to eat small portions four to five times a day. A portion is around 100g or five to six tablespoons of food. Eat all your meals slowly, taking small mouthfuls.

Stop eating as soon as you feel full. Due to the position of the band, you will probably experience a feeling of fullness or tightness in your chest rather than in your stomach.

Drink around 1.5 litres (2.5 pints) of water a day. Drink small glasses, around 100-200ml, between meals but never with your meals.

If you experience repeated episodes of vomiting after eating, it may be a sign that you are eating too much or that your band needs to be adjusted. Contact your surgical unit for advice.

Weeks four to six

Continue to eat a similar diet as you did for the first four weeks, but your food no longer has to be pureed, although it should be soft.

For example, you could eat:

wholewheat breakfast cereals mixed with milk

porridge

mashed potatoes and melted cheese

soup

yoghurt

rice pudding

After six weeks

After six weeks, you will be ready to adopt a long-term diet that you will need to stick to for the rest of your life. Your band should now be adjusted correctly so you should need to eat much less to satisfy your appetite.

While weight loss is an important goal of your diet, do not neglect the nutritional content of your diet. See the box, above right, for more information on what makes a healthy, nutritional diet.

The British Obesity Surgery Patient Association (BOSPA), a charity for people who could benefit from surgery, has six golden rules you will need to follow to get the maximum benefit from your gastric band:

Only eat three meals a day.

Avoid snacking between meals. If you are following your recommended guidelines, there is no reason why you should feel hungry between meals.

Eat solid food. While soft foods may be easier to digest, they usually contain more carbohydrates and fat and make you feel less full than solid foods.

Eat slowly and stop eating as soon as you feel full. Cut your food into very small chunks, around the size of a pencil-top rubber, then chew each chunk 10-25 times before swallowing. Stop eating once you feel a sensation of fullness or tightness in your chest. Overeating or eating too fast could cause unpleasant symptoms such as pain and vomiting.

Do not drink during meals. This can flush food out of your stomach pouch and make you feel less full. Avoid drinking fluids 30 minutes before a meal and for an hour afterwards.

Avoid drinking high-calorie drinks, such as cola, alcohol, sweetened fruit juices and milkshakes. These types of drink will quickly pass out of your stomach and into your small intestine, increasing your calorie intake. Ideally, drink water or zero-calorie drinks, such as diet cola or diet lemonade.

### Diet after a gastric bypass

The progression of diet stages after a gastric bypass is broadly similar to those after a gastric band:

In the first week after surgery, drink liquids only (this does not include pureed food).

In weeks two to four, you can eat pureed food in the same quantities (100g) and frequencies (four to five times a day) as described above.

In weeks four to six, you can eat soft food.

After six weeks, gradually resume eating a healthy diet.

The golden rules above also apply to your diet after a gastric bypass.

However, you need to be aware of several additional issues.

Firstly, you will need to avoid eating food that is high in sugar, such as chocolate, cakes, sweets and biscuits. This is because your bypass will

affect how you digest sugar, and any sugar you eat will trigger your body to produce high levels of insulin.

The excessive amount of insulin can cause a number of unpleasant symptoms that are collectively known as dumping syndrome. Symptoms of dumping syndrome include:

nausea

abdominal (tummy) pain

diarrhoea

light-headedness

Secondly, you will need to take daily vitamin and mineral supplements, as your small intestine will no longer be able to digest all the vitamins and minerals your body needs from your diet.

The dosage and type of supplements can vary from case to case, but most people are required to take:

a multivitamin supplement, which contains a combination of different vitamins

a calcium supplement (the body requires calcium to maintain healthy bones)

an iron supplement

Diet after other types of weight loss surgery

The recommended diet after other types of weight loss surgery is likely to be similar to the advice above.

Your specialist centre will be able to provide more detailed advice.

Exercise after weight loss surgery

Losing weight and then maintaining a healthy weight does not simply involve reducing the amount of calories you eat. Burning calories while exercising is also important.

Regular exercise also has additional health benefits other than weight loss. These include reducing your risk of developing heart disease and some types of cancer, and boosting your self-esteem and wellbeing.

You will probably be given an exercise plan that starts gradually with low to moderate amounts of physical exercise, such as 10 minutes a day, before the amount is gradually increased.

The exercise should be intense enough to leave you feeling out of breath and getting your heart beating faster.

Recommended types of physical exercise include:

activities that can be incorporated into everyday life, such as brisk walking, gardening or cycling

supervised exercise programmes

activities such as swimming, walking (where you aim to walk a certain number of steps a day) and stair climbing

Choose physical activities that you enjoy as you will be more likely to continue doing them.

### Results of weight loss surgery

As long as you stick to the recommendations on diet and exercise, all types of weight loss surgery can achieve good and often impressive results.

However, rapid weight loss can cause complications. Read more information about the risks of weight loss surgery.

Gastric band

A person with a gastric band should expect to lose 50% of their excess body weight within two years.

The weight loss is a gradual process with:

35% of excess weight lost within six months of surgery

40% of excess weight lost by 12 months

50% of excess weight lost by 24 months

Also expect to see a marked improvement in health conditions related to obesity, particularly:

type 2 diabetes

gastro-oesophageal reflux disease (GORD)

obstructive sleep apnoea

high cholesterol

Most people also report an improvement in their overall quality of life in terms of:

day-to-day pain and discomfort

general physical health

mental health

### Gastric bypass

A person with a gastric bypass should expect to lose 70% of their excess body weight within two years.

The weight loss tends to be more rapid in the first year (60% of the excess weight lost) then slows in the second year, with only an additional 10% weight loss.

Again, expect to see a marked improvement in the health conditions above.

## Risks of weight loss surgery

The rapid weight loss associated with weight loss surgery can cause a number of side effects and has a number of risks.

These are outlined below.

### Complications immediately after surgery

Complications that can occur during or immediately after surgery include:

infection – this affects around 1 in 20 people

blood clots in the legs (deep vein thrombosis) or lungs (pulmonary embolism) – this affects around 1 in 100 people

internal bleeding – this affects around 1 in 100 people

### Excess skin

While weight loss surgery can successfully remove the fat in the body, it cannot cause skin to revert to its pre-obesity tightness and firmness.

Therefore, if you were obese, especially for many years, you may be left with excess folds and rolls of skin, particularly around the breasts, tummy, hips and limbs.

These folds and rolls normally become most apparent 12-18 months after surgery. They can look ugly and are difficult to keep clean, so you may be vulnerable to developing rashes and infections.

Cosmetic surgery can be used to remove the excess skin. However, as this treatment is for cosmetic and not clinical reasons, it is not available on the NHS.

The price for a course of skin-removal treatment can range from £1,500 to £6,000 depending on the amount of skin that needs to be removed.

## Gallstones

Around 1 in 12 people will develop gallstones after weight loss surgery, typically 10 months after surgery.

Gallstones are small stones, usually made of cholesterol, that form in the gallbladder.

In most cases, gallstones do not cause any symptoms. However, if they become trapped in a duct (an opening or channel), they can irritate and inflame the gallbladder and cause symptoms, such as:

a sudden intense pain in your abdomen (tummy)

nausea and vomiting

jaundice (yellowing of the skin and the whites of the eyes)

### Psychosocial effects of surgery

While most people who undergo weight loss surgery report an improvement in their quality of life, several psychosocial effects may be related to rapid weight loss.

Some people have reported relationship problems with their partner as their partner begins to feel nervous, anxious or possibly jealous about their weight loss.

Additionally, social occasions that revolve around food, such as family meals, can become awkward, as it is common to feel self-conscious about your reduced capacity to eat.

It is also common for a person to experience a worsening of mood when their weight stabilises, typically two years after surgery. This is often because many people realise that problems that existed before surgery, such as money worries or difficulties at work, are still there after surgery.

You may find it useful to discuss these issues with people who have also had weight loss surgery. The British Obesity Surgery Patient Association's website contains a service directory of support groups in the UK along with more information.

You can also find more information and tips for dealing with psychosocial effects of surgery such as stress, anxiety or depression in the Moodzone.

### Stomal stenosis

A common complication in people with a gastric bypass is that the hole (stoma) that connects their stomach pouch to their small intestine becomes blocked by a piece of food. This is known as stomal stenosis and is thought to occur in one-fifth of people with a gastric bypass.

The most common symptom of stomal stenosis is persistent vomiting.

Stomal stenosis can be treated by directing a small flexible tube, known as an endoscope, to the site of the stoma. A balloon attached to the endoscope is inflated to unblock the stoma.

The best way to prevent stomal stenosis is to always cut food into small chunks, chew the chunks thoroughly and avoid drinking during meals.

### Gastric band slippage

Gastric band slippage is a complication that affects around 1 in 50 people with a gastric band.

As the name suggests, the band slips out of position. This means that the stomach pouch becomes bigger than it should be. This can cause symptoms such as:

heartburn

nausea

vomiting

Further surgery will be required to repair the band.

Food intolerance

Around 1 in 35 people with a gastric band develop a food intolerance, often many years after their surgery.

A food intolerance is when your body is unable to tolerate certain foods, such as red meat or green salad, resulting in a number of unpleasant symptoms such as:

nausea

vomiting

gastro-oesophageal reflux disease (GORD)

The reason why a food intolerance can develop after surgery is unclear.

In most cases, avoiding foods that trigger a reaction should help improve symptoms, but if you have persistent symptoms associated with a number of different foods, it may be necessary to remove the band and replace it with a gastric bypass.

Death

No surgery is entirely safe and all surgical procedures carry a risk of death, however small.

Death can occur for a number of reasons during or shortly after weight loss surgery, including:

a pulmonary embolism that causes serious breathing difficulties and then death

internal bleeding

infection

heart attack

stroke

The risk of dying is:

1 in 2,000 shortly after a gastric band

1 in 100 shortly after a gastric bypass

A number of risk factors have been identified that increase the risk of death during or shortly after weight loss surgery. These are:

being over 45 years old

high blood pressure

having a BMI of 50 or above

being male, as obese men tend to weigh more than obese women

having a known risk factor for a pulmonary embolism

Known risk factors for a pulmonary embolism include:

having a previous history of blood clots

pulmonary hypertension, when the blood pressure inside your lungs is particularly high

obesity hypoventilation syndrome, when you have persistent breathing difficulties related to your obesity