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Laparoscopic Sleeve Gastrectomy

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About the author

Associate Professor Michael Talbot started working as a consultant upper gastrointestinal surgeon in 2003, having completed 10 years of training following his internship in 1992–93. He started performing gastric band and gastric bypass surgery in 2003, and in 2004 was one of the first in Australia to perform sleeve gastrectomy and laparoscopic gastric bypass. Since then he has developed a large practice in bariatric and complex upper gastrointestinal surgery.

The surgical practice he works in is one of few in Australia regularly performing gastric band, bypass, sleeve gastrectomy, endoscopic sleeve gastroplasty and revision/corrective surgery for all procedures.

The practice also offers expertise in gallbladder and hernia surgery, repair of complex abdominal wall defects, endoscopic management of gallstones (ERCP), endoscopic oesophageal and gastric tumour therapy and state-of-the-art Barrett's oesophagus treatments. We have a specialised laboratory for the investigation of complex swallowing disorders and reflux, and are involved extensively in research.

We work with other doctors and health professionals as part of an interdisciplinary team to create a work environment focused on patient care, innovation and excellence. It is clear that patients do best when they have a range of people helping to look after them. This booklet is a document that will change over time as we learn more from our patients and from each other.

Dr Jason Maani

Dr Daniel Chan

Dr Jennifer Matthei

Essential information about this booklet

This booklet is intended to explain the Laparoscopic Sleeve Gastrectomy procedure and any issues that you may have before and after the operation. It is not supposed to replace advice given by your doctor or other healthcare professionals, but rather to add to it.

If you have any questions or worries that you wish to discuss with your doctor, please write them down in the space provided. It is important that you understand as much as possible before and after the operation, to aid your weight loss and ensure a healthy lifestyle.

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Laparoscopic sleeve gastrectomy

Sleeve gastrectomy is an obesity surgery that restricts the volume of the stomach to 15–20 per cent of its original size. The surgery itself is performed as a keyhole procedure, through five small incisions in the abdomen. These enable the surgeon to remove a large portion of the stomach from the greater curvature, as seen in Figure 1. The resulting vertical pouch resembles a thin banana of approximately 150 ml capacity. Over time, softening of the stomach wall will usually increase the volume to about 250 ml.

The sleeve has been found to be very effective at causing weight loss. Studies have shown that people are able to lose on average of 45–80 per cent of their excess weight. Because it is a relatively new procedure, little information is available on its long-term effectiveness (more than five years) in causing weight loss, or on the long-term consequences of the procedure.

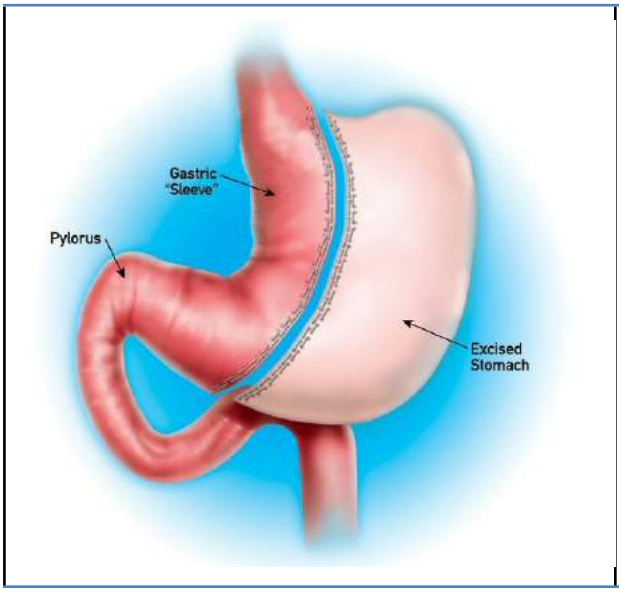

Figure 1. Stomach after sleeve gastrectomy.

History of the sleeve gastrectomy

Initially this surgery was performed as part of a two-stage operation to cause weight loss in severely obese people, for whom a larger operation was thought to be too risky. After the weight loss had plateaued, and other health issues such as diabetes had been improved, the sleeve would then be converted to a gastric bypass (RYGBP) or billiopancreatic diversion (BPD).

Due to its efficacy in causing weight loss, however, the sleeve gastrectomy has gained popularity as a stand-alone procedure, although it has only been performed for around 10 years in Australia. The first reported modern sleeve gastrectomy was performed in Australia in 2004 (which is when I performed my first cases), and has now become a more standardised procedure, taking about 90 minutes.

How the sleeve causes weight loss

The sleeve itself does not make you lose weight. Rather, it is a tool to help restrict the amount of food you eat, by affecting your hunger, capacity and rate at which you consume food. Due to their smaller stomach size, patients find that after eating a much smaller quantity of food than usual they have a feeling of satisfaction (satiation) or a feeling that they have eaten enough. Furthermore, removing part of the stomach alters the hormones released after eating; this prolongs appetite suppression between meals. If a patient uses their operation to eat healthy (low-energy) meals three times a day, they will use more energy than they consume and will lose weight.

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Effectiveness of the sleeve in causing weight loss

Studies have shown that people with a sleeve gastrectomy experience 45–83 per cent excess weight loss (%EWL) after one year. This increases to 70–80 per cent EWL at two years, and similar rates for three years. However, it is impossible to predict exactly how much weight each person will lose, as this depends on many factors, including chance, age, starting weight, medical illness, ability to exercise and resilience. In the end, most people get to a stage where they feel that further weight loss comes at the expense of too much effort and settle at a weight that more or less suits them.

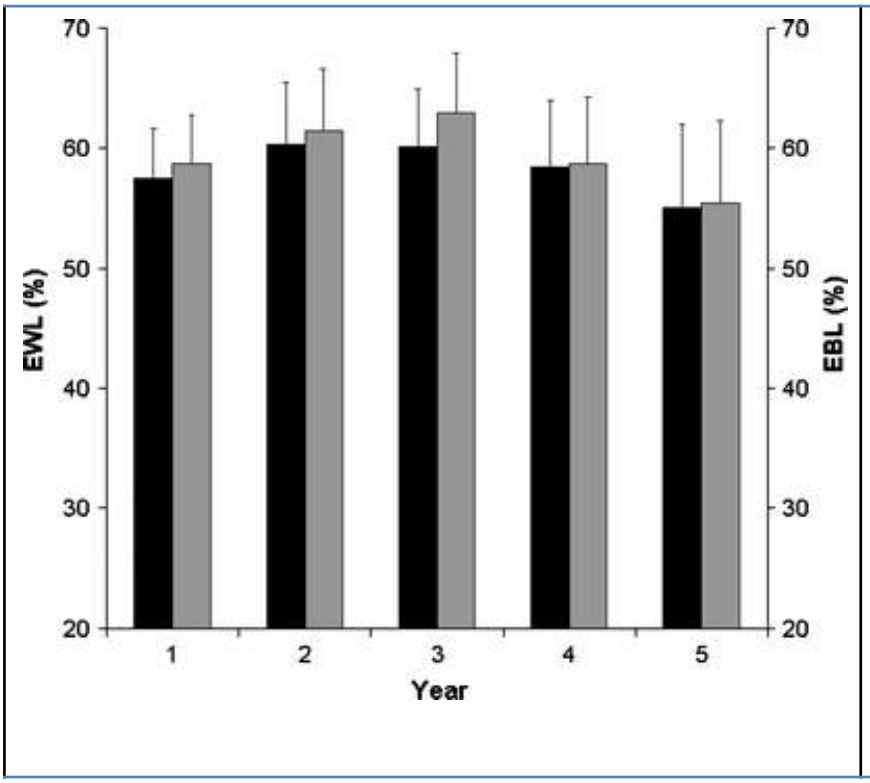

Figure 2. Excess weight loss (EWL) and excess BMI loss (EBL) after five years with the sleeve.[1]

Improvements to health

Weight loss resulting from a sleeve gastrectomy has been shown to markedly reduce the incidence of co-morbidities (associated illnesses) such as diabetes, high cholesterol, joint pain and hypertension (high blood pressure) by more than 75 per cent within the first year. These results are similar to those found with the gastric bypass operations. Other studies have found that up to 75 per cent of participants lowered their dosage, or quit taking altogether, medications for these health problems one year after surgery.

Suitable candidates for sleeve gastrectomy

As with all obesity surgeries, the sleeve gastrectomy should only be performed on people with a BMI greater than 40, or those with a BMI over 35 with other medical co-morbidities such as diabetes or high blood pressure. Patients who are lighter than this run the risk of losing weight but at the expense of complications that can make them worse off. They should have tried other weight loss therapies beforehand but been unable to keep the weight off. Patients with eating disorders such as binge eating or nocturnal eating disorder, and patients who habitually graze or emotionally eat, need to seek treatments for these disorders as well, otherwise the surgery will fail after being initially successful.

The sleeve gastrectomy is non-reversible, unlike the gastric band and gastric bypass, so should only be undertaken by well-motivated people with acceptable operating risks, who are committed to improving their health through substantial weight loss. Furthermore, these candidates should be well informed about the effect the sleeve will have on their lifestyle, through accepting advice on eating

[1] A. Bohdjalian & others. 'Sleeve gastrectomy as sole and definitive bariatric procedure: 5-year results for weight loss and ghrelin'. *Obesity Surgery*, vol. 20, no. 5 (May 2010), pp. 535–40.

and exercise practices. Although the operation is permanent, the effect it has on eating and weightloss may not be permanent even if side effects of surgery are (reflux).

Finally, women who wish to fall pregnant soon after their surgery should be discouraged from doing so until their weight has stabilised, and any nutritional deficiencies have been identified and treated. Women can become very fertile when they lose weight so in order to avoid early pregnancy they are encouraged to use barrier contraception.

Surgical complications

The sleeve gastrectomy requires the stomach to be cut, a large section to be removed and then the two opposing sides of the stomach to be stapled back together (resection). If this resection is not watertight, a gastric staple line leak occurs, allowing stomach contents to leak out into the abdomen. This is the most feared surgical complication, occurring in less than 1 per cent of cases, but requiring intensive hospital-based treatment for about 6–12 weeks. The leak rate is known to be higher for sleeve gastrectomy than for gastric bypass.

Other surgical complications include staple line bleeding (1–2 per cent of cases), haemorrhage (excessive bleeding), bowel injury, wound infection, hernia and post-operative abscess (infection). However, in experienced hands the incidence of all these is low (less than 1 per cent of cases). Surgeons in their first few hundred cases are known to have a greater risk of complications. The risk of death is less than 1 in 500 cases.

Other serious complications stem from the formation of blood clots in the veins (1 in 100 cases), including deep venous thrombosis (1 in 200) or pulmonary embolism (1 in 1000), but these risks are reduced by using blood-thinning medications during surgery and wearing compression stockings.

Long-term negative effects of sleeve gastrectomy

Not all of its potential long-term effects are known. However, if a patient's sleeved stomach causes complications such as reflux or excessive food intolerance, these complications will also be permanent unless other surgical procedures are undertaken to remedy them. For this reason, patients who would under no circumstances wish to have a gastric bypass should think carefully before choosing a sleeve operation. In the long term, some 5–20 per cent of sleeve gastrectomy patients are likely to need a gastric bypass operation, to treat reflux, food intolerance or weight regain.

Vitamin and mineral deficiencies are unlikely to be severe after a sleeve gastrectomy, but if a person eats food that is insufficiently nutritious, or if they vomit often, nutritional deficiencies can occur. Untreated deficiencies can lead to severe complications. We recommend daily multivitamins, blood tests one or two times per year, and bone density scans every one to three years.

Two-thirds of sleeve gastrectomy patients experience gastroeosophageal reflux symptoms at one month after the operation. By two years after surgery this is usually no longer a problem, only occurring in 5–10 per cent of patients. On the other hand, some patients find their previous reflux is cured by the sleeve.

Stomach stretching

Stomach stretching or dilatation will occur as a normal event after surgery, but this is not the main factor causing weight regain, as the stomach will still be smaller than one cup (250 ml) in size. If the stomach tube created at surgery is too large, symptoms of reflux or failure to lose weight can occur, but in general the causes of weight regain in more than 90 per cent of patients are snacking, lack of exercise and poor dietary choices – the same things that caused the original weight problem.

After a sleeve gastrectomy, you have between six and nine months to lose most of your weight, otherwise the operation will not be successful. During this time, you must learn new eating and exercise patterns. If you lapse back into the eating patterns you had prior to surgery, you are likely to return to the weight you were before surgery.

Stomach capacity

After the sleeve gastrectomy, your stomach will hold approximately 150–250 ml, compared to more than 1000 ml before surgery. Your stomach will empty itself of solid food in 10–30 minutes and of soft or liquid food in 5–10 minutes. Because solid food stays in the stomach for longer, patients who eat

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meat, fish, vegetables and fruit will tend to eat less and stay slim, while patients who eat dairy foods, biscuits, chips, other snacks and high-energy drinks (caffè latte, soft drink, fruit juice and alcohol) will regain their weight because their stomach empties very quickly and the food they eat passes through the stomach without resistance.

Choosing the sleeve over other options

There are many different weight loss surgical procedures and other types of treatments available. Before choosing gastric sleeve or any other surgery you need to think very hard about whether this particular treatment is the best one for you. The risks of having the gastric sleeve must be balanced against the risks of continuing in your current state of health. Different people, with different lifestyles and health conditions, suit different operations. This section will help you to understand how these treatments differ and what is the best option for you. For additional information to help you make a well-informed, balanced decision, please see our other information booklets.

Generally, the sleeve requires a short hospital stay of 2–3 days, and patients find it OK to return to work by about two weeks.

As the gastric sleeve is a relatively new procedure, not all of its long-term effects are known, as opposed to the gastric bypass and gastric band operations, which have been common for many years. For this reason, we do not yet know how likely a person is to regain weight years after sleeve surgery, or how many patients may require further surgery.

Figure 3 shows the differences in weight loss following the three types of bariatric surgery.

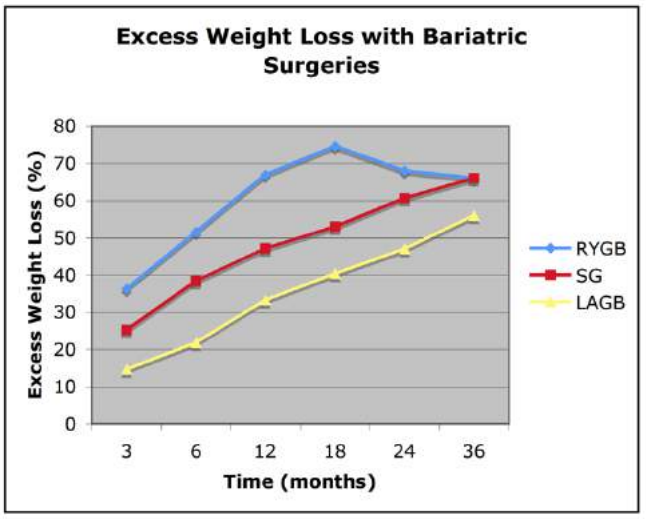

Figure 3. Excess weight loss with the three obesity surgeries.[2, 3]

Over time the weightloss becomes very similar with all operations. While sleeve patients lose weight very quickly, there is a risk of weightgain over time if lifestyle changes are not adhered to.

Comparing sleeve gastrectomy with gastric bypass

The gastric sleeve allows certain important structures in the stomach, such as the pyloric sphincter, to remain, thus the 'dumping syndrome' of the gastric bypass occurs less often. As the sleeve does not affect the small intestine, nutritional deficiencies are less likely, so patients with diseases affecting the small intestine, such as Crohn's disease, can be candidates for this procedure. A patient is less likely to experience vomiting or bowel blockage, because the stomach emptying into the small intestine remains the same. As a large portion of the stomach is removed, they are less likely to have a

[2] J. Armstrong & S.P. O'Malley, 'Outcomes of sleeve gastrectomy for morbid obesity: A safe and effective procedure?' *International Journal of Surgery*. vol. 8, no. 1 (2009), pp. 69–71.

[3] L. Biertho & others, 'Laparoscopic gastric bypass versus laparoscopic adjustable gastric banding: a comparative study of 1,200 cases'. *Journal of the American College of Surgeons*. vol. 197, no. 4 (2003), pp. 536–45.

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stomach ulcer. While the operative risks are similar to those of the gastric bypass procedure, there are lower risks of complications months or years after surgery.

A sleeve gastrectomy may not lead to as much weight loss as a gastric bypass. A gastric bypass makes many patients intolerant to sweet and fatty foods (by the same mechanism that causes ‘dumping’) and this makes weight loss a bit easier. If a patient is not satisfied with the sleeve it can be converted into a gastric bypass at a later date for more weight loss, but this would require a second operation.

As with other weight loss operations, the volume of the stomach is decreased, but patients must eat good, nutritious food and avoid eating junk. It is possible to cheat by eating foods high in calories, such as milkshakes, cheese, dips, chocolate, ice cream and soft drinks. This will lead the patient to lose less weight than desired, and can even lead to patients regaining all of their lost weight. The sleeve acts only as a tool to allow someone to lose weight; to realise its full benefit they must make a lifelong commitment to eat correctly and exercise. This is why it is necessary to have tried traditional dieting before surgery – to understand the energy content of foods and the importance of exercise.

Comparing sleeve gastrectomy with gastric band

Unlike the gastric band, the sleeve requires no adjustments after the operation, and is thus called a set-and-forget procedure. Another advantage is that there is no foreign object inside the patient. However, follow-up is still necessary –quite frequently at first, then once or twice a year for your entire life, to make sure your weight loss is progressing well and the operation has had no negative affects on your health or wellbeing. The gastric sleeve is well suited to patients who live far away from their surgeon, or who have difficulty contacting their surgeon frequently.

Unlike the gastric band, the gastric sleeve puts fewer limits on the *types* of foods one can eat, affecting only the *amount*, so eating meat and bread is often OK.

Unlike the gastric band, the sleeve gastrectomy is not reversible, nor can it be made looser or tighter over time to suit the patient. The stomach may stretch, but it cannot grow back, so this surgery is a commitment for life. For this reason, the sleeve is riskier than the band.

Before the operation

The most important thing to do before deciding about sleeve gastrectomy surgery is to have a discussion with the surgeon about your weight problem and how it affects you. If you wish to undergo treatment for your weight, you should have an idea about what your goals are and whether these can be achieved by having this procedure. If the operation is unlikely to give you what you want, you should consider something else.

My goals:

Tests and consultations

After an initial consultation you will have some blood tests done, so we can assess your sugars, thyroid, blood count and vitamin levels. You will then need one or more further consultations, depending on how you feel. We should obtain approval from your general practitioner (GP), as they will wish to be involved in your post-operative care. Even if you are unsure about whether your GP supports your decision to have weight loss surgery, you should discuss it with them first. Patients with a good support team do the best, and a GP, spouse/partner, friends and family who are all supportive are invaluable. Patients who choose to go it alone will not fare so well.

We will talk about your dieting history and assess any medical problems you have. Some medical problems may require further assessment and treatment to make you as fit as possible before your operation. In general I prefer a patient to have at least two consultations with me or my colleagues prior to surgery.

After we have booked a date for your surgery you will need to go on a very low calorie diet for 2–4 weeks before the operation. During this time you should lose about 2–4 kg per week.

Very low calorie diet

The very low calorie diet consists of three liquid meal replacements per day. This gives your body the minimum energy it needs but has all the nutrition of a balanced diet: macronutrients (carbohydrates, protein, essential fat) and micronutrients (vitamins and minerals). Suitable brands include Optifast, Slimfast, Tony Ferguson etc and are available from your local chemist. We will give you instructions about other foods to consume with the program.

Purpose of the diet

There are three benefits to the pre-operative diet:

- Most of the fat tissue you lose first with these diets comes off your liver and from around your internal organs. Losing this fat makes the operation faster, safer, and significantly less painful. Weight loss of just 10 per cent leads to a reduction in medical risks of 50 per cent and significantly improves your fitness, which aids in recovery.
- Weight loss reduces the severity of weight-related illness very quickly. This makes the anaesthetic safer.
- The diet will accustom you to the post-operative liquid diet. Having this diet before the operation allows you to find low-calorie drinks you like while you're in a less stressful situation.

Choice of diet drinks

If you don't like a particular diet drink, try a different brand or switch to milkshakes, soups, bars or desserts. In general the brands with the greatest range of flavours seem to be more popular. If you cannot find something you can tolerate, you should discuss other short-term or rapid weight loss options with our dietitian.

Seeing a dietitian

You need to see a dietitian before the surgery. Changing how you eat is central to weight loss, and often people can be confused by the different advice they have received in the past. A dietitian is available to see you before and after the operation, and most people get significant benefit from seeing her. A dietitian can help you set and work towards weight loss goals through meal planning, education on the right eating practices, portion control and exercise.

Who else should I see before surgery?

You need to get the go-ahead from your GP before the operation, to ensure your body is healthy enough for the strain of the operation and beyond.

A psychologist is available if you find you have issues that need to be tackled, so don't be afraid to ask. If you have had any psychological illness in the past you will need to let us know, and discuss your decision to have surgery with the person who helps manage this condition. Having surgery is stressful and also may change your requirement for some of your regular antidepressants etc.

Smoking

You should quit smoking before you undergo any surgery, particularly obesity surgery, as smoking increases your risk of blood clots and other complications. At the least, you should stop smoking several weeks before surgery.

The gastric sleeve operation

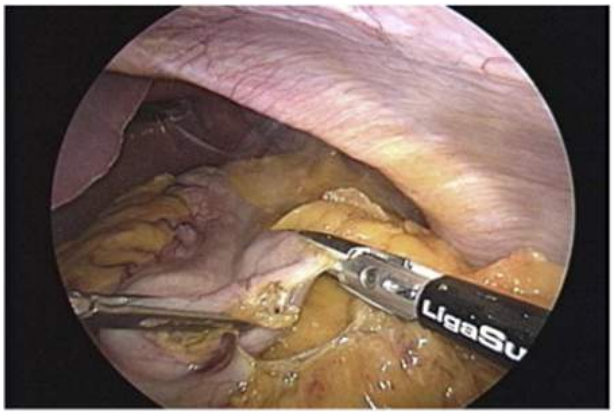
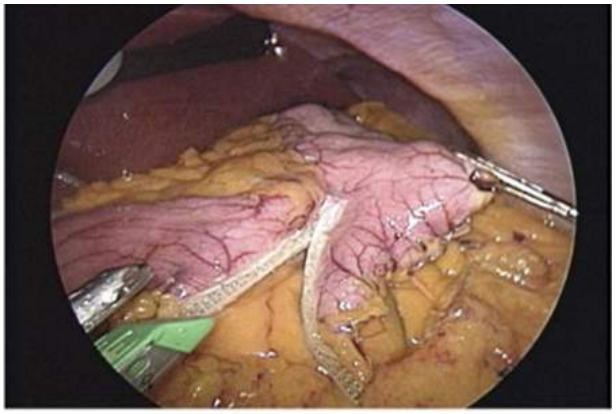
On the day of the operation you should eat and drink nothing for six hours before your scheduled operation time. Some waiting in hospital is to be expected.

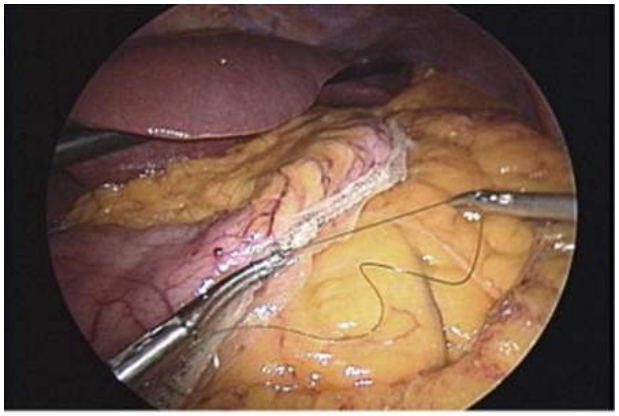
You can take your normal medications with a sip of water at the normal time, but you will need to stop strong blood-thinning medications (Plavix, Asasantin, Warfarin etc.) 7–10 days beforehand. Patients on aspirin can usually continue to take it. Most diabetes medications can usually be taken, but often at half your usual dose, while it is usually best to stop taking Metformin 48 hours before the operation.

You should have had some contact with your anaesthetist before the operation, although you probably won't meet them until you have been admitted to hospital. A drip will be put into your arm to give you medications and then you will be wheeled into the operating room. You will see a lot of people bustling around, but don't be concerned, as they are all there to help you.

The surgical procedure

Videos and photographs of the gastric sleeve procedure can be seen online. Below is a step-by-step guide to the sleeve operation. If you do not like to see such images, please skip the next page!

	Once you are asleep, small incisions (5–15 mm in size) will be made in your abdomen to allow placement of a camera and operating instruments (which look like chopsticks).
	**The left side (greater curvature) of the stomach is separated away from the blood vessels that supply it, and from the sheet of flesh that connects it to the abdominal wall (greater omentum).**
	**The left side of the stomach is then simultaneously cut away and the opposing sides stapled together, leaving only a tube of stomach remaining.**

	**The stapled sides of the new tubular stomach can be sewn together for reinforcement.**[4]

[4] J. Moy & others, 'Laparoscopic sleeve gastrectomy for morbid obesity'. *The American Journal of Surgery*. vol. 196, no. 5 (2008), e56–e9.

Dissolving stitches are put in the skin and dressings are put on the wounds. You will wake up in the recovery unit around 10–30 minutes after the operation and will feel quite sleepy for a few hours.

Once you are awake and feeling reasonably comfortable you will go up to the ward for the night. You can have water and painkillers. Injectable painkillers will be available for the first 24–48 hours.

After the operation

Immediately after the operation you will find that you have no hunger. A couple of mouthfuls of liquid or yoghurt will be enough to make you feel satisfied and able to stop eating. This feeling changes over days or weeks as bruising around the stomach slowly settles.

Hospital stay

About 90 per cent of patients go home two days after surgery. At this point you will get instructions about what to eat and drink.

After the hospital

After about one week the wounds should be almost healed and the dressings can come off. You should avoid swimming for another week or two but you can start light exercise.

At 2–3 weeks after the operation you will have a follow-up appointment, where we will discuss how you are feeling, any complications you may be having and your eating habits.

Going back to work

It depends on how you feel, and your circumstances, but most people go to work 2–4 weeks after their surgery.

What will be different after my sleeve gastrectomy?

Food habits

Amount

Our modern perceptions about much food we need to eat to be healthy are incorrect. Most of us have greater access to food than at any other time in history, and virtually everyone you know overeats most of the time. It is extremely unlikely for someone to starve or become malnourished with a sleeve, but you will have to work hard to manage your own and other people's expectations about how much you should eat. This is the hardest thing that you will have to do, but it is also the most important. If you or others believe that you 'must' eat more food then you will simply not lose weight, or will fall well short of your goals. Eating less food may mean you miss out on extra calcium, iron, folate, fibre or other substances, but these can easily be mixed in with the diet or supplemented.

Studies of people who have lost weight (by any method) show that successful **maintenance** of lost weight is usually achieved by those who:

- consume 1000–1300 calories a day
- exercise enough to burn off 300 calories a day (in effect giving them a daily intake closer to 1000 calories)
- consume a controlled diet with restricted food choices (they say 'no' a lot)
- realise that weight loss is precious, and weight regain difficult to recover from.

Having an operation to lose weight doesn't change the way you lose weight it only makes it easier because your capacity and appetite are smaller. If someone maintaining their weight is having approximately 1000 calories a day, then to lose weight they probably need to eat less than this or do a significant amount of vigorous exercise. It appears that many people losing weight probably eat about 600–800 calories per day.

Frequency

Don't believe the slogan that we need to 'eat little and often'. People with weight problems can manage the 'often' but not the 'little'. Managing portion control is extremely difficult at the best of times, and if you expose yourself to many eating opportunities during the day you will simply expose yourself to more opportunities to make an error. Unfortunately you cannot 'prime' or stimulate your metabolism in any way other than with exercise, and more unfortunately, you will find that as you lose

more and more weight, your body will try harder and harder to fight you by hanging on as hard as it can to every calorie you eat. This will have the effect of making your body more efficient or, in effect, ‘slowing your metabolism’.

Breakfast

A lot of people who have had surgery do not feel like eating breakfast. If you are not hungry in the morning, try to alter your habits so you have your first meal when you actually want it. For a lot of people this is late morning, in which case they have breakfast while others are having morning tea. Another alternative is to combine this meal with lunch (brunch). Then you can have a snack, such as a piece of fruit, for afternoon tea to tide you over to dinnertime. You should base your meal patterns in the morning on your hunger and routine rather than on tradition. Eating something to stop you from feeling hungry later won’t usually work.

Lunch

Lunch should, for most people be an uncomplicated and predictable routine (like breakfast). At work you need strategies to deal with predictable and repeated difficult situations such as cafeterias, lunch trolleys, vending machines and other ‘fast foods’. The portion sizes will be hopelessly inappropriate for you, and you will need to either bring food with you (diet drinks and soups are very good for this), plan what to buy before you look at the menu, or be prepared to throw out the some of the food (for example, you should have only half a deli sandwich, or less if it is large). If you do not finish what you order, throw it out or you will end up grazing on it later.

Snacks

Morning and afternoon tea are other significant sources of empty calories. If you find yourself unable to resist snacking at this time, you should plan for it and bring an apple. A fundamental lesson about snack foods that you should learn early is that you will most likely eat every scrap of it if it is put in front of you and you are bored. You should treat these foods as though they were subject to smoking laws, that is, sometimes people have them but they don’t get consumed inside the house. Snack foods are potentially as dangerous to children as cigarettes, so they will also benefit from being shielded from them. Try not to have them in the house.

Dinner

For most of us, dinner is the most important meal of the day. Your other meals should be controlled, boring, and basically designed to keep you healthy but losing weight. At dinnertime you will be sitting down with your family or out with friends, and you should not miss out on the important social and relationship aspects of eating. Your family will be watching what you eat and how you eat it. If you are trying to make up for excess consumption during the day by munching on a celery stick they will not be impressed. It is important that you are able to eat some of the same things that others are eating, otherwise the extra effort required to produce a separatespecial meal for yourself will eventually become unmanageable. One way to make this meal work is to serve yourself food on a bread-and-butter plate, allowing only a tablespoon or so of each portion and leaving space on the plate between each item. Serve fruit for dessert if you cannot break the habit of having something afterwards.

Supper

The after-dinner desire to graze is a tough thing to beat. Often boredom rather than hunger is involved. Try going for a walk or reading a book rather than watching TV or sitting at the computer. People with night-eating disorder eat in response to the stimulation offered by devices like the TV or computer and will struggle with their weight unless they learn to turn them off earlier in the evening.

Alcohol

Alcoholic beverages are very high in calories. If you drink more than a couple of drinks you will completely negate any good work done during the day. Alcohol is an appetite stimulant and drinking will disinhibit you and make you more likely to eat high-calorie snacks, so a ‘big night’ once a week or a couple of nights having a couple of drinks will probably stop you losing any weight at all. Try having a large diet drink or soda water before any alcoholic drinks at home or at social events and this will stop you from drinking alcohol quickly because you feel thirsty. If you drink more than a couple of alcoholic drinks more than a couple of times a week, its unlikely that you will lose as much weight as you wish too.

Food choice

The bypass will suppress your hunger, and slow you down, but it won't force you not to eat. Any operation that forces you to stop eating (such as jaw wiring) will fail, as it will not allow you to live and function as a normal person.

It is important to try to control the times that you eat, the speed at which you eat and the types of food.

Drinks at mealtime

You should drink before rather than after you eat. Drinking after food will wash the food through and allow you to eat faster than you should. The faster and longer you eat, the more you will consume with the risk of defeating your surgery. Drinking before you eat will suppress your hunger and make it easier to swallow lumpier things.

Timing

Our modern eating habits do not work well with a sleeve. You will soon find that you have difficulty eating 'on the run' for a while. Eating and drinking while walking, talking or driving need to become a thing of the past. This has three potential benefits:

1. It limits spontaneous or 'empty' eating between meals.
2. It encourages planning of meal size and composition.
3. It encourages you to take part in the important ritual of sitting down and having a meal.

As you will often have a reasonable routine during the day you should plan your eating in a predictable way rather than just letting it happen.

Speed

You will find that the speed of your eating slows dramatically. You should use this slow pace to help you savour your food rather than aiming to eat large portions. Because it takes a longer time to eat, you can use a 'stopwatch' method for choosing how much to eat rather than finishing everything on the plate. Once 20 minutes have passed or others at the table have stopped eating, you could use this as a cue to stop yourself. Do not save the rest of the food for later.

Food types

This is not a diet. You do not need to eat special foods, although many people substitute some meals with diet drinks or something similar for convenience.

You should plan to gradually vary the foods you buy and prepare at home, but there is no reason to move away from normal food. As your stomach recovers from surgery (over two years), you will find that eating some foods will become less difficult and you will need to pay attention to avoid overeating.

Some suggestions:

- Substitute wholegrain toast or rice cakes/dry crackers for white bread.
- Use herbs and spices for flavour and oil spray rather than butter.
- Avoid cream or butter sauces, and use tomato sauces or other alternatives.
- Fish is often easier to prepare for meals than some red meats, although casseroles, mince and rissoles are usually fine.
- Lamb cutlets are also a reasonable meat choice if cooked lightly.
- Fruit may need to be peeled for a while, and some fibrous fresh foods may lose their appeal.

Sometimes having to plan your food is inconvenient, and if you don't have time to deal with this on a regular basis, you will have to avoid the trap of eating pre-prepared or fast foods, as they normally have two to three times the calories and salt than something made at home. Obvious exceptions to this are Weight Watchers™ or other slimmers' meals that you can purchase to have available when food preparation is too onerous.

Diet and food intake

It is recommended that you eat small quantities of food at least four to five times a day for the first fourtosix weeks after the operation. After six weeks, patients should aim to eat three small meals a day, usually 25 per cent of previous serves. You will be given advice about a fluid then soft diet to have until your stomach heals enough to eat solid food safely. Snacking and eating between meals will often not stop people from losing weight early on, but it always leads to weight regain later. Now is a good time to make a habit of avoiding milky coffess, snacks or anything containing calories between meals.

When going to a restaurant you can eat an entréesized meal and feel satisfied. Sweets and fatty foods are poorly tolerated and best avoided. If you do eventually learn how to tolerate these foods, you will put yourself at risk of weight gain.

The protein you will need in your diet can be found in foods like eggs, chicken, fish, meat and cheese. Protein supplements can be purchased cheaply if it's hard for you to get protein into your diet.

Carbohydrates are found in foods like rice, bread, pasta, macaroni and spaghetti. Weight loss patients should try to limit their carbohydrate intake.

What can I eat?
Most patients can eat anything after surgery, just remember to chew, chew, chew. Some patients cannot tolerate certain foods they ate before the operation. Each individual is different. If you try something and it does not agree with you, leave it and try again a couple of weeks later. It is recommended that patients stay on puréed foods for the first four to six weeks. Fresh vegetables, fruits and meats should be avoided during the first six weeks.

What if I eat too much?
You will vomit. This will also happen if you eat too quickly, or swallow poorly chewed foods. Worse than this however, is that if you practise overeating you will get good at it and eventually regain weight. Part of your recovery after surgery is learning what is enough for you. 'Enough' keeps you healthy and active; too much food will lead to weight regain. Probably fewer than one in 100 patients will lose too much weight.

Certain foods can cause diarrhoea, and 10–20 per cent of patients will develop intolerance to lactose (milk sugar).

Vitamins

Multivitamins (with folate and thiamine) are needed every day. Some people need iron, calcium and vitamin B12 as well, so blood tests for all of these should be taken on an ongoing basis.

You can purchase your vitamins from any supplier. Just make sure they are the same types of vitamins and the same quantity as recommended.

Some patients who stop taking these supplements will become unwell, especially if their diet is poor and they are vomiting. If untreated these vitamin deficiency illnesses can lead to permanent dementia, neurological injury, skin changes and other metabolic abnormalities. These are difficult to diagnose and may take time to correct. **Some vitamin deficiencies can lead to irreversible damage.** Vitamin supplements should be taken life-long after this operation.

Smoking and drinking

An occasional alcoholic drink is OK, although patients who drink regularly post-op will run into problems with ulcers, weight gain and an increased risk of alcoholism. Alcohol is absorbed faster into the bloodstream after the operation, so there are risks if you drink and drive.

Those who continue smoking after a sleeve gastrectomy will be at increased risk of reflux.

Sex and pregnancy

You can still conceive and have children after this surgery, barring other fertility problems. It is recommended that patients wait at least one year after the operation to get pregnant. You can have sex after surgery – usually after three weeks.

Skin sag

Whether you get skin sag or not depends on how much weight you have lost, how elastic your skin is, your age, and how long you have been overweight.

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Exercise can help prevent hanging skin after weight loss, but if you lose an excessive amount of weight, more than likely you will have some hanging skin. Fewer than one in three patients choose to have excess skin removed after weight loss surgery.

Managing your weight loss

The amount of weight loss varies, depending on your before-surgery weight, after-surgery choice of food and level of activity after surgery. Most patients lose one-third of their original weight within two years, or 50–70 per cent of their excess weight. It is very unusual for patients to get to “goal” or 25 BMI weight, so fixating on a particular weight can lead some patients to become disappointed even when they have had a great result. We want people to aim to be “normal”, not skinny.

The operation is a tool to control your weight. If you do not use this tool correctly, you will regain some of the weight, and could regain all of it if bad dietary habits persist for long enough. Snack food is probably the greatest risk, and the best advice for patients is to have none in the house.

While the rapid weight loss you will experience is not usually dangerous, you should take vitamin supplements during the period of weight loss and thereafter. Blood tests are carried out periodically to monitor blood chemistries and nutritional status. Pregnancy is best avoided during this period. Some patients develop gallstones during this stage.

After surgery, patients experience periods when they do not lose weight. These are called weight loss plateaus. These can last from a few weeks to a few months. Patients have had plateaus for up to six months before resuming further weight loss. During these plateaus, patients will notice changes in various body dimensions (such as loss of clothing size despite stable weight).

While everybody loses weight after this surgery, approximately 10–15 per cent of patients have not lost enough weight (less than 50 per cent of their excess weight).

To avoid weight regain after your weight has stabilised, you must follow a correct diet that is high in proteins and low in carbohydrates. Avoid nibbling on chips or sweets, maintain your exercise and take your vitamins. Basically, you have to do what all people do to control their weight.

Notes and questions