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Gastric Bypass Surgery for Weight Loss

Laparoscopic Banded Gastric Bypass (LBGBP)
One-Anastomosis, Mini or Omega Loop Gastric Bypass (OAGBP)
Loop Duodenal Switch (Loop DS) or SIPS, SADI

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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 Gary Yee



Dr Jason Maani



Dr Jennifer Matthei

Essential information about this booklet

This booklet is intended to explain Gastric Bypass procedures 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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Gastric bypass surgery

Laparoscopic banded gastric bypass (LBGBP) is a procedure for the treatment of obesity. It consists of a thumb-sized vertical gastric pouch attached to the small bowel, to bypass more than 95 per cent of the stomach. The stomach that is bypassed remains attached to the neighbouring organs and its acid and fluid secretions are significantly decreased. It doesn't have a function, but remains in case a reversal is necessary or for supplemental feeding.

The stomachs' main functions are food storage, creation of hunger signals and addition of acid to food. The stomach doesn't absorb any particular foods or nutrients so people without a stomach or with a bypassed stomach will not generally become malnourished unless they eat a poor quality or insufficient diet. Acid in food does improve absorption of vitamin B12, Iron and Calcium so these elements need to be monitored after surgery.

Digestion and absorption of food and nutrients occurs in the small bowel. Most people have 5-7 metres of small bowel so the 50 cm that gets bypassed while creating a standard gastric bypass will have no effect on absorption. It has become common belief that gastric bypasses make people lose weight because of malabsorption but this is clearly incorrect. Gastric bypass works for weight loss because people eat less food after the surgery.

Gastric bypass has been described as the 'gold standard' weight control operation, and has been the most frequently performed bariatric (obesity) procedure worldwide. It is the operation to which all other procedures are compared, and it has the best – and best known – long-term results.

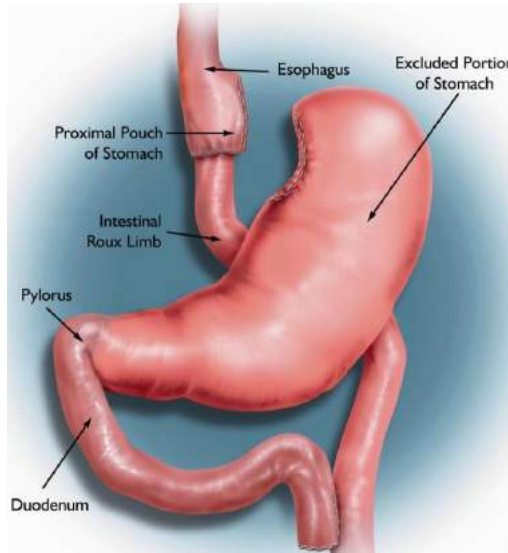
The operation is popular because:

- it produces massive and appropriate weight loss in most patients. Median weight loss at 12-18 months is 60–70 per cent excess weight or around 25-50% of total weight, with consequent loss (or cure) of complications of obesity such as diabetes, lipid abnormalities, sleep apnoea, etc.
- it can be done at an acceptable mortality rate (about 0.01 per cent). Morbidity (significant post-operative illness) is low, and post-operative side effects and nutritional deficiencies are only rarely severe. Because the stomach is bypassed, vitamin B12 and iron supplements are required. Calcium may also be required because of the duodenal bypass and reduced amounts of post-operative food eaten.
- worldwide, there exists more than 25 years of experience with the operation, showing weight loss maintenance of approximately 50 per cent of excess weight. There is little variation in results from hospital to hospital and country to country.
- The procedure most like it, the laparoscopic sleeve gastrectomy (LSG) is more commonly performed because it is easier for surgeons to do, and has a lesser requirement for follow-up. The LSG has many mechanisms of action that make it very similar to the LGBP with similar weight loss but less side effects. The LGBP is a bit better in patients with reflux, bad diabetes and as a re-operative choice in those who have failed to achieve or maintain weight-loss with other weight loss operations. It seems to be easier to regain weight with an LSG than a LGBP.

If your body mass index (BMI) is greater than 40 or your BMI is greater than 35 with weight-related complications, then you may qualify for gastric bypass surgery. The surgery is reversible. The stomach and bowel can be reconnected, although this requires another operation. The mortality rate for gastric bypass surgery is very low (about 0.02–0.01 per cent), meaning that one in 500 to one in 1000 patients may die within the first thirty days after the operation from various causes. The most common cause is pulmonary embolism.

How does it work?

The operation is truly a **bypass of the stomach**. The stomach is bypassed so that food eaten goes into a small gastric pouch (15–30 ml) and then into a loop of small bowel (the jejunum).



Roux-en-y Gastric

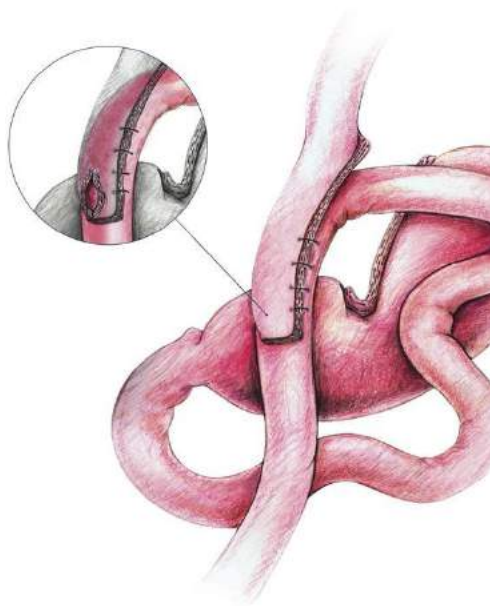
Bypass, Banded

Bypass.

Image on the left is the 'standard' gastric bypass. Image courtesy of J & J Medical.

On right is a 3D CT scan of a banded bypass stomach (70 ml sized) 8 years after surgery and a 60kg weight loss.

The 'band' or ring stops the bottom part of the stomach, anastomosis and small bowel from stretching.



Omega-loop gastric bypass

also known as single-anastomosis, one anastomosis or mini gastric bypass.

This operation has been less commonly performed but is becoming more popular as it's easier to perform than a standard bypass. It has less chance of bowel obstructions but more risk of reflux and stomach ulcers after surgery.

Figure 2. Image courtesy of Covidien Medical

Weight is lost by the following four mechanisms:

1. Satiety (being satisfied early in a meal) is induced by the small stomach pouch and through the 'switching off' of the hormones that cause hunger. Many patients go for months before they have any recognisable hunger sensations and they often have to remind themselves to eat.
2. Overeating is prevented by the new small and tight stomach. Too much food causes discomfort and vomiting. If possible, I usually put a silicone ring around the stomach, which helps prevent the stomach stretching up in the future (the **banded bypass**).
3. The operation often causes intolerance to sweets and high-density carbohydrates (fatty, oily food), as the rapid presence of sugar or large volumes of carbohydrate in the small bowel leads to unpleasant symptoms called 'dumping'.
4. There is trivial malabsorption of fat, as the food eaten is initially not mixed with bile and pancreatic juice. There is no protein or carbohydrate malabsorption.

Around 85–90 per cent of diabetics have their diabetes completely resolve, often before they leave hospital. The mechanism by which this occurs is not known, but it may be due to bypass of the duodenum and pancreas.

Staplers are used for cutting the stomach and the small bowel. However, it is not gastric stapling.

A cholecystectomy, hiatal, ventral and umbilical hernia repairs are some of the procedures that can be performed at the time of the gastric bypass operation. Additional operations increase operating time and the risks of the operation.

Typically gastric bypass surgery does not require a blood transfusion, but with any surgery there is a chance of having a transfusion if the need arises.

What is achieved by the operation?

First and foremost, the operation achieves weight loss. Significant weight loss will then have an effect on the physical and psychological consequences of obesity. These effects, however, are not as predictable as the weight loss.

The operation allows the average patient to lose 60–80 per cent of their excess weight in 12–18 months. After this period, most patients regain some weight. This weight gain occurs for a variety of reasons including poor compliance with diet and exercise and physiological adaptation of the body to the operation. **At 5, 10 and 15 years the weight loss stabilises at approximately 50–70 per cent of excess weight.** Weight regain may be preventable through dietary compliance.

Approximately 5–15 per cent of patients will not lose adequate weight with the operation (i.e. greater than 50 per cent of excess weight). These patients cannot be reliably identified pre-operation, but weight loss failure is very uncommon, apart from in the super obese (BMI greater than 50), who may nevertheless lose significant weight. More 'aggressive' surgery is possible, but can lead to severe nutritional problems in some patients. Re-operations for 'failure' can sometimes be difficult and may have variable success.

For most patients the operation will result in losing 60–80 per cent of excess weight, which means they will still be a little overweight but will have lost enough weight to bring their obesity-related risk profile back to a normal level. An operation that would reliably get the average patient to their ideal body weight would cause many people to lose too much weight.

But it is the individual him or herself that is the key to a successful outcome. The surgery will help you lose weight and help to maintain weight loss, but on its own it **will not sustain a good outcome**. Patients who snack more than once a day will only stop regaining weight when they stop snacking, especially because most snacks are carbohydrate based and lead to stimulation of hunger. Change of lifestyle – with a commitment to healthy eating with appropriate sized serves and daily exercise – is required for long-term weight control.

The co-morbidities of severe obesity can be expected to lessen and in many cases disappear with the massive weight loss. **Patients should discuss their goals for the surgery** so that realistic expectations can be set.

What is the difference between the One anastomosis gastric bypass (OAGBP) and Banded Roux-en-Y gastric bypass (LBGBP)?

There are more similarities than differences. They both function more-or-less the same way, but there are potential differences that can be important in some patients:

- 1) Both the banded bypass and the OAGBP seem to create more durable weight loss than the standard laparoscopic bypass that many surgeons perform. With the banded bypass the extra weight loss comes from maintenance of “restriction” caused by the silastic band which stops the stomach from stretching and because of the narrower gastric pouch. With the OAGBP the better weight loss is a result of the narrow gastric pouch and because of the more extensive small bowel diversion than with either the banded or standard GBP procedure.
 - a. While the OAGBP seems to give better weight loss than a banded bypass, the weight loss isn't better than the banded GBP and we don't know if it's quite as good.
- 2) The Banded GBP is harder to learn than an OAGBP, so the number of surgeons able to safely perform the procedure is less.
- 3) The OAGBP leads to more risk of iron deficiency, reflux and ulcers than a Banded GBP. Malnutrition and loose bowel motions are more common in the OAGBP because of the small bowel bypass.
- 4) The Banded GBP has a greater risk of “restrictive” side effects than the OAGBP especially during the first 18 months when people are losing weight. It also has a higher rate of small bowel blockages.
- 5) Re-operations are sometimes required for either procedures. OAGBP patients can sometimes need surgery for correction of reflux or malabsorption and Banded GBP patients sometimes need surgery to remove/loosen their band or for bowel twists.

We have performed the largest number of Banded GBP procedures in Australia and use this as our default “bypass” procedure because it has the best published weight loss results, but we are happy to offer the other procedures based on personal preference of the person having surgery. On some occasions we perform an OAGBP in patients where it seems that a Banded GBP may be too risky because of problems with access to the small bowel.

Loop duodenal switch surgery

Laparoscopic Loop duodenal switch (Loop DS) is a procedure for the treatment of obesity. It consists of a sleeve gastrectomy (LSG) stomach with re-plumbing of the small bowel to reduce the amount of bowel that you use to process nutrients from food. The “sleeved” stomach ends up being about 120-160 cc in size compared with a normal stomach which is about 1200-1400 cc in size, and this helps reduce hunger and eating capacity. Bypassing $\frac{1}{2}$ the small bowel leads to a couple of different effects:

- 1) For a while you may not absorb fats fully so if you eat a lot, you will get diarrhoea and smelly/floating poo if you eat a fatty meal.
- 2) If you eat carbohydrate rich foods, you will likely get bad diarrhoea as well. The best foods are meats, fish, eggs, greens, and low starch vegetables.
- 3) Cholesterol levels will drop, and diabetes will be reduced/resolved.
- 4) It seems likely that you will have a period of adaptation of the small bowel whereby your metabolic rate will increase for a while, making it easier to lose weight.
- 5) The risk of vitamin and mineral deficiencies is greater than a LGBP or LSG. Cases of life-threatening malnutrition have been reported with this procedure when a poor-quality diet is combined with poor vitamin intake. Some patients will get malnutrition despite being compliant if they have any abnormalities in their small bowel function.

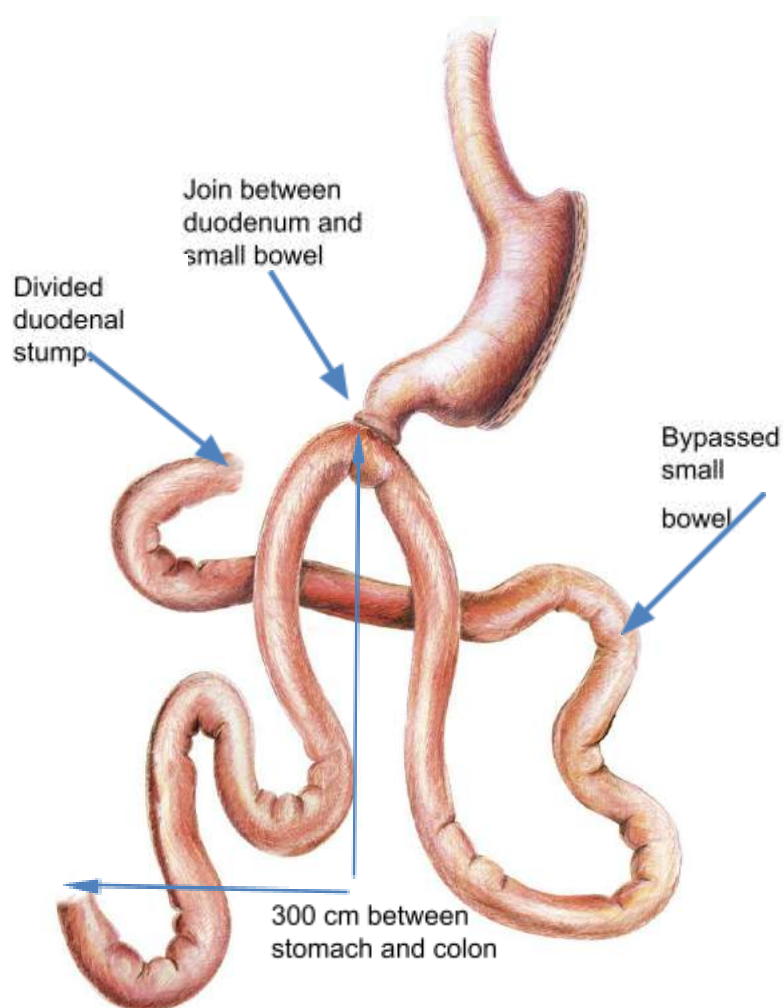
The operation is a modification of a couple of older intestinal bypass procedures, the Scopinaro operation and the classic open duodenal switch, it has been introduced as an alternative to these operations and the LSG and LGBP because:

- it produces massive and appropriate weight loss in most patients. Median weight loss at 12-18 months is 60–70 per cent excess weight or around 25-50% of total weight, with consequent loss (or cure) of complications of obesity such as diabetes, lipid abnormalities, sleep apnoea, etc.
- it can be done at an acceptable mortality rate (about 0.01 per cent). Morbidity (significant post-operative illness) is low, and post-operative side effects and nutritional deficiencies are only rarely severe. Because the stomach is small, vitamin B12 and iron supplements are required. Calcium may also be required because of the small bowel bypass and reduced amounts of post-operative food eaten. Fat soluble vitamins are usually suggested to be taken because of concerns of fat malabsorption.
- There has been a recognition that traditional intestinal bypass operations are too risky to become mainstream, so this operation has been designed to reduce the risks but maintain some of the potential benefits of small bowel bypass.
- There is recognition that some patients do not want the restriction in eating that the LGBP creates (some people wish to eat larger meals).
- Because many patients who have this procedure will not tolerate carbohydrates it may be an effective procedure for people who realise that “carbs” are their weakness. Carbohydrate preference is the commonest reason for weight regain after the LSG or LBGBP.
- As a calculated 20% or so of patients having LSG will regain their weight, this operation exists as another option for redo surgery (other than LBGBP) in patients whose weight regain after their Sleeve is significant, especially since carb eating is the likely mechanism for 90% of sleeve failures.

If your body mass index (BMI) is greater than 40 or your BMI is greater than 35 with weight-related complications, then you may qualify for Loop DS surgery. The surgery is partly reversible. The stomach and duodenum can be reconnected, although this requires another operation. The mortality rate for surgery is very low (about 0.02–0.01 per cent), meaning that one in 500 to one in 1000 patients may die within the first thirty days after the operation from various causes. The most common cause is pulmonary embolism.

How does it work?

The operation involves creation of a sleeve gastrectomy (LSG) then adding a bypass of a couple of metres of small bowel.



Loop DS.

A standard sleeve gastrectomy (LSG) is performed.

The duodenum, just past the stomach is divided.

The first couple of metres of small bowel are bypassed and the small bowel joined to the duodenum where it has been divided.

The length of small bowel between the stomach and the colon (large bowel) is 300-330 cm.

Weight is lost by the following mechanisms

- 1) Satiety (being satisfied early in a meal) is induced by the small stomach and through the 'switching off' of the hormones that cause hunger. Many patients go for months before they have any recognisable hunger sensations and they often have to remind themselves to eat.
- 2) Overeating is prevented by the small stomach. Too much food causes discomfort and a feeling that food has got stuck.
- 3) The operation often causes intolerance to carbohydrates, as the shortened small bowel can't digest all the carbohydrates and they end up in the colon. Undigested carbohydrates in the colon activate gas forming bacteria that lead to diarrhoea and wind. Protein is absorbed normally.
- 4) There is likely some malabsorption of fat for a while. If fat gets into the colon it works as a lubricant that make motions too runny to hold on to easily.

Around 85–90 per cent of diabetics have their diabetes completely resolve, often before they leave hospital. The mechanism by which this occurs is not known, but it may be due to bypass of the duodenum and pancreas.

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A cholecystectomy, hiatal, ventral and umbilical hernia repairs are some of the procedures that can be performed at the time of the gastric bypass operation. Additional operations increase operating time and the risks of the operation.

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The operation allows the average patient to lose 60–80 per cent of their excess weight in 12–18 months. After this period, most patients regain some weight. This weight gain occurs for a variety of reasons including poor compliance with diet and exercise and physiological adaptation of the body to the operation. **At 5, 10 and 15 years the weight loss stabilises at approximately 50–70 per cent of excess weight.** Weight regain may be preventable through dietary compliance.

Approximately 5–15 per cent of patients will not lose adequate weight with the operation (i.e. greater than 50 per cent of excess weight). These patients cannot be reliably identified pre-operation, but weight loss failure is very uncommon, apart from in the super obese (BMI greater than 50), who may nevertheless lose significant weight. More 'aggressive' surgery is possible, but can lead to severe nutritional problems in some patients. Re-operations for 'failure' can sometimes be difficult and may have variable success.

For most patients the operation will result in losing 60–80 per cent of excess weight, which means they will still be a little overweight but will have lost enough weight to bring their obesity-related risk profile back to a normal level. An operation that would reliably get the average patient to their ideal body weight would cause many people to lose too much weight.

But it is the individual him or herself that is the key to a successful outcome. The surgery will help you lose weight and help to maintain weight loss, but on its own it **will not sustain a good outcome**. Patients who snack more than once a day will only stop regaining weight when they stop snacking. Change of lifestyle – with a commitment to healthy eating with appropriate sized serves and daily exercise – is required for long-term weight control.

The co-morbidities of severe obesity can be expected to lessen and in many cases disappear with the massive weight loss. **Patients should discuss their goals for the surgery** so that realistic expectations can be set.

Before Surgery

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 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.

During and immediately after surgery

An uncomplicated bypass takes from 1.5 to 2.5 hours. You will be able to shower a day after the operation.

You may feel some pain, although many patients say it is not a painful experience. It's different for everybody. In fact, for most patients, tiredness for the first 4–6 weeks is a far more significant problem than pain.

If patients do get abdominal pain at any time after surgery you need to be seen by someone familiar with your surgery to check that you don't have a bowel twist or obstruction. This can occur in up to five per cent of patients after bypass surgery and can occur many years later. Bowel twists can almost always be easily fixed if patients are looked after appropriately.

Scarring

Most people have keyhole surgery that involves making five-6 small incisions 5 mm to 12 mm long. If an 'open' operation is needed the cut will run from just below the breast bone to just above the belly button. The likelihood of needing 'open' surgery depends on whether you have had significant abdominal surgery before, but is generally required for fewer than one per cent of patients.

To reduce the appearance of the scars, leave the skin tapes on your incision for as long as possible. Some patients have used vitamin E cream to help the scar heal better. Scar-gel or special silicone sheets can be purchased from chemists that can help reduce red 'lumpy' scarring.

Keyhole surgery patients will have dissolving sutures. You can remove the dressings after seven days.

Follow-up appointments

Usually patients are scheduled for a follow-up visit 7–14 days after discharge from the hospital, then again at six weeks, three months, six months, one year, then yearly after that. You can make appointments to be seen more frequently if needed.

Post-surgery recovery

For six weeks after the operation, you should undertake no strenuous activities. Most office and routine work can be resumed in two weeks. If you have a non-strenuous job, you can go back to work in two to three weeks with the approval of your surgeon. If not, you need to be off work for about six weeks. Most patients recover completely in six to eight weeks. You cannot lift anything heavier than 10 kg for three weeks, then gradually increase to normal activity by six weeks.

Subsequent operations

Second operations may sometimes be necessary because of complications, but not usually. The most common second operation is reconstruction of the abdominal wall (abdominoplasty) or an operation for gallstones. Five per cent of patients need a gastroscopy in the first few months after surgery to help with swallowing problems.

About one to three per cent of patients each year will need revision operations. Revision operations are due to outlet problems, fistulas, too much weight loss and not enough weight loss.

What will be different after my bypass?

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 bypass, 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 thing. If you or others believe that you 'must' eat more food 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 less. If someone maintaining their weight is having approximately 1000 calories a day, then to lose weight you 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 other way 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 do not feel like breakfast after surgery. 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 some of the food (you should have 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 separate, special 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, you should not have a bypass, as you run the risk of alcohol addiction being promoted by your bypass because of rapid absorption of alcohol.

Smoking

With BLGBP and OAGBP smoking creates significant and lifetime risks of dangerous gastric ulceration that is highly likely to lead to stomach perforation and/or bleeding. Patients who smoke should not have these operations, or if they do they need to stay on life-long ulcer prevention medications. This is not such a problem with the Loop DS but with all of these procedures smoking creates a risk of weight gain because people who smoke become addicted to putting things in their mouth when they are bored or stressed. Smoking increases your risk of severe infections by 2-3x.

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 that 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 leading to 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 bypass. You will soon find that you have difficulty eating 'on the run'. 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.
- 5) 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 therefore 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 for 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 six weeks** after the operation. After six weeks, patients should get used to eating three small meals a day, usually 25 per cent of previous serves.

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 light 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 bypass 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 pureed and then soft 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 feel uncomfortable, either because food gets stuck or you 'dump'. 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).

Acid or bile

In the bypass operation, the stomach and the area where the bile empties to the bowel is bypassed. You will probably have the dry heaves when you vomit. **If you vomit bile (which is green or dark yellow) it is a bad sign and you should let your surgeon know.**

Vitamins

Multivitamins (with folate and thiamine) and an injection of Vitamin B12 every 3-6 months need to be taken by all. Menstruating women need to take iron tablets (for example, take an iron tablet for as many days as you have a period every month) because your intake is much less compared to the regular stomach and because parts of the stomach and small bowel that are important for absorbing some of the vitamins have been bypassed. Some patients will also need calcium and vitamin D (as will some pre-menopausal women and some men).

You can purchase your vitamins from any supplier. Just make sure they are the same types of vitamins and the same quantity as recommended. Most patients can swallow pills whole. Chewable vitamins are easiest for the first few months after surgery.

Patients who stop taking these supplements will likely become unwell, and some 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 bypass will eventually develop complications such as stomach ulcers. Patients who do not think they can stop smoking should consider alternate operations, it does seem as though a Loop DS has advantages in smokers because of a lower ulcer risk.

Sex and pregnancy

You can still conceive and have children after this surgery, barring other fertility problems. It is recommended that patients with a bypass 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.

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 60–80 per cent of their excess weight.

The bypass operation is a tool to control your weight. If you do not use it correctly, you will regain some of the weight. 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 be taking 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 two or three 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 bypass surgery, approximately 10 per cent of patients have not lost enough weight (less than 50 per cent of their excess weight). Follow up is critically important in patients who are falling short of their goals as there are plenty of options we can use to help get things back on track.

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.

What are the possible complications?

Possible complications after bypass surgery include pre-operative, intra-operative, post-operative and late complications.

Pre-operative complications include but are not limited to:

- anxiety attacks
- mood swings
- intolerance to the pre-operative very low-calorie diet
- allergic reactions to pre-operative medications
- problems with anaesthesia.

Intra-operative complications could include but are not limited to:

- bleeding
- injuries to various intra-abdominal structures or organs
- hypotension
- hypertension
- cardiac arrhythmia
- cardiac arrest
- aspiration
- death.

Post-operative complications could include but are not limited to:

- bleeding infections
- leaks
- lung collapse
- pneumonia
- thrombophlebitis
- blood clots to the lungs
- nausea
- vomiting
- watery stools
- difficulties breathing without a respirator
- back pain
- numbness
- difficulties passing urine
- gastric outlet obstruction
- bowel obstruction.

Long-term related complications could include but are not limited to:

- hair loss or hair thinning
- depression
- gastric outlet stenosis
- gastrogastic fistula
- various forms of bowel obstruction
- ventral hernias
- cholelithiasis
- anorexia with excessive weight loss
- inadequate weight loss
- fat-soluble vitamin A, D and E deficiencies
- calcium, iron, B12, thiamine and folic acid deficiencies
- hypoglycaemia
- osteoporosis
- anaemia.

Nutrient deficiencies can either be prevented or corrected. Vitamin supplementation has to be taken permanently.

Dumping

Fatty and sugary foods will cause 'dumping' due to the rapid presence of high osmolarity fluid in the small bowel.

Dumping is when, after eating or drinking, you hear or feel your heart pounding, you feel clammy, you are sweaty, or shaky. You may also feel the urge to use the bathroom. Any combination of these symptoms can occur either mildly or severely depending on what you ate. Some patients experience it after too much sugar intake and others after too much fat or greasy food intake. Try to avoid sweets.

If you experience dumping, sit or lie down. It normally goes away in less than thirty minutes. Make a note of what you just ate or drank. After several episodes of dumping you will be able to tell what foods or drinks to avoid. This reflex will help you avoid sweets and fatty foods in the future.

To prevent dumping, avoid foods with high sugar and fat content. Food should be eaten dry and not mixed with fluids. Otherwise, apart from a commitment to healthy eating, no other foods are specifically banned after the operation. **Snacking – especially with junk foods – is to be avoided**, as it will greatly negate the effects of the surgery.

It is not recommended that you eat and drink at the same time, as this results in dumping because you are 'pushing' food through your system, which may lead to you eat too much. If you are hungry and thirsty at the same time, you should drink first.

Hypoglycaemia (late dumping)

Hypoglycaemia (dizziness, shaking, reduced level of consciousness) most commonly occurs because patients skip meals and/or have too much carbohydrate. Most attacks occur in the early afternoon. You should carry a protein snack if you miss a meal in order to prevent an attack. Patients should not drive if they skip meals and are prone to 'hypos'. If patients suffer recurrent hypoglycaemia (2–3 per cent) then medications and, rarely, a reversal needs to be considered.

Constipation.

This is the commonest gut side effect. Many patients need a stool softener (lactulose, Movicol or similar) for a few days until they are on a normal diet and then a bulking agent (Benefibre, Metamucil, Normacol) afterwards. You need to open your bowels at least every 2 days or abdominal cramps and discomfort are pretty much guaranteed.

Diarrhoea

Loose bowel motions are not a problem for most patients. While your new stomach will empty a lot faster than a normal stomach, the small bowel can usually cope with the increased speed of emptying unless the foods you eat contain substances that you don't absorb well. Because of this all these operations can create loose bowel motions in some patients, but the reason will vary for person to person. Common examples include:

- 1) Lactose intolerance. If your small bowel lacks the enzyme to digest lactose (the sugar in milk) then this sugar will act like a lubricant keeping your motions more liquid, and the sugars will be digested by bacteria in the colon which will then lead to creation of excess gas.
- 2) Fruit sugar intolerance. Similar to lactose intolerance, if your small bowel can't digest these sugars then eating fruit can cause bloating, gas and diarrhoea similar to what happens in patients with lactose intolerance.
- 3) FODMAP intolerance. (FODMAP = Fermentable Oligo-, Di, Mono-saccharides and Polyols). This is like lactose and fruit sugar intolerance but worse. FODMAP sources include wheat, garlic, onion, fruit, asparagus, Brussel sprouts, mushrooms, legumes (beans/lentils), artificial sweeteners, some grains, fruit juices and dairy. The banded bypass may be the better procedure for patients with FODMAP intolerance while the Loop DS is highly likely to make these symptoms worse.
- 4) Other carbohydrates. People who have a Loop DS may get loose bowels if they eat more than a small amount of carbohydrate, unfortunately it may not happen to everyone who has had this procedure. Carbohydrate reduction is important in all patients want to lose weight and keep it off.

Hair loss

Hair loss is common. Hair is a product of protein breakdown. Any time you experience rapid weight loss, you can experience hair loss. However, hair loss is a temporary problem and some patients don't experience it at all. It usually occurs during the period of rapid weight loss between the third and the eleventh month after the operation before returning to normal.

Protein and zinc/silica supplements can help prevent or minimise hair loss.

Depression

Having surgery denies patients the ability to eat freely, which can be very stressful. Some medications for depression and other conditions need to be increased or decreased after surgery. Some people have unrealistic expectations of the outcome of the operation. Some may have trouble coping with the significant weight loss. Occasionally patients will need psychiatric consultations. Losing a significant amount of weight changes how people see themselves and their relationships with others. Marital problems can occur after surgery. Some patients may move from a food addiction to an alcohol or drug addiction.

Intentional self-harm (suicide attempts) are slightly more common after weight loss surgery, this may be due to cessation of anti-depressant medications, drug and alcohol or interpersonal relationship problems.

