The Sleeve Gastrectomy

Information for Patients

Central Region Metabolic and Bariatric Service

Capital & Coast
District Health Board
ŪPOKO KI TE URU HAUORA

Contents

Background

Adult morbid or severe obesity has been recognised as a worldwide pandemic with 1.1 billion people worldwide being overweight. Severe obesity is a chronic, debilitating incurable illness. In New Zealand we have an environment that supports obesity with ready access to poor nutrition in combination with reduced physical activity. Table 1 illustrates the World Health Organisation (WHO) definitions of weight and obesity as defined by the Body Mass Index (BMI) as this is the most widely recognised accepted measure (where BMI is the individuals' weight in kilograms divided by the height in meters squared).

Classification	BMI
Underweight	<19
Ideal BMI	19-25
Overweight	25-30
Obese	>30
Severely Obese	>35
Morbidly Obese	>40
Super Obese	>50

Table 1: WHO classification of weight by BMI

Why do we worry about obesity?

Obesity is associated with increased risk of morbidity and mortality. This means that morbidly obese people may live a shorter life and are at risk from a number of medical problems. The higher the BMI the higher the risk to the person. Even moderate weight loss of 5 to 10% has been shown to produce measurable improved health outcomes.

We know the following will be improved by weight loss:

- Diabetes mellitus (type II)
- High blood pressure
- Dyslipidaemia (problems with fats like cholesterol in the blood)
- Obstructive sleep apnoea
- Venous and lymphatic stasis
- Osteoarthritis
- Decreased mobility
- Increased risk of heart disease and stroke
- Hypertrophic cardiomyopathy
- Urinary stress incontinence

Rates of obesity in New Zealand are comparable to other western countries; however the prevalence of severe obesity is higher in Maori and Pacific populations than in other ethnic groups.

The cost of morbidity, mortality and social stigmata in this group is high and is escalating in our society. So, what can be done? We can focus on education, healthy eating and lifestyle strategies. However dietary treatment, lifestyle, medication and behavioural therapies can sometimes result in short term weight loss but there is a failure rate of 20-45%. People who are able to continue their interventions can maintain a weight loss between 1.1 to 6.5 kg over 2 years. To the individual with severe obesity and a weight of over 150 kg, that degree of weight loss is negligible and irrelevant. Dieting, medication and intensive exercise for weight loss are therefore lifelong and probably unachievable battles in the severely obese.

Why is it difficult to lose weight?

Society tends to attribute too much of obesity to laziness and gluttony whereas we should consider it as a disease process. It is not a defect in the personality or character of the patient. Obesity's increasing prevalence is probably due to an obesity supportive environment with behavioural and biological influences. At the extreme end of the scale, the morbidly obese, are thought to have a significant genetic component to their disorder. Both the brain and gut work in together to prevent conventional attempts to lose weight. Weight regulation is controlled centrally by certain parts of the brain (hypothalamus and brain stem); weight loss provokes a compensatory response from gut hormones (eg. ghrelin) to increase the appetite. Internal mechanisms therefore cause the body to grudgingly lose weight and when large amounts of weight is lost, post-starvation hunger and overeating occurs with resultant disproportionate fat gain. This is why medical treatment programmes fail 95% to 97% of the time (National Institutes of Health Study 1992).

What can be done?

The National Institute of Health in the United States issued guidelines for the treatment of obesity in 2000. First line treatment consisted of dietary, exercise and behavioural modification with small resultant weight loss. Second line treatment is offered by drugs such as reductil and xenical. These should precede surgery; however surgery offers the only method of sustained weight loss.

Who should receive surgical treatment have been defined by many groups and government agencies worldwide but essentially it is those with a BMI in excess of 40 kg/m^2 or 35 kg/m^2 with associated co-morbidity eg. diabetes or blood pressure. These patients should also be fit for anaesthesia

and surgery and have attempted other methods of weight loss. We believe that surgery should be offered within the context of a multidisciplinary team and assessment. The patient should be willing to undergo long term follow up after surgery.

Surgery:

Bariatric surgery is the technical term for the surgery used for weight reduction in people with severe obesity. An individual is considered to have severe (morbid) obesity if they have a body mass index (BMI) equal to or greater than 35 kg/m2 in the presence of significant co-morbid conditions that could be improved by weight loss.

It should be realized obesity surgery is not cosmetic surgery.

Two broad types of surgery are described as restrictive and malabsorptive and these are performed both open and laparoscopically. The first method restricts the volume of food that can be held in the stomach. The second group is the malabsorptive procedures and the food that is eaten can not be properly absorbed because the gut is effectively shortened. Procedures such as gastric bypass have an element of both of these types.

The type of surgery offered will be determined by local expertise and experience. Outcomes are variable between procedures; these are illustrated in Table 2 in terms of initial mean percentage excess weight lost. This assumes a normal weight for that height from life expectancy tables and the weight loss is measured as a percentage. Undoubtedly the more extensive procedures produce higher weight loss but in doing so there is a significant compromise to life style, therefore there is much disagreement over what is the ideal procedure.

Procedure	Results *(mean excess weight loss of initial excess weight)*
Vertical banded gastroplasty	58% at 5 years
Gastric banding	55% at 6 years
Sleeve gastrectomy	66% at 3 years
Gastric bypass	68% at 5 years
FOBI pouch gastric bypass	75% at 5 years
Biliopancreatic diversion	77% at 8 years
Biliopancreatic diversion with duodenal switch	70% at 8 years

Table 2: Published results of Bariatric procedures.

Who should not have surgery?

Any operation is just one step towards weight control. It is vital to make changes in your lifestyle and diet to make the most of any operation. If these aims are only short term, then satisfactory weight loss will not be achieved. If you have a desire to eat whatever you like this is clearly not compatible with surgery.

To be a candidate for surgery you should have a BMI of at least 35 Kg/m² with a co-morbid condition as listed.

Our bariatric progam using sleeve gastrectomy:

This booklet is to help guide you through the surgery you are considering. Following sleeve gastrectomy you will lose weight; quite how successful this will be is determined by you. Set yourself a realistic goal and combine the surgery and lifestyle support to attain your goals.

Our bariatric program has been carefully developed and involves a multi-disciplinary approach.

You should read this booklet before surgery and ask any questions of the team you feel necessary.

The multi-disciplinary team consists of **Surgeons, Anaesthetist, Dietitian, Counsellor/Therapist and Nurses.**

Step 1: Preoperative Evaluation

- Multidisciplinary assessment
- Surgeon
- Counsellor/Therapist
- Dietitian
- Anaesthetist
- Weight loss plan before surgery

Step 2: Sleeve gastrectomy

- How it works
- During your hospital stay
- At home
- Common symptoms

Step 3: Lifestyle Changes after surgery

- Diet after surgery
- Multivitamins
- Exercise
- Long term weight maintenance
- Counselling

Follow up plan and some basic rules

Preoperative evaluation

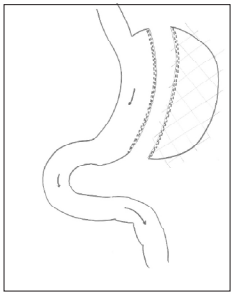
The preoperative evaluation is a multidisciplinary assessment of you and your suitability for bariatric surgery. It is vital to remember that this assessment is in your best interest and designed to identify any potential troubles and optimise the outcome of your surgery. It is possible that following this assessment you will be declined surgery. The process involves you being assessed by each and everyone of the team which includes the surgeon, counsellor/therapist, dietitian and anaesthetist.

Surgeon:

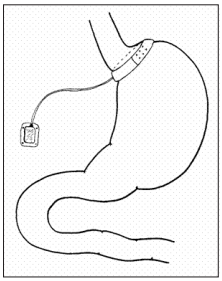
The surgeon will discuss the issues related to obesity and talk in depth about the various surgical options that are available so that you are fully informed and can make an educated decision.

Laparoscopic sleeve gastrectomy:

Sleeve gastrectomy is a restrictive weight loss operation. This is normally performed keyhole (laparoscopically) and reduces the stomach in size and volume. The outer part of the stomach is removed to create a long narrow tube; the volume of the stomach is reduced from in the region of 2 litres to about 100 mls. As this is normally performed keyhole, hospital stay is only a few days.

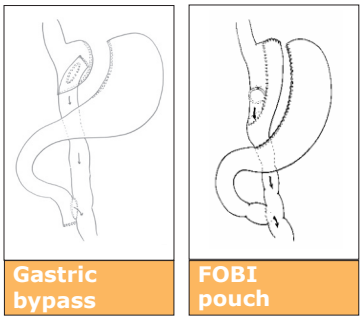


Laparoscopic gastric banding (Lap band):



More than 200,000 gastric bands have been inserted worldwide. This consists of a collar of silicon containing a bladder which may be inflated. This isplaced just below the junction of the stomach and oesophagus. The band may be adjusted through a port placed under the skin on abdominal wall muscle. The weight loss and lifestyle results of the gastric band are dependant on the patient following a strict dietary plan post-operatively. The older restrictive operation of vertical banded gastroplasty (VBG) has fallen away in surgical practice because of unacceptable results.

Gastric Bypass/Roux-en-Y Gastric Bypass/FOBI pouch gastric bypass (RYGB):



Gastric bypass is especially popular in the United States as it is believed to have good long term outcomes compared to pure restrictive techniques and does not suffer from the heavy commercial marketing of Lap band. The surgery involves creation of a small gastric pouch by division of the stomach. A loop of small bowel is brought up and joined to the gastric pouch; this is of variable length. For a FOBI pouch a silastic ring is placed around the gastric pouch as an additional measure.

Biliopancreatic Diversion (BPD)/ Biliopancreatic Diversion with a Duodenal Switch (BPD with DS):

Biliopancreatic diversion is similar to a gastric bypass in principle. A larger gastric pouch/reservoir is created, but the

remaining stomach is usually removed. The two parts of the bowel are rejoined leaving a very short common channel for reabsorption of food. For Biliopancreatic diversion with a duodenal switch a sleeve gastrectomy is constructed; the duodenum is divided and the small bowel divided. The small bowel is joined to the divided stomach and the end of the divided duodenum is rejoined to the terminal ileum. With both these procedures malnutrition is a real long term complication of the procedure.

Counsellor/Therapist

Prior to surgery our counsellor will meet with you on an individual basis for two sessions, each of 60 minutes duration. This is a time to empower you by discussing and heightening your awareness of your general life long patterns. This is important before surgery as it can help identify issues that may arise for you after surgery.

Dietitian

The **dietitian** has a nutritional plan that will fit in with your life. Prior to surgery it is essential that you go on an Optifast diet. Weight loss prior to surgery is an essential step. Weight loss before surgery is known to reduce the size of your liver and decrease the fat in the abdomen. This makes the keyhole operation technically more straightforward and therefore safer. **Any weight loss achieved is positive and a step in the right direction.**

Optifast ® VLCD Plan before Obesity Surgery

Optifast VLCD is a nutritionally complete Very Low Calorie Diet designed for the management of obesity. The diet has been prescribed for you and if it is followed it will make the surgery more straightforward. The dietary plan is mandatory and needs to be followed closely and is initially **used for at least 2 weeks prior to surgery.** Optifast ® VLCD **totally**

replaces your normal diet. Instead of your meals you need to take 3 sachets of any of the Optifast products daily.

Product options: Milkshakes (Chocolate, vanilla, strawberry, coffee); Soups (Chicken, Mixed vegetable); Desserts (chocolate, lemon cream) and bars.

The diet consists of 800 kcal a day. It contains carbohydrates, essential fatty acids and high quality protein; this helps preserve the muscles at the expense of fat stores. **The 3 sachets replace all meals and are supplemented by 2 litres of calorie free fluids and 2 cups of low starch, green vegetables.**

Preparation: Add one sachet of Optifast ® VLCD to 200 ml of cold or warm water. Stir, shake or use a blender. A good idea is to add ice to the blender as it tastes better, but avoid using boiling water.

Fluids: Whilst on the diet you must take at least 2 litres of extra fluids a day. This can include water and diet soft drinks.

Fibre: Whilst on this product it is advisable to use a fibre supplement to prevent constipation. This can be added to the meal replacements. Suggested products are Metamucil or Normacol plus.

Diabetes: As the carbohydrate content is low in Optifast® any medication used for diabetes may have to be modified. For this reason blood sugars may have to be more closely monitored. Before starting on the diet you should consult with your GP or endocrinologist.

Other foods: Besides the Optifast® the following foods may also be eaten: low calorie jelly, strained broth; low starch vegetables or salads: 2 cups a day cooked without fat or oil or salt (see table).

Asparagus, cauliflower, celery, beans, cucumber, silver beet, beetroot, eggplant, snow peas, bok choy, lettuce, spinach, broccoli, leeks, squash, brussel sprouts, alphafa, mung beans, tomato, cabbage, mushrooms, watercress, capsicum, zucchini, carrots, onion, shallots, radish.

Avoid all FAST FOODS

Optifast ® VLCD Meal Plan		
Breakfast		
1 x Optifast milkshake	Black Tea or coffee	Water
Lunch		
1 x Optifast milkshake	1 cup of steamed vegetables Or 1-cup salad *(use Low Joule dressing)*	Low Joule jelly, Low Joule soft drink or cordial, Water, Black tea or coffee
Dinner		
1 x Optifast milkshake	1 cup of steamed vegetables Or 1-cup salad. *(use Low Joule dressing)*	Low joule jelly, Low joule soft drink or cordial, Water, Black tea or coffee
Mid Meals		
Water, Low joule soft drink or cordial, black tea or coffee		

Anaesthetist:

The anaesthetist is the specialist doctor that puts you to sleep for your surgery. Before surgery, the anaesthetist will see you and discuss your past medical problems. Further tests will be organised including chest x-ray, ECG, and blood tests. Other tests may be required such as echocardiograph and blood gases.

Laparoscopic sleeve gastrectomy

How it works:

Sleeve gastrectomy was initially conceived as the first stage of a two stage procedure in high risk surgical patients (ie. Those with very high BMI). However many patients found the weight loss very acceptable and declined further intervention. However, in those patients where weight loss is not considered sufficient it can be converted to a gastric bypass.

Sleeve gastrectomy is a restrictive weight loss operation. This is normally performed keyhole (laparoscopically) and reduces the stomach in size and volume. The outer part of the stomach is removed to create a long narrow tube; the volume of the stomach is reduced from in the region of 2 litres to about 100 mls. This is an irreversible procedure. This is normally performed laparoscopically (keyhole) with only a few days in hospital.

This reduction in stomach volume produces a number of effects. The stomach needs less food in it to feel full and satisfied. The initial effect of the surgery is to remove that part of the stomach that produces a hunger hormone (ghrelin); this leads to less hunger in the initial stages. As the stomach feels full this allows better portion control and a reduced number of calories are required in the diet. With fewer calories being eaten this inevitably results in weight loss. However, it is vital to remember that surgery is only the tool, and in order to achieve good long term results this reduction in intake must be accompanied by regular exercise and lifestyle change.

In comparison to the laparoscopic gastric band (Lap band) which is also restrictive; the patient feels full rather than the obstructive pattern of the Lap band. This means there are less food intolerances and a near normal healthy and more balanced diet can be maintained

Successful weight loss will be achieved by working with the team to ensure that healthy eating is combined with the restriction of the surgery and regular exercise. Healthy eating consists of three small meals per day of lean source protein, low starch carbohydrate, adequate fruits and vegetables and maintaining a calorific intake of less than 1500kcal per day. The sleeve gastrectomy ensures that you feel full with these lower volumes of food and takes away the stimulus of hunger.

In summary sleeve gastrectomy in comparison with the Lap band

- Has a slightly greater surgical risk than the Lap band.
- The sleeve gastrectomy achieves more rapid weight loss.
- There is no foreign body.
- There is no need for further adjustments.
- Achieves greater weight loss.

Compared to the gastric bypass the sleeve gastrectomy:

- Avoids micronutrient problems.
- Avoids stomal ulcers.
- Avoids problems of small bowel obstruction

The risks of surgery:

These are risks that are associated with any operation. There is a risk to life with this surgery which will be discussed. More specifically these are some of the recognised risks of

surgery: bleeding, splenectomy (removal of the spleen), pain, fever, thrombophlebitis, blood clots, pneumonia, atelectasis, wound problems, infection, intra-abdominal abscess, leaks, pancreatitis, ventral hernia, small bowel obstruction, vitamin and salt problems, hair loss, depression, mood swings, vomiting, diarrhoea and various neuropathies.

We take many precautions to avoid these complications. You will realise by our team approach and early mobilisation how we try to minimise these risks to you. If you smoke you should stop; this will help before and after surgery.

Operative outcomes and risks:

Obesity in itself is a risk to life and surgery comes at a potential cost. All operations require general anaesthesia. However the risk to life and the disability of obesity makes these risks acceptable.

The risks of surgery can be broken down into:

- Anaesthetic risks. Anaesthesia is very safe; patients do not die "on the table" except in unusual circumstances.
- General risks: any operation will involve cuts or incisions, which can sometimes develop infection and hernias. Other risks include the risks of any surgery in relation to body functions including chest infections, clots, urine retention and infection.
- There is a risk of bleeding and a blood transfusion may be required. Any keyhole or laparoscopic operation can be converted to an open operation. With keyhole surgery damage to other organs such as the bowel or spleen may also occur. If the operation is technically difficult the operative strategy may be changed or the operation abandoned.
- Specific risks. The risks from bariatric surgery vary on

the operation and how it is performed. These may occur early or late. In any operation where there is a join made or an organ divided there is a risk of leak. This is normally despite a standard technique and runs at about 1%. This can lead to abscess formation and can be life threatening with prolonged hospital stay. In the long term there may be excessive or inadequate weight loss and there may be problems with dehydration and vitamins. There may be inflammation of the stomach or oesophagus. With rapid weight loss there is a risk of gall stone disease requiring later removal of the gall bladder. Rarely liver disease can be exacerbated by the operation, in the long term often liver dysfunction due to fatty infiltration is improved by bariatric surgery. In sleeve gastrectomy there can be a narrowing of the stomach requiring stretching (dilatation). There is also a psychological risk from surgery.

- Mortality rates for sleeve gastrectomy are in the region of 0.5 %

Resolution of diabetes usually occurs months after surgery; it is completely resolved in up to 60% of cases. Hyperlipidaemia and hypertension are resolved in about 2/3 of cases. Sleep apnoea is resolved in a similar manner.

How will I feel after a sleeve gastrectomy?

The weight loss occurs primarily over the first 12 months. At first there is a large restrictive component but as the stomach recovers it should be possible to eat 3 small meals a day. For the first 3 weeks after surgery the diet is pureed; this is followed by a soft diet. By 6 months most people can eat about a quarter of their previous meals. This means when going out to restaurants that you should be able to eat entrée sized meals and feel satisfied. Whereas with a diet you would still feel hungry, the small meal will satisfy you because of the

restrictive size of the stomach after surgery. Some people will find that they have been using food as a form of comfort or release from tension and stress. After surgery we suggest you seek help from the counsellor if you find this a problem.

Initially there is very early fullness and usually a lack of hunger. The operation is only a tool to maintain good health there should be a focus on drinking at least 1 litre of fluid a day, 1 multivitamin per day and 60g of protein per day, regular exercise and lifestyle changes.

The degree of weight loss is variable. To achieve the best possible weight loss, it is important to make the necessary changes in your lifestyle and the team will work with to achieve this goal.

Some people discover that their relationships with others is altered after surgery. The counsellor is here to help you approach these issues.

What will happen?

Day One: The day of surgery.

You will usually be admitted on the day of surgery . You will wake up after surgery with intravenous fluids running and also a patient controlled analgesia (PCA) to help control pain. On pressing the button this will deliver a dose of pain relief through your veins.

It is important to mobilise early to help prevent risk of clot formation in your legs. You will be assisted to sit up and dangle your legs over the side of the bed. You will be given a small injection to help prevent clots. You will be able to have ice cubes to moisten your mouth.

Day Two: The day after surgery.

If necessary a contrast dye study may be undertaken in the x ray department to check your new stomach. Clear fluids will start today after the doctors have seen you. It is important that you sip slowly and stop when you feel full. By evening it is possible that free fluids are commenced by mouth. This includes soup, yoghurt, custard, milk and cordial. Again take small sips and stop when you are full.

The following precautions are taken to keep the risk of complications to you as low as possible:

- Get up and walk as much as possible – for the first few times your nurse will assist you.
- If required the use the "incentive spirometer". This device will be explained to you. It helps to keep the lungs open and stop fluid accumulating. Inhale, raising the balls, hold for a second, exhale. Do this 10 times every time you use it.
- Move your feet and calves as much as possible. You will be wearing white stockings and given small injections under the skin. This will reduce the risk of clots in your legs.

Day Three:

Continue to use the incentive spirometer (if required). Walk as much as possible. Your nurse will provide you with all your medications which can be taken by mouth although tablets need to be crushed.

This is the planned day of discharge. You should progress to a pureed diet – that is anything that can be pureed.

Remember fluids are important and should be taken between meals. It is important to eat slowly, when you feel full STOP.

After discharge, remember to take small bites, chew, chew chew (25 times) put the fork and knife or spoon down between bites.

At Home:

Be active. The sooner normal daily activity is resumed the lower the risk of complications. The aim is to walk for at least half an hour a day. The surgery provides the restriction you need to eat a healthy diet and exercise sensibly. Walking is enough exercise at present anything more vigorous could cause problems.

Remember fluids are important and should be taken between meals. When you feel full, stop eating. Meals will take between 30 minutes and 1 hour to complete.

Wound:

The incidence of wound problems with this operation is relatively low, but they can occur. If you experience problems please call us.

Medications:

At discharge you will receive prescriptions for medications to be taken after discharge:

- Omeprazole: This reduces acid secretion in the stomach. This must be taken for at least 3 months post surgery.
- Analgesia: This is pain relief medicine. Instructions will be issued.

Any medicines previously prescribed by your GP or endocrinologist should be continued until advised otherwise. Ongoing regular checks with your GP or endocrinologist will monitor if your regular medications can be stopped.

NB: All large (>5mm) pills taken for the first six weeks after surgery must be crushed. It is advisable to purchase a pill crusher.

Common Post Operative Symptoms:

Dizziness:

It is not unusual that you will feel lightheaded. This is relieved by finding somewhere to sit or lie down. It is important not to panic. The likely reason that this occurs is because you are not drinking as much as previously and this will adjust with time. If this is happening very frequently (a few times a day) you should call us. Remember to aim to drink about 1.5 litres of fluid per day.

Altered Bowel Habit:

After your surgery it would not be unusual to have watery bowel movements. With the reintroduction of solid foods this may change to a more normal bowel movement. It may be useful to be on a fibre supplement, but a high fluid intake is still necessary.

Vomiting:

A few episodes of vomiting are not unusual in the first few months after surgery. The stomach can only hold small volumes, about 100mls. Remember to chew and eat slowly taking up to 45 minutes per meal. Stop when you feel full. Vomiting may be because of not enough chewing, eating too quickly or eating the wrong food.

If the vomiting persists; please call us. If you can not hold anything down for more than 8 hours please call us. If there is vomiting on a regular basis this can also cause damage through swelling and blockage.

Nausea:

Any surgery involving the stomach can cause nausea. It may occur as early as day 3 or after 2 weeks at home. Despite the nausea you should continue to drink water and if possible keep going with 3 small meals per day. Part of this problem is the reason for the massive weight loss. This nausea is rarely associated with vomiting. If there is vomiting especially white frothy saliva that is not unusual. If you start to vomit food you should call as you may need an x-ray dye study.

Anorexia: not feeling hungry

Again this is a side effect of the surgery: a complete lack of appetite. It is important to eat the 3 small meals per day. Please continue to drink.

Lifestyle changes after surgery

Diet after Surgery

Bariatric surgery helps you lose weight by:

- Reducing the stomach hormones that make you feel hungry
- Reduces the size of your stomach ; therefore you feel full after smaller meals

Remember

- Have small meals
- Chew your food well
- Eat slowly
- Stop when you feel full

The aim is to develop a life-long healthy eating pattern to maintain a steady weight.

The **dietitian** will be advising you in regards to your dietary changes postoperatively. It is strongly recommended that you seek their expert advice after your operation.

The following information will provide you with a guideline as to the type of foods to eat and the progression from immediately after surgery until you are on a normal diet; this is divided into 3 different stages.

Nutrition management after surgery - the 3 stages:
Stage One
Immediately post operative: day 2 to 4 weeks
Stage Two
Adaptation Phase: Weeks 4 to 8
Stage Three
Long term and weight maintenance: Week 8 to long term

Stage One	Immediately post op	Diet
	Day 2 to 3	Liquid diet
	Day 3 to 4 weeks post op	Puree diet

Stage Two	Adaptation Phase	Diet
	Week 4	Soft diet
	Week 6 to 8 post op	Full diet

Stage Three	Long term and weight maintenance	Diet
	Week 8 post op-long term	Healthy Nutrition Plan

Stage One: Immediately post op

- Initially this is ice cubes on the day of surgery.
- This is followed by clear fluids on day two and starting full fluid diet including soup, yoghurt, custard, milk, coffee
- Day three is progress to a puréed diet.

Aims

- Adequate fluid intake
- Eat and drink slowly.
- Stop when you feel full
- Getting used to the new stomach volume: try to avoid the nausea, vomiting and pain.
- Vitamin and mineral supplements

Summary in hospital	
Day one	Ice cubes
Day two	Clear fluids/free fluids
Day three	Puree diet

At Home

At home the pureed diet is started. All meals will need to be prepared with a food processor so that a smooth puree is obtained. You should not feel hungry. You will need to eat the protein first, and then include the other food groups. This diet is followed as directed by the dietitian or surgeon. The guide below must be followed.

Every day drink enough fluids, take a multivitamin tablet (Healtheries), and eat small frequent meals with protein taken first.

Adequate fluids

- Fluids are necessary to avoid dehydration and help keep the bowels regular.
- Drink at least 1 to 1.5 l of fluid a day
- Drink small volumes at a time and don't gulp
- Drink throughout the day
- Fluids include low sugar cordial, water, low fat milk, juice (with no added sugar). Avoid fizzy drinks.

Protein

- It is necessary to eat 60 grams of protein per day.
- Good sources include lean meat, fish, chicken, eggs, legumes and low fat dairy products.
- Eat the protein first at each meal.

Puree diet sample meal plan	
Breakfast:	½ 1 weetbix or ¼ - ½ cup of porridge with low fat milk
Lunch:	½ Optifast or ½ cup pureed chicken/meat/fish & vegetable soup
Dinner:	As per lunch
Morning/Afternoon Tea/ Supper:	100 ml low fat milk or low fat custard/yoghurt

Drink between meals; not at the same time.

You will not be able to eat/drink the meal replacement/ optifast in one sitting. Sip on it slowly and remember to stop when you feel full.

If you experience problems with constipation add in a fibre supplement. Make sure you are drinking plenty of fluids

Stop when you are full.

Stage Two: Adaptation phase

By the 4 week phase you should be able to tolerate a soft diet. By this time you should be tolerating the pureed diet well. It continues to be important to eat small meals and to chew slowly. It is essential that you eat the protein source first. Supplements such as Optifast can still be included. This stage of soft diet will continue for at least 2 to 3 weeks.

Soft Diet

Group 1: Cereals

- Instant porridge or semolina or weetbix (soaked in low fat milk)
- Spaghetti or noodles or rice (must be well cooked) or couscous
- Please **AVOID** fresh or soft bread

Group 2: Fruit and Vegetables

- Soft ripe, tinned or stewed fruit (no added sugar)
- Soft cooked vegetables
- Please **AVOID** stringy fruit, fruit skins and raw vegetables

Group 3: Dairy products (3 serves per day)

- Skim or low fat milk (maximum 250 ml per day – including tea/coffee)

- Low fat or calorie reduced yoghurt (1 tub of 200g/day)
- 1 slice of low fat cheese
- Please **AVOID** ice cream, milk shakes and flavoured milks

Group 4: Meat, fish, poultry, eggs, legumes (2 serves daily, 1 serve = 50 g)

- Eggs-scrambled or poached
- Lean minced meat (lamb, pork, veal, chicken) add to casseroles
- Soft, marinate fish, canned tuna/salmon
- Well cooked beans and legumes- add to soups and casseroles
- Please **AVOID** fatty or fried meats

Soft diet sample meal plan	
Breakfast:	1 weetbix or ½ cup of porridge with low fat milk Or mashed or scrambled eggs
Lunch:	1 rice cracker with tuna or low fat cheese Or steamed fish, lean mince and gravy with soft vegetables
Dinner:	As per lunch
Morning/afternoon tea/supper:	Sip on water- low fat yoghurt or 100 ml low fat milk

- Continue to sip water between meals.
- Do not eat and drink together
- Stop when you feel full

Stage Three: Long term and maintenance

Around the 6 to 8 week mark we would expect you to be able to tolerate normal consistency food. But you must remember to chew your food well and slowly. It continues to

be important that protein sources are eaten first and that you continue to eat small meals.

To ensure you reach the target weight you have set yourself and you maintain that weight you must ensure you use your surgery to its best effect and you back it up with lifelong healthy eating and exercise. The counsellor can help if you experience problems with your new eating patterns.

Avoid snacking and grazing: just the 3 meals per day. Plan your meals and make them healthy.

Introduce new foods one at a time. If there is a problem; stop that item for a week and then try again.

In the long term with some weight loss people may develop loose skin folds. You may wish to seek the opinion of a plastic surgeon in the future.

You will determine the long term outcomes.

This is an example daily meal plan.

Solid diet

Group 1:Breads and cereals (2-3 serves/day)

- Breakfast cereals-aim for a high fibre, low sugar content
- Spaghetti or noodles or rice (well cooked), couscous
- Multigrain bread: try toast first

Group 2:Fruit (2 serves/daily) Vegetables (3 to 4 serves daily)

- Fresh fruit or tinned fruit (with no added sugar)
- Variety of cooked vegetables, slowly introduce salad vegetables

Group 3: Dairy Products (3 serves/daily)

- Skim or low fat milk (maximum 250 ml/day)

- Low fat and diet yoghurt (1 tub of 200g/day)
- Low fat cheese slices, cottage or ricotta cheese (no more than 30g/day)
- Please **AVOID** ice cream, milkshakes and flavoured milk

Group 4: Meat, fish, chicken, eggs, legumes (2 serves/day. 1 serve=50 g)

- Lean meat (lamb, pork, veal, beef) fish or chicken; eggs (limit to 2 to 3 a week), baked beans and legume (chickpeas, lentils)

Group 5:Fats, oils (maximum 2 teaspoons/day)

- Use polyunsaturated or monounsaturated margarines and cooking oil

Solid diet sample meal plan	
Breakfast:	1 x weet-bix or porridge with low fat milk and ½ banana Or 1 x toast with baked beans or low fat cheese
Lunch:	1 x slice of toast or 2 x low fat cracker biscuits with tuna or low fat cheese and salad Low fat yoghurt (200 mls)
Dinner:	Small serve fish, chicken or lean meat with steamed, boiled or lightly stir fried vegetables
Morning Tea/ Afternoon tea:	Fresh fruit

Vitamins and Minerals

As the diet is small and we need you to obtain adequate nutrition it is vital to use a multivitamin. Initially this can be in a liquid form. We recommend Healtheries multivitamin.

It is imperative that you avoid vitamin and mineral deficiencies. This can happen with the small quantities of food that you are able to eat.

- Take the recommended vitamin and mineral supplements
  - Healtheries multivitamin (crushed) or a liquid equivalent
  - The vitamin supplement must contain 400 µg folate
- Have the routine blood tests
- You must attend follow up

Long Term weight maintenance

The success of weight loss depends on a change in lifestyle. Surgery gives you "the tool" with which to work. How successful this is will require a radical change in diet outlined by the dietician. It is vitally important that you take responsibility for this. Some of the key factors in achieving optimal weight loss and maintaining that loss are to:

- Monitor your weight: This must be done weekly. This will provide you with feedback on how well you are doing. If weight loss stops or there is regain of weight you will need to reappraise the situation and make appropriate changes. Review your diet and increase activity levels.
- Seek advice from a counsellor, please ask for help.
- Use your stomach effectively: The aim of the sleeve gastrectomy is to make you feel full for a long time after eating a small meal. However you must use the operation well to achieve the best results and maintain them.
  - Eat small and healthy meals: include lean meats, fruits, vegetables and low fat dairy items
  - Avoid the high calorie dense foods
  - Avoid snacking and grazing – 3 meals a day with only the snacks as directed
  - Avoid liquid calories especially soft drinks and milkshakes

- Do not drink for 30 minutes before eating and 45 minutes after eating

- Exercise Regularly:
  - Choose to exercise daily and you will enjoy it. This will be difficult initially but will become easier over time.

Follow-up post operatively	
When	What will happen during the clinic visit
Three weeks post operatively	You will be seen by the team You will discuss: ▪ Diet progress ▪ Fluid adequacy ▪ Diet adequacy ▪ Multivitamin supplements
Three months	You will be seen by the team ▪ You will discuss ▪ Diet progress ▪ Fluid adequacy ▪ Diet adequacy ▪ Multivitamin supplements Please collect a blood form for tests prior to the next visit Full screening
Six months	You will see the surgical team ▪ Review blood tests ▪ We will discuss with you ▪ Healthy long term eating ▪ Fluid adequacy ▪ Vitamin and mineral supplements

Follow-up post operatively	
One year	You will see the surgical team Full review Please collect a blood form for tests prior to the next visit Full screening
Two years	You will be seen by the team at six monthly intervals

Appendix:

Some basic concepts and ideas

- Surgery gives you the restriction. The rest comes from a combination of healthy eating and exercise. The main exercise for the first 6 weeks is walking. After 6 weeks more strenuous exercise can be introduced.
- Permanent Lifestyle change.
- Progress from fluids to pureed foods as tolerated and instructed
- Eat slowly and chew well. Try to chew 25 times.
- Avoid concentrated sugars, especially those in liquid form
- Avoid fats and fried foods they are full of calories
- The stomach can only hold about 100mls after surgery. 2-3 tablespoons of food will make you feel full. With time the stomach will stretch; this will determine the meal size.
- Stop eating when you feel full.
- Stop drinking fluids 30 minutes before meals and restart 30 to 45 minutes after eating.

- Eat 3 small meals a day and 1 high protein snack a day.
- Meals should include protein first, then fruits and vegetables, then grains.
- It is mandatory to take the vitamins we prescribe.
- Introduce new foods one at a time. If there is a problem; stop that item for a week and then try again.

Dietary suggestions

Meals:

Eat small meals and stop eating when you are full. This will prevent pain, discomfort, nausea and vomiting

Do not eat and drink at the same time

Protein:

Protein is a vital part of the diet. It is important for healing and preventing muscle loss. If not enough is eaten it results in lethargy and hair loss.

You need 60 g/day of protein

You should eat this as the first part of the meal. This includes:

- Lean meat
- Fish
- Chicken
- Eggs
- Low fat or skim dairy products

Remember

- Buy lean meat
- Trim away all visible fat and skin
- Avoid processed meats e.g. ham, salami
- Do not fry – grill, bake, steam microwave or boil

Food groups	Recommended serves for each day	Examples of serving size
Meats and alternatives Sources of protein, iron, Zinc and vitamin B12	**Aim for 2 serves daily** Low fat varieties Buy lean meat Avoid processed meat Trim all fat	▪ 50 g of meat, chicken, fish ▪ ½ cup of lean mince ▪ ½ cup of cooked beans, lentils, chick peas, split peas or canned beans ▪ 1 small egg
Dairy products Source of protein, Calcium and zinc	**Aim for 3 serves daily** Low fat/diet varieties	▪ 250 ml of low fat milk-1 cup ▪ 200g of yoghurt (1 small carton) ▪ 20g cheese (1 slice) ▪ 250 ml custard (1 cup)

Protein Counter

It is essential to obtain enough protein in the diet. You should eat protein as the first part of the meal. This table along with help from a dietician will help you find the foods with adequate protein.

Food item	Portion	Protein (grams)
Legumes		
Baked beans, kidney beans, chick peas, lentils	½ cup	7
Eggs		
Egg	1	6
Meat/ chicken/ seafood		
Beef, lamb, pork, veal	30 g	8
Chicken, no skin	30 g	8
Fish	30g	8
Prawns	5 pieces	7
Lobster, crab	30 g	5
Dairy		
Milk, skim	1 cup	8
Cheese cottage	½ cup	14
Cheese, parmesan, grated	¼ cup	12
Cheese, Ricotta	1/ cup	14
Cheese, Mozzarella	30 g	8
Yoghurt, low fat	200 mls	8
Soy items		
Soybean	½ cup	14
Tofu	½ cup	10
Textured Soy protein	½ cup	11
Soy milk, plain	1 cup	67
Soy nuts	½ cup	15

Fluids

Fluids are essential to avoid dehydration, kidney problems and to help regular bowel function

- Drink 1.5 l of fluid/day
- Drink up to 30 minutes before meals; don't start again until 30 to 45 minutes after eating
- Sip, sip, sip
- Avoid drinks that contain calories, otherwise weight loss will be affected.

Alcohol

Alcohol is more rapidly absorbed after surgery. You will be affected more after surgery. Alcohol contains calories and has no nutritional benefits. Please limit alcohol.

Do not Drink and Drive.

Fibre

Fibre is important for you to maintain a regular bowel habit. It is a good idea to use a fibre supplement and to drink plenty of water with it.

As the diet changes and variety increases it may be possible for you to drop the fibre supplement.

Don't let constipation become a problem; if it becomes a problem please let us know.

Notes

Capital & Coast
District Health Board
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