

# OPTIFAST<sup>®</sup> VERY LOW CALORIE DIET



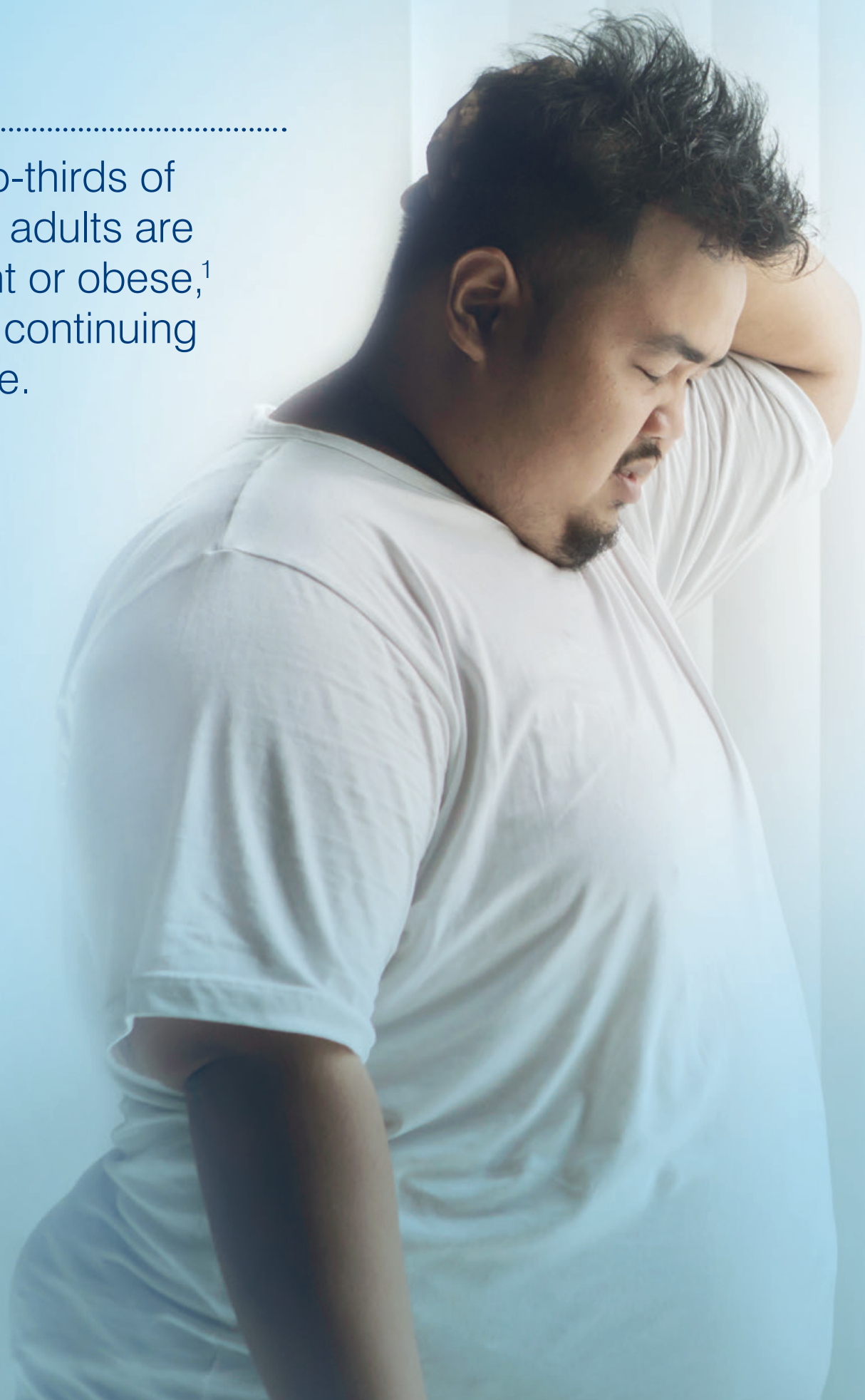
## Preoperative Protocol

Version 2

OPTIFAST VLCD is for the dietary management of obesity and must be used under the supervision of a healthcare professional. Information for healthcare professional use only.

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Nearly two-thirds of Australian adults are overweight or obese,<sup>1</sup> with rates continuing to increase.



# OPTIFAST VLCD

## Preoperative Protocol

Obesity is strongly associated with several chronic diseases including type 2 diabetes, cardiovascular disease and some cancers.<sup>2</sup> As well as this, obesity is a risk factor in surgery, despite improvements in anesthesiological methods and surgical techniques.<sup>3</sup>

Weight loss in patients with severe obesity is therefore important to improve health, gain better control of co-morbid disorders, improve quality of life and in particular to reduce perioperative risks in those requiring surgery. Many obese patients requiring surgery may in fact have their surgery postponed until significant weight loss has been achieved in order to reduce surgical and post-surgical risks.

Weight loss surgery, also known as Bariatric surgery has more than doubled in the last decade in Australia,<sup>1</sup> becoming increasingly prevalent for the management of morbid obesity (BMI >40kg/m<sup>2</sup>) and those with a BMI >35kg/m<sup>2</sup> with co-morbidities. It is considered the most effective long-term treatment for severe obesity resulting in greater overall weight loss than any other forms of treatment.<sup>2</sup> However, features of severe obesity can increase the complexity of the bariatric surgical procedure and may increase the perioperative complications.

Given the increase in bariatric surgeries performed, the need for preoperative weight loss has also increased. This is, in part, driven by the necessity to optimise the safety of surgery, in particular by reducing the likelihood of conversion from laparoscopic to an open procedure or having the surgical procedure postponed until further weight loss has been achieved. Preoperative weight loss can also reduce factors such as vascularity of the fat tissue, restricted respirator movements and poorly controlled blood glucose levels in patients with diabetes, all of which increase the risk of surgery in patients with obesity.<sup>3</sup>

In a study, 30 patients following a 7–24 week pre-surgery very low energy diet (VLED) program, supported by individual therapy sessions, had a mean weight loss prior to surgery of 15% of initial weight, or 19.6kg (mean pre-treatment weight 125kg), with a low drop-out rate of 7%.<sup>3</sup> Importantly, these improvements were seen in patients who had failed previous weight control programs. In addition, treatment with short-term very low energy diets has been shown to reduce the severity of many co-morbid conditions such as diabetes, hypertension, dyslipidaemia and sleep apnoea. Serious complications with short term very low energy diets are uncommon.<sup>4</sup>

For patients undergoing elective surgery, the necessity for surgery among patients with morbid obesity could be more reliably evaluated after intensive weight loss. The need for surgery for some conditions i.e. urinary incontinence and osteoarthritis of the weight-bearing joints may be reduced, with the patients no longer requiring surgery if significant weight loss is achieved.<sup>3</sup>

VLED programs have been used to provide rapid weight loss in patients prior to bariatric surgery and is also considered in patients whose elective surgery has been postponed due to being overweight.<sup>3</sup> VLEDs such as the Intensive Level of the OPTIFAST VLCD Program can provide significant weight loss and has been suggested for preoperative weight loss.<sup>4</sup>

The OPTIFAST VLCD Program is a nutritionally complete total diet replacement. It is scientifically formulated to assist medically at-risk patients lose weight quickly and safely, and lower weight-related health risks. During the Intensive Level of the OPTIFAST VLCD Program, weight loss averages 1.0 to 2.5 kg/week with an average total loss of 20kg if followed for 12 to 16 weeks.<sup>4-6</sup>

This protocol has been developed in consultation with the following experts. We would like to thank them for their contribution, feedback and review.

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This *OPTIFAST VLCD Preoperative Protocol* is a work in progress and will continue to evolve over time. Resources are currently focused on improving patient outcomes, reducing community costs and encouraging a multidisciplinary approach to chronic weight management.

### Please note:

We would appreciate any feedback or comments you may have on how to improve this protocol and make it more relevant to you and your practice.

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## Pre-bariatric surgery guidelines



# Bariatric surgery

Surgery is considered the most effective long-term treatment for severe obesity, with good weight management demonstrated between 2 and 20 years post surgery.<sup>2,7</sup> A Cochrane review concluded that surgery results in greater improvement in weight loss outcomes and weight associated co-morbidities compared with non-surgical interventions.<sup>8</sup>

Bariatric surgery has shown to be a cost-effective treatment for obesity compared to other non-surgical interventions.<sup>9</sup> However, many patients are under the impression that undergoing surgery for obesity will result in inevitable and durable weight loss. The bariatric surgical procedure, despite its powerful effect, is only one part of a comprehensive weight loss program. Greatest success is achieved with surgical patients who are well prepared both physically and mentally for the procedure, and who adhere to a long-term regular monitoring protocol.

Ongoing preoperative and postoperative follow-up and support is essential for an optimal outcome, and patients need to understand that permanent lifestyle changes are required to optimise the duration and extent of weight loss following surgery. Pre-surgery evaluation is necessary not only to identify preoperative nutritional deficiencies but to evaluate a patient's ability to incorporate nutritional changes before and after weight loss surgery.<sup>10</sup>

## Types of bariatric surgery

The primary bariatric procedures performed include:

1. Laparoscopic adjustable gastric banding (LAGB)
2. Laparoscopic sleeve gastrectomy (LSG)
3. Roux-en-Y gastric bypass (RYGB)

Over recent years there have been salient advances in bariatric surgery. The most common weight loss procedure in Australia for both public and private hospitals is the laparoscopic sleeve gastrectomy (LSG). The number of LSG procedures has increased with greater third-party pay or coverage.<sup>11</sup>

Surgery is generally offered to patients with a BMI  $\geq 40\text{kg/m}^2$  without coexisting medical problems and for those with a BMI of  $\geq 35\text{kg/m}^2$  with one or more severe obesity related co-morbidities,<sup>11</sup> as long as it is not associated with excessive risk.

Data is also emerging regarding the use of bariatric surgery in specific patient populations, including those with mild to moderate obesity, Type 2 diabetes mellitus (T2DM) with Class I obesity (BMI 30–34.9 $\text{kg/m}^2$ ), and patients at the extremes of age. Clinical studies have demonstrated short-term efficacy of LAGB in mild

to moderate obesity, leading the Food and Drug Administration (FDA) to approve the use of LAGB for patients with a BMI of 30 to 35 $\text{kg/m}^2$  with T2DM or other obesity related co-morbidities.<sup>11</sup>

## Surgical complexities of bariatric surgery

Laparoscopic procedures are preferred because of their lower rates of morbidity and mortality, which includes:<sup>8,10,12</sup>

- Reduced blood loss
- Reduced proportion of patients requiring intensive care unit stay
- Reduced length of hospital stays
- Reduced risk of incisional hernia
- Reduced days to return to activities of daily living
- Reduced days to return to work

However, excess visceral adiposity and hepatomegaly associated with steatosis increases the technical difficulty of laparoscopic surgery because these features obstruct the surgical field.<sup>13,14</sup> The presence of an enlarged liver and excessive intra-abdominal fat reduces operating space and exposure, and may hide important anatomical markers. Access to the upper stomach and gastroesophageal junction becomes more difficult, increasing the complexity and risks of surgery. The presence of hepatomegaly also makes retraction during surgery more difficult.

Australian researchers have shown that hepatomegaly or excessive visceral fat are the most common reasons for conversion from laparoscopic to open surgical procedures or, more commonly these days, for the procedure to be abandoned until desirable weight loss has been achieved.<sup>15</sup>

Excessive visceral fat stores and hepatomegaly are more often seen in people with central obesity (waist circumference  $\geq 88\text{cm}$  in women and  $\geq 102\text{cm}$  in men), the super-obese (BMI  $>50$ ), or those with metabolic abnormalities.<sup>16-19</sup>

Reducing abdominal fat and liver size prior to laparoscopic surgery is therefore highly desirable in order to minimise risks and difficulty of surgery.

## Additional complexities in the super-obese

People who are super-obese pose additional risks to the bariatric surgery team. There are more intraoperative complications in the super-obese compared to those who are morbidly obese, and the extreme central and upper body obesity in these patients can make endotracheal intubation and mechanical ventilation very difficult.<sup>20-22</sup> The laparoscopic operative field is often very hard to visualise in the super-obese patient, and the creation of the pneumoperitoneum can be difficult to achieve.<sup>23</sup> There is also a higher rate of conversion to open surgery.

# Benefits of pre-surgical weight loss

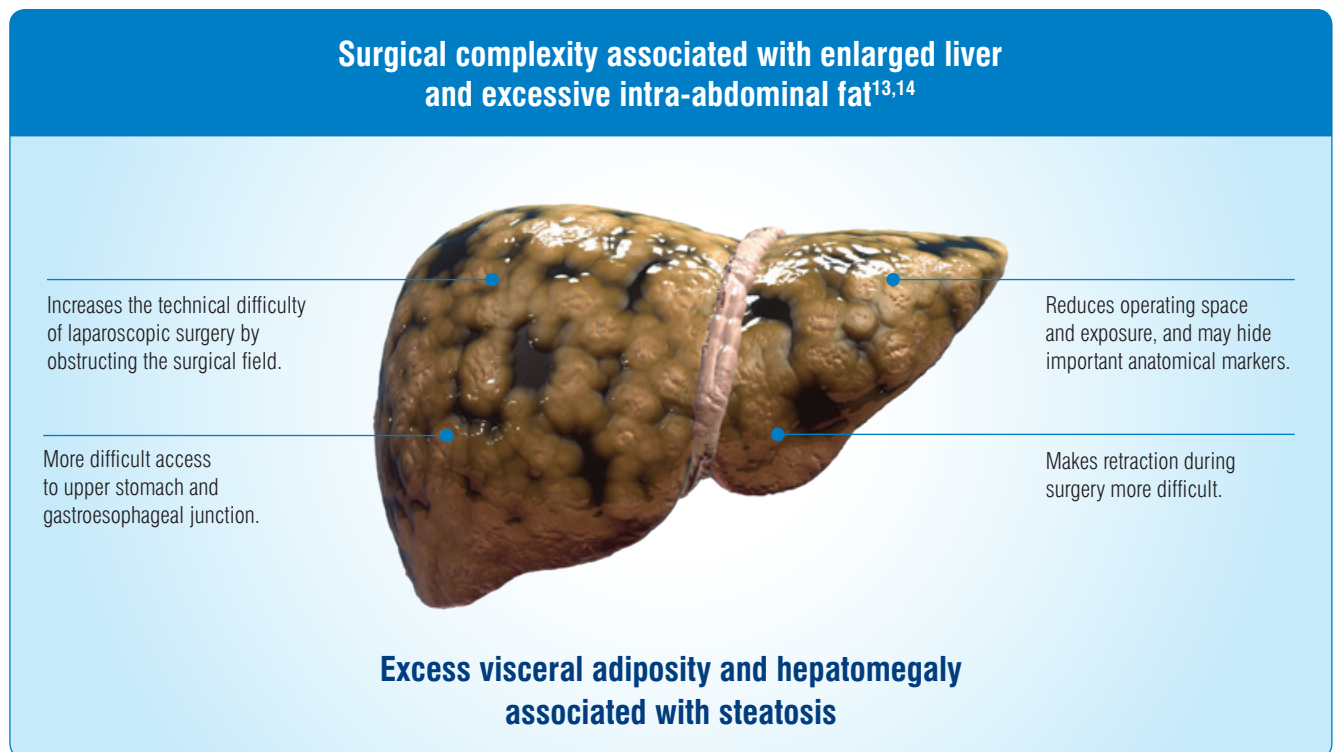
Some of the complexities of bariatric surgery may be overcome with weight reduction prior to surgery. However, it is essential that clinicians and patients realise that the initial weight loss program is seen as the commencement of a lifelong management plan incorporating surgery, behavioural change, dietary modification, and increased exercise and movement.

Pre-surgical weight loss should be recommended to all patients with morbid obesity (BMI  $\geq 40\text{kg/m}^2$ ) and for individuals with a BMI  $>35\text{kg/m}^2$  as they can often suffer from fatty liver, poor blood glucose level control and sleep apnoea.<sup>3</sup> The following points highlight the benefits of pre-surgical weight loss.

## Reduced visceral fat levels and liver size

Weight loss prior to bariatric surgery can effectively reduce visceral fat levels and liver size, leading to greater access for the surgeon and less chance of conversion from laparoscopic to open procedure.

Figure 1



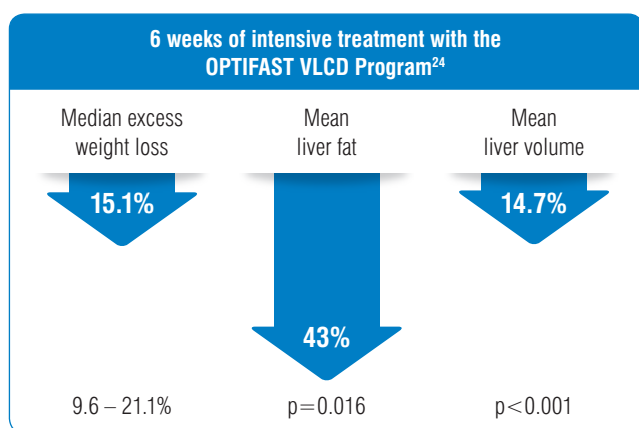
Australian researchers have shown that hepatomegaly or excessive visceral fat are the most common reasons for conversion from laparoscopic to open surgical procedures.<sup>15</sup>

Following are two studies that demonstrate the effectiveness of the OPTIFAST VLCD Program in patients prior to bariatric surgery.

### Lewis et al.

18 morbidly-obese patients underwent MRI and spectroscopy to measure liver size and fat content before and after 6 weeks of intensive treatment with the OPTIFAST VLCD Program.<sup>24</sup> Significant results were achieved in the reduction of liver fat and volume, as seen in Figure 2 below.

Figure 2

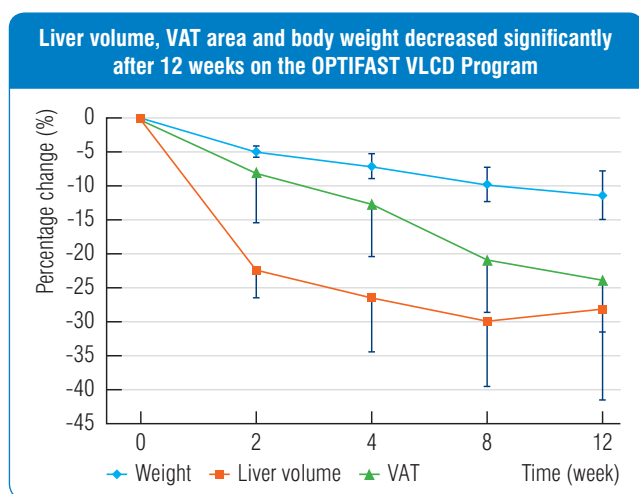


*'The reduction in liver fat and volume likely accounts for the perceived improved operability in patients undergoing LAGB.'*<sup>24</sup>

### Colles et al.

32 morbidly-obese patients followed the OPTIFAST VLCD Program for 12 weeks with measurements including changes in liver volume and visceral/subcutaneous adipose tissue (VAT/SAT) taken at baseline and weeks 2, 4, 8 and 12.<sup>25</sup> The most significant improvement in liver volume is seen after 2 weeks, as can be seen in Figure 3 below.

Figure 3



Adapted from Colles S et al. 2006.<sup>25</sup>  
p<0.001 for all three measures at week 12 vs. baseline.

A 6-week duration of the OPTIFAST VLCD Program was recommended to achieve maximal liver volume reduction.<sup>25</sup>

## Reduced pre-existing metabolic abnormalities

Weight loss has a strong beneficial effect on the co-morbidities of obesity, including hypertension, hyperlipidaemia, insulin resistance, hyperglycaemia, sleep apnoea.<sup>26-28</sup> The positive effects on these parameters are usually related to the degree of weight loss achieved, although even a modest weight loss of 5–10% of starting weight can result in significant health benefits.<sup>2</sup> Weight loss also favourably reduces clotting factors and may reduce the risk of post-surgery deep venous thrombosis.<sup>29-31</sup>

## Improved perioperative outcomes

Pre-surgical weight loss can improve respiratory mechanics, and reduce the metabolic, pro-inflammatory and pro-fibrotic elements of the metabolic syndrome commonly seen in severely obese patients. These improvements may reduce the risk of complications in the postoperative phase.<sup>26-31</sup>

## Sensitises the patient to postoperative requirements

Weight loss prior to surgery can sensitise patients to the potential benefits of complying with the dietary restrictions that will be required postoperatively.<sup>32</sup> Successful preoperative weight loss may also increase patients' confidence that they can deal with postoperative requirements. A study examining weight loss with a very low energy diet in the pre-bariatric surgery setting found that patients began to make lifestyle changes before their surgery that potentially helped them to adjust to the postoperative requirements.<sup>3</sup>

## Better management of medication changes

Significant weight loss may influence dosage requirements of some medications. Managing these medications during the preoperative weight loss phase will make it easier during the acute postoperative phase.



# Patient suitability for preoperative weight loss

Indications for bariatric surgery are evolving as safety is increasing and more long-term data demonstrates its effectiveness.<sup>33-35</sup>

Overall, preoperative weight reduction may be considered in any candidates for obesity surgery, but is best suited to well-motivated patients who have acceptable operative risks and strongly desire substantial weight loss. In regards to either bariatric or other types of surgery, preoperative weight loss should be considered for patients who are at higher surgical risk, including:

- Super-obese patients with a BMI >50;
- Patients with a BMI >40 and central obesity or android distribution of body fat. This would include all men, and women with central obesity, polycystic ovary syndrome, diabetes or the metabolic syndrome;
- Any patient with a BMI >35 and high-risk co-morbid conditions or obesity-induced conditions that interfere with lifestyle;
- Patients with severe obstructive sleep apnoea.

Previous successful or unsuccessful attempts at using very low energy diets as a weight loss method should not be seen as a reason to avoid short-term use in the preoperative setting.



# The OPTIFAST VLCD Program: Pre-bariatric surgery protocol for weight loss

## Pre-treatment assessment

All patients who have been accepted for bariatric surgery and a preoperative OPTIFAST VLCD Program should be evaluated by a multidisciplinary team with medical, surgical and nutritional expertise.<sup>2</sup> During this evaluation, it is important to listen carefully to patient expectations and to provide patients with a realistic assessment of probable outcomes.

Nutritional status should be assessed prior to surgery or before commencing a VLCD program prior to surgery. Research shows a high incidence of malnutrition in people undergoing surgery.<sup>9</sup> Poor nutritional status prior to surgery can lead to suboptimal immunity and wound healing, which can increase the risk of infection. Persisting deficiencies will lead to problems such as anaemia and osteoporosis if not addressed.<sup>9,36</sup>

During the nutritional assessment the evaluation should include a micronutrient assessment. This includes but is not limited to, iron studies, vitamin B12, folic acid, and vitamin D and zinc.<sup>9</sup> Obesity related biomarkers such as fasting blood lipids, blood glucose levels, HbA1c, fasting insulin, inflammatory markers such as CRP and liver function should also be assessed prior to treatment. These values provide baseline measures to track change over time.

Patients should have a clear understanding of basic nutrition, and nutritional counselling and support by a dietitian is recommended. In addition, patients need to understand the risks and benefits of the OPTIFAST VLCD Program, the surgical procedure and postoperative dietary and lifestyle requirements, including the need for long-term follow-up and vitamin/mineral supplementation.<sup>11</sup> They also need to fully understand the required substantial changes to their long-term future eating habits, and that lifelong medical surveillance will be essential after surgery.<sup>2</sup>

## Assessment checklist

1. Weight
2. BMI
3. Micronutrient assessment (iron, B12, folic acid, vitamin D, and zinc).
4. Calculate adjusted ideal body weight (Adj IBW).
5. Calculate protein requirements.
6. Identify GI problems, allergies or intolerances.
7. Screening for obesity related biomarkers (fasting blood lipids, blood glucose level, HbA1c, fasting insulin, inflammatory markers, and liver function tests).
8. Screen for weight sensitive medication and start management, treatment plan.

## Adjusted Ideal Body Weight (IBW)

Ideal body weight is calculated to help determine an appropriate weight for height or to determine a long-term weight loss goal. It can also be used to calculate energy and protein requirements. When estimating an Ideal Body Weight or Goal Weight for individuals with a BMI >30kg/m<sup>2</sup> calculating the 'Obesity Adjusted Ideal Body Weight' (Adj IBW) is a common approach.<sup>37,38</sup>

This equation allows for 25% of excess metabolically active body weight (lean muscle mass) which is commonly seen in individuals with obesity, giving you a more appropriate estimate of an Ideal Body Weight for that individual.

It is important to remember that even a 5–10% weight loss can result in significant reductions in co-morbidities and may be all that is required prior to surgery. Adj IBW may therefore serve as a longer-term goal following the surgical procedure.

**Equation for calculating Adjusted Ideal Body Weight is:**



$$\text{Adj IBW} = [(\text{Actual Body Weight} - \text{IBW}) \times 0.25] + \text{IBW}$$

Where IBW = Weight at BMI 25kg/m<sup>2</sup> (see Table 1)



Table 1: Ideal Body Weight (Weight at BMI 25kg/m<sup>2</sup>)

Height in cm	IBW (Weight at BMI 25kg/m <sup>2</sup> )
140	49
142	50
144	52
146	53
148	55
150	56
152	58
154	59
156	61
158	62
160	64
162	66
164	67
166	69
168	71
170	72
172	74
174	76
176	77
178	79
180	81
182	83
184	85
186	86
188	88
190	90
192	92
194	94
196	96
198	98
200	100

## Protein requirements

Adequate protein intake pre-surgery and during preoperative weight loss is important to help preserve fat free mass and control appetite.<sup>39</sup> Protein requirements for obesity/weight loss are suggested to be 0.75g–1.0g Adj IBW.<sup>37</sup> Evidence suggests that loss of fat free mass during weight loss can be attenuated by diets providing protein intakes of >0.8g/kg body weight/day.<sup>39</sup> Research has been mixed on the amount of protein level required for preventing loss of fat free mass during severely energy restricted diets.<sup>39</sup> We propose that >0.8g/kg Adj IBW/day be used as a basis for calculating protein requirements, however this is at the discretion of the treating healthcare professional. Post-surgical protein requirements on the other hand may be higher at around 1–1.5g/kg Adj IBW/day.<sup>9,11</sup> Therefore, aiming for protein requirement at the upper end may be more beneficial.

Consuming three OPTIFAST VLCD products per day provides between 57.6–84g of protein depending on what combination of products are consumed. This meets the protein requirements for most females that are obese/losing weight. Most males and individuals with a BMI >35kg/m<sup>2</sup> may need extra protein. There are several ways to provide additional protein to meet increased requirements:

- Supplementing with a pure protein, powdered supplement (e.g. BENEPROTEIN);
- Supplementing with lean protein-rich foods (e.g. meat, chicken, fish, eggs);
- Increasing the number of OPTIFAST VLCD products used.
- Replacing 1, 2 or 3 standard OPTIFAST VLCD products with OPTIFAST VLCD ProteinPlus.

The method used to increase protein should be based on the best outcome for the individual. A cost-effective option is to add a pure protein supplement such as BENEPROTEIN, which contains 6g of protein and 25kcal (104kJ) per 7g scoop, no carbohydrate, dissolves readily in water and is relatively tasteless.

If using food sources of protein, one serve of protein is equivalent to 65–100g meat, 2 eggs or 130g fish and can be added to the evening vegetables. This will provide approximately 25g of protein and an additional 150kcal (630kJ) to the daily intake of 800kcal.

Increasing the number of OPTIFAST VLCD products per day can be another option to increase protein intake. However, if extra OPTIFAST VLCD products are prescribed/consumed (i.e. more than the recommended three products per day), carbohydrate and calorie intakes will also increase and therefore may affect ketosis on the Intensive Level.

OPTIFAST VLCD ProteinPlus can be used in place of the standard OPTIFAST VLCD products at any level of the OPTIFAST VLCD Program. OPTIFAST VLCD ProteinPlus contains 40% more protein than the standard OPTIFAST VLCD products, and also contains less lactose making them a suitable alternative for people with higher protein needs or a lactose intolerance.

Table 2: Protein, energy and carbohydrate content of OPTIFAST VLCD products, plus additional protein sources

	Protein (g/day)	Energy (kcal/day)	Carbohydrate (g/day)
3 OPTIFAST VLCD per day	57.6–60	603–714	54.6–70.2
3 OPTIFAST VLCD ProteinPlus per day <sup>§</sup>	84	750	60
<b>Adding BENEPROTEIN</b>			
3 OPTIFAST VLCD per day plus 1 scoop (7g) of BENEPROTEIN per product	75.6–78	678–789	54.6–70.2
3 OPTIFAST VLCD per day plus 2 scoops (14g) of BENEPROTEIN per product	93.6–96	753–864	54.6–70.2
<b>Adding food source of protein<sup>†</sup></b>			
3 OPTIFAST VLCD per day plus 1 serve of protein	82.6–85	753–864	54.6–70.2
3 OPTIFAST VLCD per day plus 2 serves of protein	107.6–110	903–1014	54.6–70.2
4 OPTIFAST VLCD per day plus 1 serve of protein	101.8–105	954–1102	72.8–93.6
<b>Adding extra OPTIFAST VLCD products</b>			
4 OPTIFAST VLCD per day	76.8–80	804–952	72.8–93.6
5 OPTIFAST VLCD per day	96–100	1005–1190	91–117

The energy, protein and carbohydrate calculations when incorporating BENEPROTEIN or an additional food source of protein shown in this table have been calculated when using standard OPTIFAST VLCD products. <sup>§</sup>OPTIFAST VLCD ProteinPlus can replace one, two or three standard OPTIFAST VLCD products per day while following the OPTIFAST VLCD Program, depending upon individual protein requirements. <sup>†</sup>1 protein serve is equal to 65–100g meat, chicken containing approximately 25g protein and 150 calories.

## The OPTIFAST VLCD Intensive Level for pre-bariatric surgery (minimum 2 weeks)

**INTENSIVE LEVEL**      Up to 12 weeks | <800 Calories Daily

3 OPTIFAST VLCD Products      ≥ 2 Cups of Low Starch Vegetables<sup>†</sup> plus 1 tsp of Vegetable Oil per day      2 Litres of Water

<sup>†</sup>See allowed low starch vegetables in the 'Allowed Foods' table on page 12.

Weight loss during the Intensive Level is achieved by the restriction of carbohydrate and total energy intake. This enables the body to use its body fat stores for energy via a metabolic process called ketosis. Ketosis is a metabolic response that occurs when following the OPTIFAST VLCD Program Intensive Level. Ketones provide an alternative fuel source derived from fat when glucose is in short supply.<sup>40</sup>

The Intensive Level of the OPTIFAST VLCD Program should be recommended to encourage the best results. The duration of the Program must be considered in the context of scheduling surgery, with the aim of ensuring maximal weight loss prior to

surgery, reducing surgical risk factors and motivating the patient. Patients should aim for a minimum of 2 weeks of the Intensive Level prior to any bariatric surgical procedure in order to achieve a maximum reduction in liver volume. However, in many clinics the duration of the pre-surgical VLCD program is decided by the dietitian and surgeon and is based on the patient's BMI, degree and position of adiposity, as well as co-morbidities.

For patients with longer wait times prior to surgery or requiring higher rates of weight loss, the full Intensive Level (up to 12 weeks) can be followed.

## Intensive Level

During the Intensive Level an individual will take an OPTIFAST VLCD product three times daily as a substitute for breakfast, lunch and dinner and all snacks. Alternatively, OPTIFAST VLCD products can be evenly spread throughout the day. For example, ½ bar for morning tea and ½ bar for afternoon tea if this helps with compliance. Please refer to the sample meal plans for ideas on how the OPTIFAST VLCD products can be distributed

throughout the day. In addition to this, patients need to consume a minimum of 2 cups of non-starchy vegetables (see Allowed Foods table on **page 12**), 2 litres of water and 1 teaspoon vegetable oil each day. The addition of the vegetables assists in providing fibre, water and nutrients, as well as the social aspect of eating.

Table 3: Sample Meal Plans for the Intensive Level

Meals	Sample Meal Plan 1	Sample Meal Plan 2	Sample Meal Plan 3
<b>Breakfast</b>	<b>1 OPTIFAST VLCD Shake</b>	<b>1 OPTIFAST VLCD Shake</b>	<b>1 OPTIFAST VLCD ProteinPlus Shake</b>
<b>Morning Tea</b>	½ <b>OPTIFAST VLCD Bar</b> Tea/coffee (either black or with up to 30mL of skim milk and no sugar)	Tea/coffee (either black or with up to 30mL of skim milk and no sugar)	Tea/coffee (either black or with up to 30mL of skim milk and no sugar)
<b>Lunch</b>	<b>1 OPTIFAST VLCD Soup</b>	<b>1 OPTIFAST VLCD Shake</b>	<b>1 OPTIFAST VLCD Bar</b>
<b>Afternoon Tea</b>	½ <b>OPTIFAST VLCD Bar</b> Tea/coffee (either black or with up to 30mL of skim milk and no sugar)	Vegetable sticks	1 cup of low starch vegetables
<b>Dinner</b>	2 cups of low starch salad or vegetables with 1 tsp of vegetable oil and other allowed condiments	2 cups of low starch salad or vegetables with 1 tsp of vegetable oil and other allowed condiments	<b>1 OPTIFAST VLCD Soup</b> plus 1 cup of low starch vegetables with 1 tsp of vegetable oil
<b>Supper</b>	Herbal tea 125mL of diet jelly	<b>1 OPTIFAST VLCD Dessert</b>	Herbal tea
<b>Total Nutrient Intake</b>	<b>753 calories</b> <b>64.2g protein</b> <b>68.5g carbohydrate</b>	<b>744 calories</b> <b>65g protein</b> <b>65g carbohydrate</b>	<b>793 calories</b> <b>73g protein</b> <b>66g carbohydrate</b>

## Allowed vegetables and additional food allowances

The recommended allowed vegetables on the OPTIFAST VLCD Program are low starch or low carbohydrate and also low calorie. The table on **page 12** lists what vegetables are recommended whilst on the OPTIFAST VLCD Intensive Level.

The OPTIFAST VLCD Program calls for at least 2 cups a day of allowed vegetables, and doubling that quantity makes little difference to weight loss as long as the recommended allowable vegetables are consumed. Eating vegetables during the program is an important part of helping patients with the transition onto a balanced, calorie-controlled diet after the surgery has been completed.

We do not recommend deviating from the list as other foods may have a higher carbohydrate and calorie content and could affect ketosis and appetite regulation.

Additional low energy foods (soups, sauces, condiments, herbs, spices and miscellaneous items) are also allowed whilst following the OPTIFAST VLCD Program. These are designed to add variety to meals and assist in compliance.





Table 4: Allowed Vegetables and Additional Allowances during the Intensive Level of the OPTIFAST VLCD Program

Allowed				Avoid
<b>Low starch vegetables</b>				
Alfalfa sprouts Asparagus Bean Sprouts Bok Choy Broccoli Brussels sprouts Beetroot (30–40g) Cabbage Capsicum	Carrots (30–40g) Cauliflower Celery Cucumber Eggplant Green beans Konjac noodles (Slendier/ Slim Pasta range)	Lettuce (all types) Leeks Mushrooms Onions Radishes Shallots Silverbeet	Snow peas Spinach Squash Tomatoes Watercress Zucchini	Corn Green peas Legumes Lentils Potato Sweet potato Parsnip Pumpkin Turnip
<b>Soups</b>				
Stock cubes	Bonox (in moderation)	Vegetable soups made from allowed vegetables	Miso soup	All other soups
<b>Sauces and Condiments</b>				
Lemon and lime juice Vinegar	Worcestershire sauce Tabasco sauce	Soy sauce (in moderation) Chilli	Mustard Tomato paste	Cream High calorie simmer sauces and dressings
<b>Herbs and Spices</b>				
All spice Basil Celery flakes Chilli Chives Cinnamon Cloves	Coriander Cumin Curry powder Dill Fennel Garlic Ginger	Lite salt Mint Mustard seed Nutmeg Oregano Paprika Parsley	Pepper Rosemary Sage Thyme Turmeric Tarragon	
<b>Miscellaneous</b>				
Artificial sweeteners# Sugar-free lollies and gum (1–2 pieces per day)	Flavour essences (½–1 tsp)	Diet jelly (125g)	Diet topping (1–2 tsp)	
<b>Low energy drinks</b>				
Water Soda water	Diet soft drinks and cordial Plain mineral water	Tea and coffee (no or 30mL skim milk and no sugar)	Herbal teas	Fruit juice Alcohol Soft drinks Cordial

Additional condiments can be included as part of the Intensive Level of the OPTIFAST VLCD Program once a day, provided they contain no more than 50kJ and up to 2g of carbohydrate per serve. #It is important to note that large amounts of sugar-free lollies can add additional kilojoules and cause gastrointestinal discomfort. Please only use in moderation.

## Monitoring & support

OPTIFAST VLCD must be taken under the supervision of a healthcare professional such as a dietitian, doctor, pharmacist, diabetes educator or other trained healthcare professionals. As a healthcare professional, you can tailor the plan to suit your patients' specific likes and dislikes, medical conditions, nutritional needs, physical activity levels and lifestyle.

Patients taking medications for co-morbid conditions such as type I and II diabetes, hypertension, dyslipidaemia, as well as patients on lithium, anticoagulant or anticonvulsant therapy, should be closely monitored while on the OPTIFAST VLCD Program. In the initial weeks of the program, blood glucose, blood pressure and serum cholesterol may significantly decrease and a change to medication dosages may be required. For the management of complex cases and patients on medications

please refer to the *OPTIFAST VLCD Clinical Treatment Protocol* and the *OPTIFAST VLCD Management of Complex Cases*.

After implementation of the OPTIFAST VLCD Intensive Level, frequent monitoring and support from a healthcare professional is essential. Monitoring frequency should be established and agreed with the client, which may be weekly initially, and should involve review of diet recommendations, dealing with difficult situations, monitoring of weight, blood pressure and review of any medications.

Behavioural support is a crucial part of the program. Support is ideally provided from several sources, e.g. dietitian, psychologist, pharmacist, diabetes educator, exercise physiologist, GP, practice nurse. Ongoing positive support and encouragement is essential, and will also help to motivate the patient for the changes that are required following surgery.

# Postoperative nutritional management

A person's nutritional needs change dramatically following bariatric surgery as the capacity to eat food is significantly reduced. All patients requiring additional weight loss following surgery should be referred to a dietitian for long-term management.

## Nutritional management post-bariatric surgery

For patients who have undergone bariatric surgery, over several weeks and months post surgery, food intake progresses from clear to full fluids, followed by pureed foods, a soft food diet and eventually consumption of regular foods that are extremely well chewed. A danger during this time is low or inadequate protein intake. It is therefore recommended that after surgery, patients consume foods and supplements that are high in protein and are fortified with key nutrients. There are no standard recommendations for protein intake post-bariatric surgery however intakes of 60g–80g/day or 1–1.5g/kg adjusted ideal body weight/day are generally recommended.<sup>9,11</sup> Patients are encouraged to meet these needs by consuming liquid protein supplements. Protein supplements are recommended until the patient is able to take in enough food sources of protein to meet daily needs.<sup>41</sup>

OPTIFAST VLCD Shakes, Soups and Desserts are appropriate supplements to meet the nutritional needs of bariatric surgery patients, and can be used after surgery once the patient has progressed from clear fluids to full fluids. All formulas have adequate protein to preserve lean body mass during weight loss as well as tissue building and repair, assisting in healing after surgery. Individual protein requirements need to be calculated and the products modified in order to achieve this.

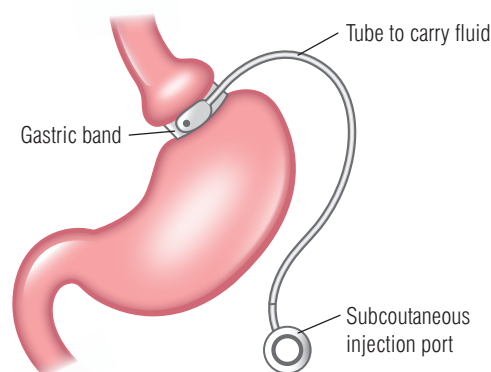
Nutrient deficiency post surgery depends on the surgical procedure, preoperative deficiencies, sustained postoperative nausea & vomiting, food intolerances, modified eating behaviour and non-adherence to dietary and supplement recommendations. Common deficiencies include calcium, vitamin D, iron, vitamin B12, thiamin (B1), vitamin A, vitamin E, vitamin K, zinc and copper. The OPTIFAST VLCD products are a good source of thiamin providing over 100% of the RDI for adult men and women, when at least two products or more are consumed. Thiamin deficiency can affect up to 50% of post-surgery patients resulting in death and/or serious complications.<sup>42</sup>

Based on the type of surgery being performed, nutritional needs differ slightly. These are highlighted below:

### Gastric banding

The gastric band restricts the entrance of food into the stomach, however because the digestive system is virtually unchanged this form of surgery has the least nutritional problems over the long term. Following a gastric band, food volume decreases to below normal levels required for nutritional adequacy therefore a bariatric multivitamin is usually recommended. It is important to note that in some individuals Gastric Banding can result in GIT symptoms and hence maladaptive eating. In these cases, patients will generally present for band revision or conversion to other surgeries.

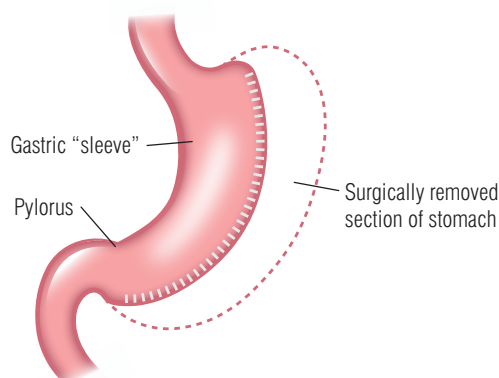
Figure 4: Gastric Banding



### Sleeve gastrectomy

The sleeve gastrectomy procedure removes about two thirds of the stomach leaving a small pouch of approximately 110ml. This greatly reduces the amount a person can eat or drink at one time. Due to the reduction in the stomach lining 'Intrinsic Factor' is reduced which affects the absorption of vitamin B12 further down the digestive tract. For this reason, a vitamin B12 deficiency can develop over time. A bariatric multivitamin with added thiamin, folic acid, calcium, iron and B12 is recommended.

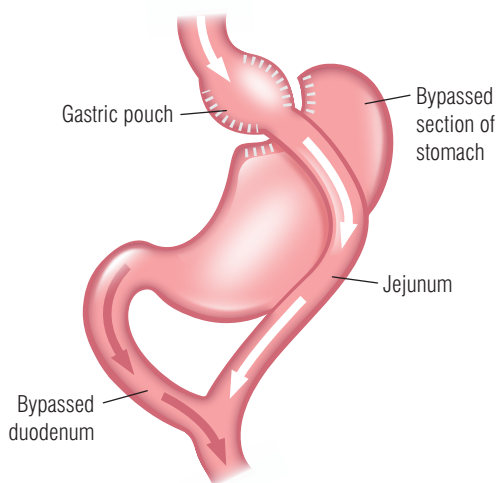
Figure 5: Sleeve Gastrectomy



## Roux-en-Y gastric bypass

In the Roux-en-Y gastric bypass, a small stomach pouch is developed (30–50ml) to restrict food intake. A Y-shaped section of the small intestine is attached to the pouch to allow food to bypass the stomach, duodenum and the first segment of the jejunum. Because a small portion of the intestine has been bypassed, some nutrients will not be well absorbed. A multivitamin containing high levels of B12, folate, and iron daily is recommended along with calcium citrate 1200–1500mg from all sources and 3000IU of vitamin D per day.<sup>10</sup>

Figure 6: Roux-en-Y Gastric Bypass



Surgery is not a magic wand - patients will need to make appropriate lifestyle choices and establish good eating habits in the long-term to assist with weight loss and maintain it long-term. This will not only minimise complications but will also ensure good health through durable weight loss.

The introduction of food post-bariatric surgery includes the following:

### Stage One – Fluid diet

Following surgery, a liquid diet is recommended for 2 to 4 weeks. Whilst in hospital a clear fluid diet may be prescribed. This will include small amounts (50ml/hour) of clear broth, apple juice, tea and coffee. Once this is tolerated a full fluid diet can be recommended.

Full fluids are fluids which can pass through a straw, including soups and milk products. Juices are generally not recommended to minimise carbohydrate intake. A meal replacement liquid such as the OPTIFAST VLCD Shakes, Soups and Desserts can be recommended during this time. The OPTIFAST VLCD Shakes and Desserts have added protein, vitamins and minerals. This will allow the patient to meet energy requirements whilst maintaining a low-calorie intake to assist with weight loss. Although 'Recommended Dietary Intakes' aren't applicable to weight loss surgery patients or any patient having undergone surgery, Table 5 does provide some detail regarding the level of nutrition provided by the OPTIFAST VLCD products when following 'fluids only' post surgery. It is important to note that OPTIFAST VLCD is not intended to meet nutrient requirements for bariatric surgery patients and that further supplementation to prevent long-term deficiency as highlighted above is still required.

### Stage Two – Smooth puréed foods

After 2–4 weeks it is important to progress from fluids to puréed foods to ensure that real food can be tolerated. This stage generally last between 2–4 weeks.

### Stage Three – Soft diet

Over the coming weeks, the stomach will have stretched a little so soft foods can be introduced. These foods are soft and do not need to be puréed unless they are not easily mashable with a fork.

### Stage Four – Solid food

After about 8–10 weeks, foods of normal consistency need to be introduced, however the quantity will be greatly reduced to that of pre-surgery. General guidelines are for meal size to be entrée size or served up on a bread and butter plate or in the case of some surgeries i.e. LSG or RYBG a small ramekin. Food needs to be chewed very well before swallowing. Drinks such as soft drinks, cordials, sports drinks and full cream milks should be avoided.

Table 5: Nutrient provision of OPTIFAST VLCD products and blood monitoring recommendations<sup>10,11</sup>

	Recommended Daily Intake (RDI)		Average quantity provided by OPTIFAST VLCD		Blood monitoring		
	Female	Male	Per Serve (53g)^	Ave Qty Per 3 Serves (53g x 3)^	2 months post surgery	6 months post surgery	Post yearly
Iron	18 mg	8 mg	8 mg	24 mg	✓	✓	✓
Thiamin (B1)	1.1 mg	1.2 mg	0.58 mg	1.7 mg	✓	✓	✓
Vitamin B12	2.4 µg	2.4 µg	1.1 µg	3.3 µg	✓	✓	✓
Folic Acid	400 µg	400 µg	110 µg	330 µg	✓	✓	✓
Vitamin D	5 µg	5 µg	3.7 µg	11.1 µg	✓	RYGB	RYGB
Calcium	1000 mg	1000 mg	420 mg	1260 mg	✓	✓	✓
Vitamin A	700 µg RE	900 µg RE	345 µg RE	1035 µg RE	✓		
Vitamin E	7 mg TE	10 mg TE	7.4 mg TE	22.2 mg TE	✓	✓	✓
Vitamin K	60 µg	70 µg	31.8 µg	95 µg	✓	✓	✓
Zinc	8 mg	14 mg	4.2 mg	12.6 mg	✓	✓	✓
Copper	1.2 mg	1.7 mg	1.1 mg	3.3 mg	✓	RYGB	RYGB

Information adapted from Mechanick et al., SOARD, 2013<sup>11</sup> and Parrot et al., SOARD, 2017<sup>10</sup>. RYGB – Roux-en-Y Gastric Bypass.

^Nutritional Information based on OPTIFAST VLCD SHAKES.

## Nutritional management of complications post-bariatric surgery

Bariatric surgery may result in complications that require nutrition support. During this time, nutrition goals include nutrition repletion, avoidance of overfeeding, preservation of lean body mass and wound healing. Recent clinical practice guidelines from both the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) and Society of Critical Care Medicine (SCCM) have recommended the use of hypocaloric, high protein nutrition support in both critically and non-critically ill obese patients. Hypocaloric feedings of 50%-70% of estimated energy requirements based on predictive equations or <14kcal/kg actual body weight, as well as high protein feedings of 1.2g/kg actual weight or 2–2.5g/kg ideal body weight, are suggested by A.S.P.E.N. in the 2013 Clinical Guidelines for Nutrition Support of Hospitalized Adult Patients with Obesity.<sup>43</sup> Further research including large randomized clinical studies are needed to validate these findings however based on current evidence, hypocaloric, high protein nutrition support appears to be a useful tool for clinicians to achieve continued weight loss in complicated bariatric surgery patients requiring nutrition support.<sup>43</sup> In instances where this is required, a modified OPTIFAST VLCD Program may offer a suitable nutrition support option for patients with complications post-bariatric surgery.



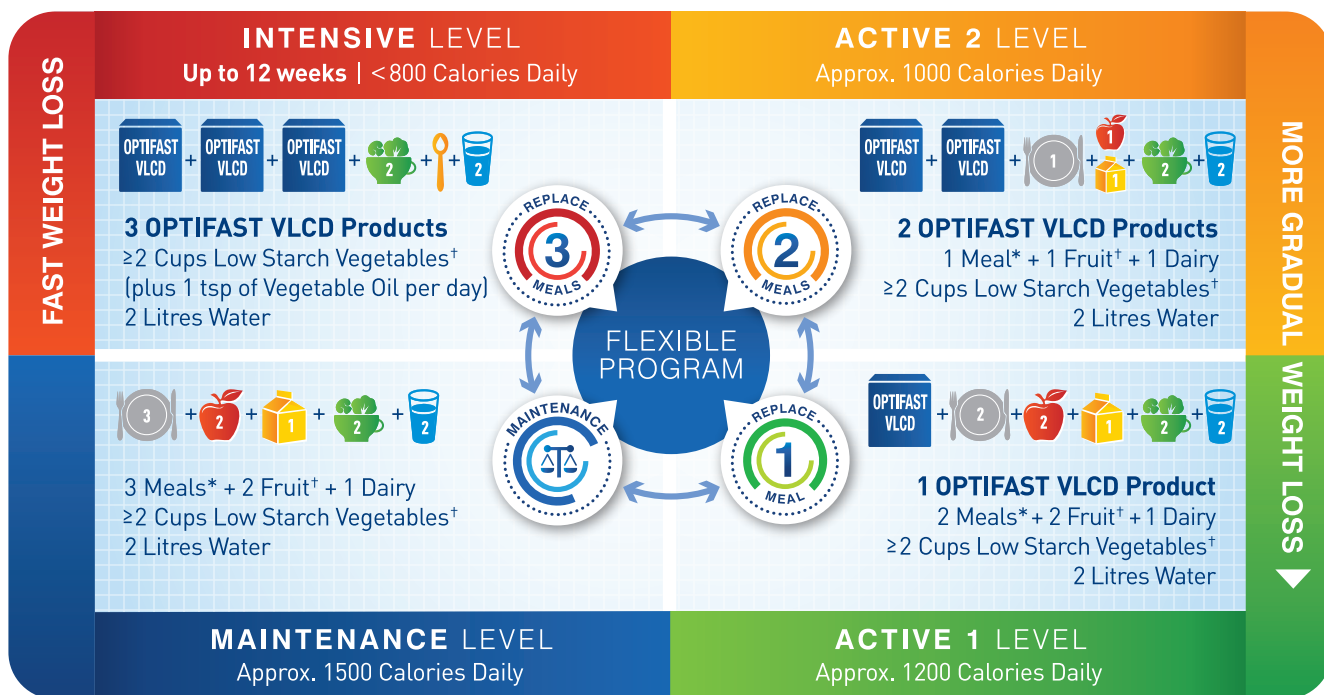
# Maintaining weight loss post-bariatric surgery

Bariatric surgery leads to significant and sustained weight loss,<sup>44</sup> however some weight regain may occur regardless of the bariatric surgical type. Achieving long-term weight loss therefore requires weight management strategies to be continued after bariatric surgery.

The OPTIFAST VLCD Program can be introduced as part of the weight maintenance strategy. A partial Meal Replacement Program (replacing 1–2 meals per day with a meal replacement product) following significant weight loss can effectively and safely produce significant sustainable weight loss.<sup>45</sup>

Alternatively, the Intensive Level of the OPTIFAST VLCD Program can be reintroduced for short periods (eg. 2–6 weeks) as part of a weight maintenance strategy, or where weight gain has occurred.<sup>46,47</sup>

Figure 7: OPTIFAST VLCD Program Levels Overview



The OPTIFAST VLCD Program can be modified to suit individual requirements.

\*Meals should equal approximately 350 calories each.

<sup>†</sup>See allowed low starch vegetables and fruit in the 'Allowed Vegetables and Additional Food Allowances' table ([www.optifast.com.au](http://www.optifast.com.au)).



# 2

## Pre-surgery guidelines



# Pre-surgery weight loss with OPTIFAST VLCD

Whilst the OPTIFAST VLCD Program is predominantly used for pre-bariatric surgery, other types of surgery may also require pre-surgical weight loss. Pre-surgery weight loss in the obese may be recommended for a number of Gastrointestinal and Orthopaedic procedures or for procedures such as urinary incontinence or osteoarthritis of the weight bearing joints.

The benefits of pre-surgical weight loss as outlined in Section 1 of these guidelines still apply for these other types of surgery, especially in relation to reducing hospital stays, increasing recovery time and long-term success of the procedure performed.

Where weight loss is required the OPTIFAST VLCD Program can be utilised as outlined in Section 1, however a longer duration of the Intensive Level i.e. up to 12 weeks, may be recommended to achieve the desired weight loss. In this instance long-term monitoring, support and motivation is crucial and patients should be monitored by both their surgeon and an Accredited Practising Dietitian regularly.

For patients requiring a longer duration of the OPTIFAST VLCD Program, please refer to the *OPTIFAST VLCD Clinical Treatment Protocol* for further management.





# 3

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## OPTIFAST VLCD support



# OPTIFAST VLCD

## online support & member benefits

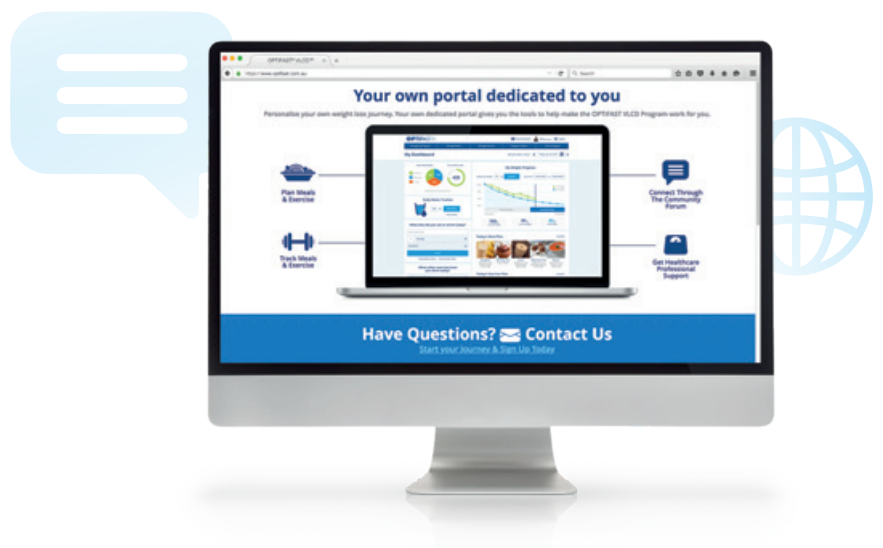
Support is an essential part of any weight loss program. The OPTIFAST VLCD website offers a whole range of benefits to help support you and your patient through a successful weight loss journey pre and post surgery.

Encouraging your patient to become a member of OPTIFAST VLCD online support will give them access to a range of tools and resources that they will be able to use as part of their weight loss journey.

Online support membership is FREE and grants your patient full access to all support tools and information, which includes:

- Tools to help them set up their weight loss goals;
- Ability to develop a personalised OPTIFAST VLCD Program plan, including meal and exercise trackers;
- Review progress over time to see how they are tracking;
- Dietitian-approved, delicious and healthy low-calorie recipes;
- Informative articles and videos from our healthcare professional team;
- Ability to connect with like-minded members for support via the forum.

The OPTIFAST VLCD team appreciate that everyone is different and that no one plan will suit or achieve the desired results for all people. Whilst you, as their healthcare professional are the main point of support, additional support like the OPTIFAST VLCD Community Forum, tracking tools, recipes and resources will only enrich their weight loss experience and increase long-term compliance.



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