Peri-operative nutrition care of bariatric surgery patients

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29th August 2020

SINGAPORE NUTRITION AND DIETETICS ASSOCIATION

Overview

1. Pre-operative nutrition assessment & advice
2. Post-operative nutrition care
3. Monitoring & treatment of nutrition deficiencies before & after BS
4. Nutrition considerations after BS

The greatest disease of our time is Obesity

Physical Complications

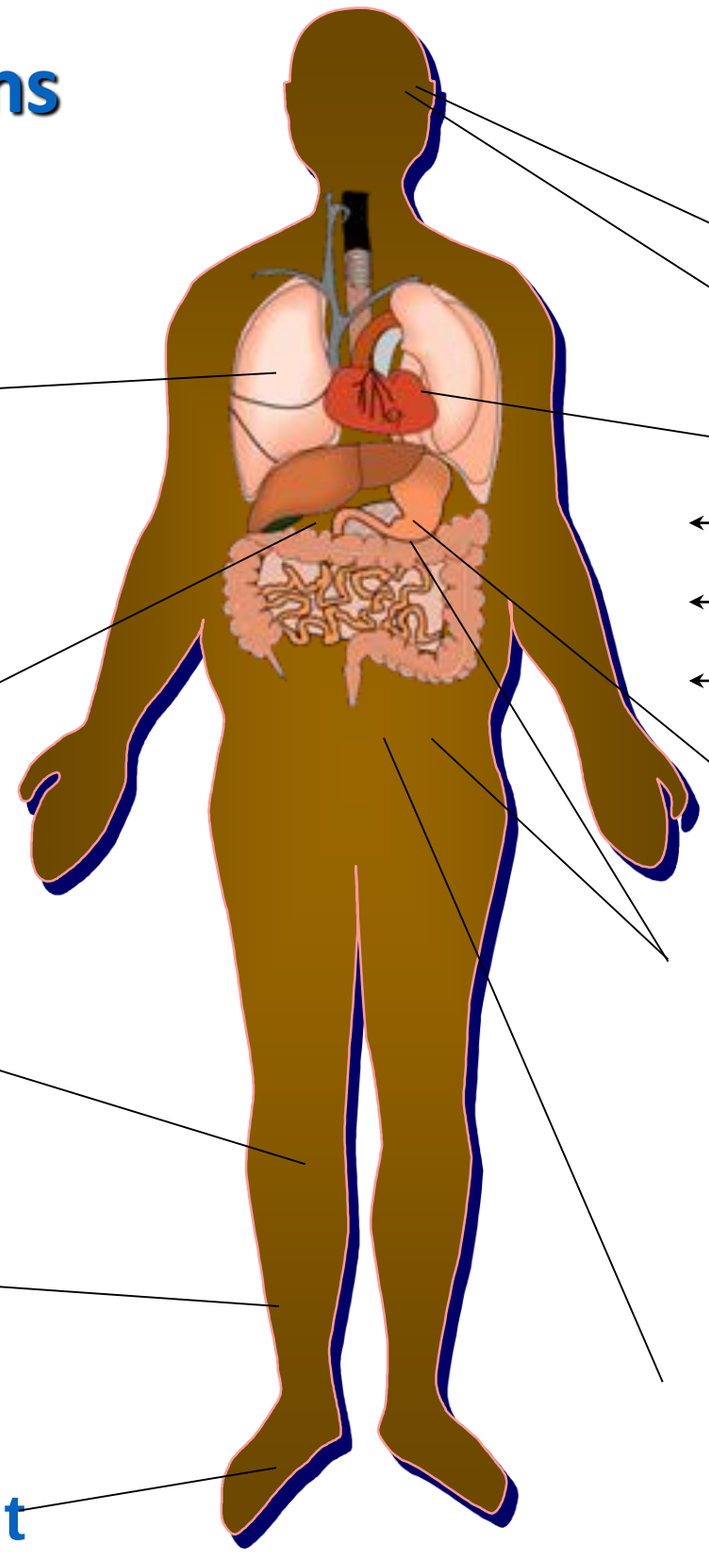
Pulmonary disease
abnormal function
asthma
obstructive sleep apnea
hypoventilation syndrome

Gall bladder disease

Osteoarthritis
Joint pains

Venous stasis
Phlebitis
Leg swelling
Ulcers

Gout



Medical (or Metabolic) Complications

Stroke

Cataracts

Coronary heart disease

Diabetes

Dyslipidemia

Hypertension

Fatty liver

Cancer
breast, uterus, cervix
colon, esophagus, pancreas
kidney, prostate

Gynecologic abnormalities
abnormal menses
infertility
polycystic ovarian syndrome

Cochrane Database of Systematic Reviews, Issue 2, 2009

Surgery for obesity

Jill L Colquitt, Joanna Picot, Emma Loveman, Andrew J Clegg
Southampton Health Technology Assessments Centre, University of Southampton, Southampton, UK

- Surgery results in greater weight loss than conventional treatment in people with BMI greater than 30 as well as those with more severe obesity

- Surgery also leads to some improvements in quality of life & obesity related diseases such as hypertension & diabetes

OBESITY

HPB-MOH Clinical Practice Guidelines 1/2016


Academy of Medicine, Singapore


College of Family Physicians, Singapore

Endocrine and Metabolic Society of Singapore

Ministry of Health, Singapore


Obesity & Metabolic Surgery Society of Singapore


Obstetrical & Gynaecological Society of Singapore


Singapore Association for the Study of Obesity


Singapore Nutrition and Dietetics Association

Singapore Paediatric Society


Sports Medicine Association, Singapore

June 2016

Treatment: Surgical and related options

C Bariatric surgery should be part of a programme of care delivered by a multi-disciplinary team including surgeons, dietitians, nurses, psychologists, physicians and physical therapists. It should only be carried out in institutions where a full range of facilities and services are available 24 hours a day. These include (but are not limited to): specialist medical and nursing staff, access to operating rooms and intensive care units and radiology service with interventional capability. **(pg 71)**

Grade C, Level 2⁺

A Patients with BMI above 40 kg/m², or above 35 kg/m² with at least one obesity-related comorbidity, especially if difficult to control with lifestyle and pharmacological therapy, may be considered for bariatric surgery as a medical treatment.* **(pg 73)**

Grade A, Level 1⁺

B A bariatric procedure should only be offered after extensive work-up and discussions with the relevant stakeholders. **(pg 74)**

Grade B, Level 2⁺⁺

A Patients with Type 2 diabetes mellitus and other medical comorbidities should be followed up by appropriate physicians according to the usual protocols for management of the respective conditions. **(pg 75)**

Grade A, Level 1⁺⁺

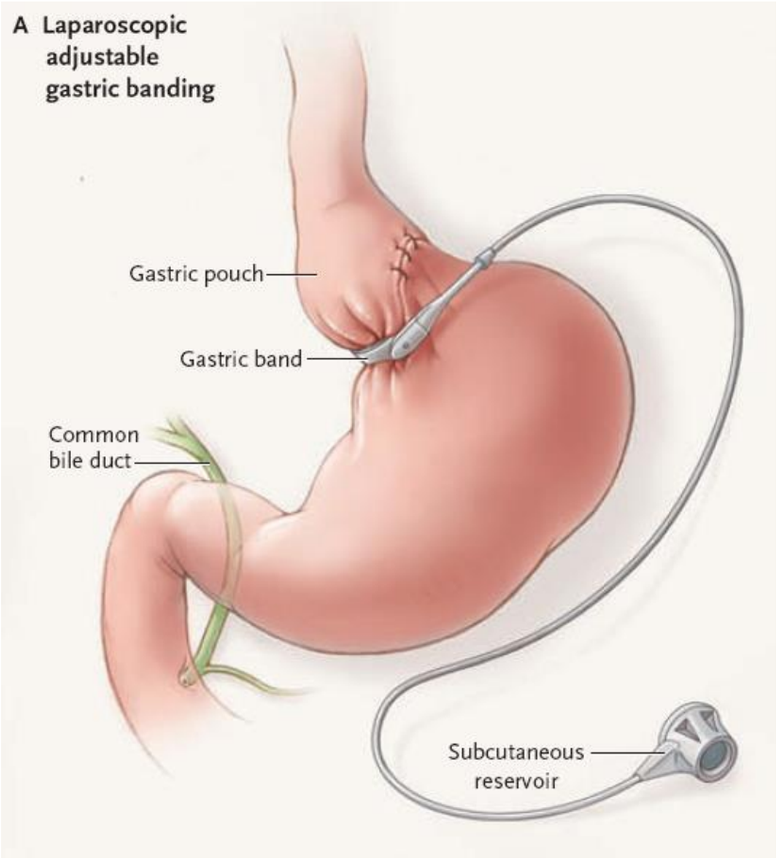
C Lifelong follow-up by a multi-disciplinary team is mandatory for patients who undergo bariatric surgery. **(pg 76)**

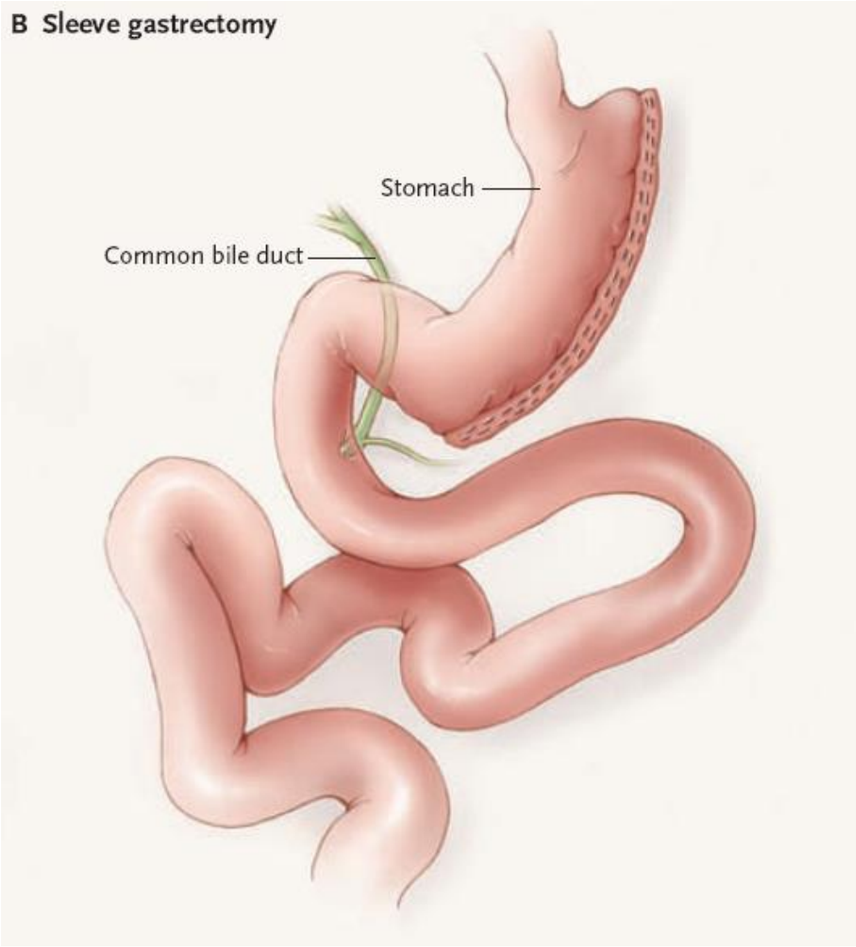
Grade C, Level 2⁺

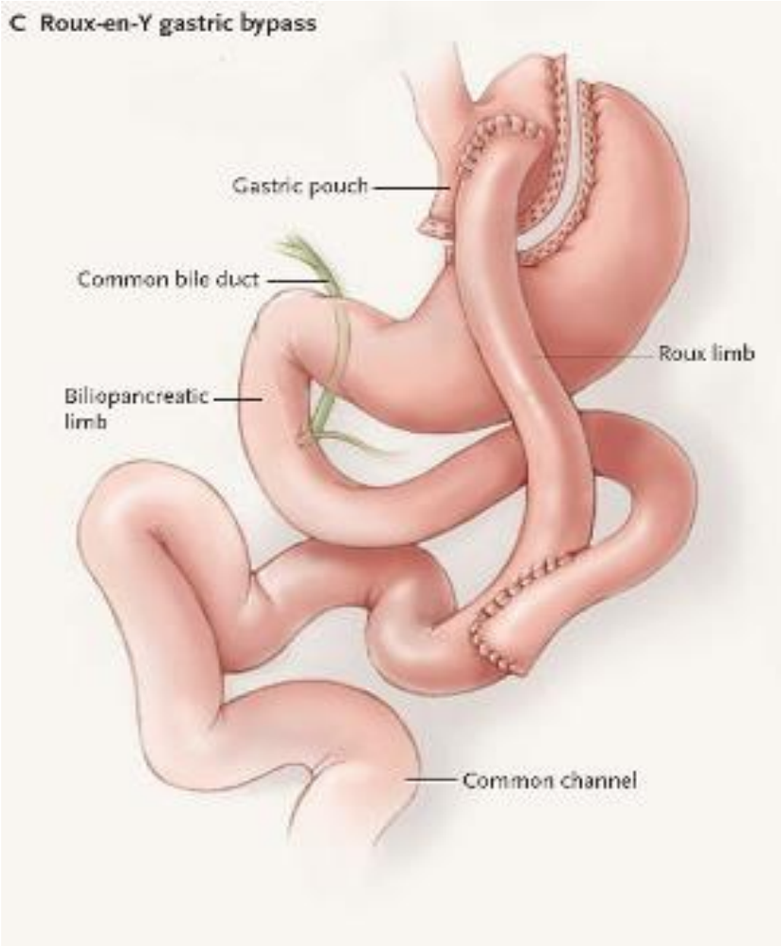
B Regular laboratory tests should be made available to monitor nutritional deficiencies. Regular supplementation is mandatory following bariatric procedures with a malabsorptive component. **(pg 77)**

Grade B, Level 2⁺⁺

Weight-loss surgery options:







Challenge #1:

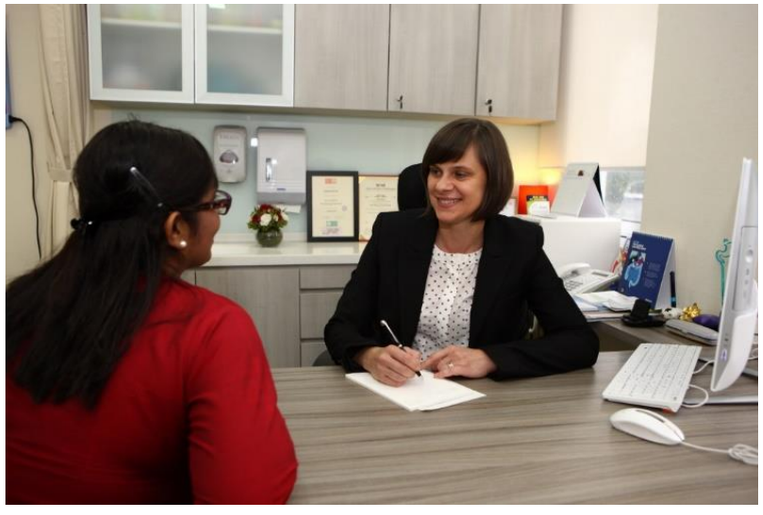
Bariatric surgery may send the ‘wrong’ message regarding the importance of needed lifestyle changes and too many patients consider it a

‘quick fix’

Dietitian's role….

- Dietitians are integral members of the interdisciplinary care – **experience** is key.

- Nutrition assessment & dietary management has been shown to correlate with success.



AACE/TOS/ASMBS/OMA/ASA Clinical Practice Guidelines for the Perioperative Nutritional, Metabolic, and Nonsurgical Support of the Bariatric Surgery Patient – 2020 Update

ELSEVIER

SURGERY FOR OBESITY AND RELATED DISEASES

Surgery for Obesity and Related Diseases 16 (2020) 175–247

Guidelines

Clinical practice guidelines for the perioperative nutrition, metabolic, and nonsurgical support of patients undergoing bariatric procedures – 2019 update: cosponsored by American Association of Clinical Endocrinologists/American College of Endocrinology, The Obesity Society, American Society for Metabolic & Bariatric Surgery, Obesity Medicine Association, and American Society of Anesthesiologists

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DOI: 10.1111/obr.13087

BARIATRIC SURGERY

OBESITY Reviews WILEY

British Obesity and Metabolic Surgery Society Guidelines on perioperative and postoperative biochemical monitoring and micronutrient replacement for patients undergoing bariatric surgery—2020 update

Mary O'Kane[1] | Helen M. Parretti[2] | Jonathan Pinkney[3,4] | Richard Welbourn[5] | Carly A. Hughes[2,6] | Jessica Mok[7] | Nerissa Walker[8] | Denise Thomas[9] | Jennifer Devin[10] | Karen D. Coulman[11,12] | Gail Pinnock[13] | Rachel L. Batterham[7,14,15] | Kamal K. Mahawar[16] | Manisha Sharma[17] | Alex I. Blakemore[18,19] | Iris McMillan[20] | Julian H. Barth[21]

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[2] Norwich Medical School, University of East Anglia, Norwich, UK
[3] Faculty of Health and Human Sciences,

Summary

Bariatric surgery is recognized as the most clinically and cost-effective treatment for people with severe and complex obesity. Many people presenting for surgery have

Before surgery….

- Initial assessment of diet, nutritional status, weight history, exercise habits, eating behaviours / attitudes & beliefs, psychosocial factors

- Provide individualised nutritional supplementation, support & guidance

- Identify any barriers to success

- Pre-operative diet plan

- Manage surgical expectations

What to look for and aim to counsel on

- *Grazing patterns – i.e. Meal timing;*
- *Skipping of meals (? Sleep and eating pattern);*
- *Binge Eating;*
- *Night time eating patterns;*
- *Eating speed;*
- *Eating distractions;*
- *Drinking and eating with meals;*
- *Weekly patterns;*
- *Small serves but BIG Calories OR big portions;*
- *Food preferences (Sweet tooth).*

Ails, Blackenship, Buffington, Furtado & Parrott, 2008, p.S73

Recommended blood tests…

Recommended	OPTIONAL
FBE	TFT's (Optional)
U&E	Homocysteine (optional)
LFT's	PTH (optional)
Calcium, magnesium, phosphate	Vit A (optional)
Vit B12 (active),	Selenium, iodine (optional)
Thiamine	
Folate (red cell folate)	
Iron studies	
Vit D, Zinc	
Fasting BGL,	
Fasting insulin	
Fasting lipid studies	
HbA1C	

Correction of pre-operative deficiencies to individualised following standard supplemental protocols to meet 100% Nutrient Reference Values

Nutrients at Risk Pre-surgery

Vitamin D	- Deficiency in 23 – 80% of patients (using 50nmol/L cut-off) - Dilution by increased body fat composition, > 50% reduced bioavailability. - Reduced sun exposure.
Iron	- Deficiency in 5 - 29% of patients - Inflammation associated with obesity linked with lower iron absorption in the intestine.
Zinc	- Deficiency in 12 - 32% of patients - Hyperinsulinaemia is associated with excessive excretion of urinary zinc.
Vitamin B12	- Deficiency in 18% of patients
Thiamine	- Deficiency in 15-29% of patients
Folate	- Deficiency in up to 5% of patients

Dagan et al, 2017, Aills et al., 2008; Mechanick et al., 2013; Taylor, 2014

Observational Study > Obes Surg. 2019 Jan;29(1):166-171. doi: 10.1007/s11695-018-3494-3.

Nutritional Deficiencies in Severe Obesity: a Multiethnic Asian Cohort

Phong Ching Lee [1], Sonali Ganguly [2], John B Dixon [3], Hong Chang Tan [2], Chin Hong Lim [4], Kwang Wei Tham [2]

Affiliations + expand

PMID: 30191504 DOI: 10.1007/s11695-018-3494-3

Free article

Abstract

Background: Micronutrient deficiencies are highly prevalent in patients seeking metabolic-bariatric surgery (MBS), although literature remains scant in Asia. In this study, we assess the prevalence of nutritional deficiencies in patients with clinically severe obesity in Singapore and examine factors associated with the deficiencies.

Methods: This is a prospective, observational study of 577 consecutive patients scheduled to undergo MBS. Nutritional profile including renal panel, calcium, phosphate, intact parathyroid hormone (iPTH), 25-hydroxyvitamin D (25(OH)D), vitamin B12, folate, ferritin, iron studies, hemoglobin, albumin, and alkaline phosphatase were analyzed.

Results: Mean age was 40.6 ± 10.3 years, 61.2% female, and mean BMI 42.4 ± 8.4 kg/m^2. 92.9% had suboptimal vitamin D levels; of which 25.6% had vitamin D insufficiency (25(OH)D < 30 mcg/L), 57.5% had vitamin D deficiency (25(OH)D < 20 mcg/L), and 9.8% had severe vitamin D deficiency (25(OH)D < 10 mcg/L). Younger age, female gender, and higher BMI were independent factors associated with lower 25(OH)D. There was an inverse relationship between iPTH and 25(OH)D, with an inflection point at 25(OH)D of approximately 20 mcg/L. Folate deficiency was present in 31% and vitamin B12 deficiency in 9.5% of the cohort. Serum ferritin levels were low in 29.3%. 25(OH)D, ferritin, serum iron, and albumin were also significantly higher in Chinese compared to Malay and Indian patients.

Conclusion: Vitamin D deficiency was the most common micronutrient deficiency observed in this multi-ethnic Asian cohort presenting for MBS. Ethnic differences in nutritional status were observed.

VLCD before surgery

- 500-800 cal diet with adequate vitamins, minerals & protein (0.8 - 1.0g/kg) for 2-3 weeks before surgery to promote:
  - visceral fat loss
  - reduce liver size (15-20%)
  - minimize surgical risks (↓ time)
- Adjust diabetic & blood pressure meds

Obes Surg. 2020 Jun;30(6):2099-2107. doi: 10.1007/s11695-020-04446-y.

Preoperative Weight Loss via Very Low Caloric Diet (VLCD) and Its Effect on Outcomes After Bariatric Surgery

Sarah Ying Tse Tan [1], Pooi Ling Loi [1], Chin Hong Lim [2], Sonali Ganguly [1], Nicholas Syn [3], Kwang Wei Tham [1], Hong Chang Tan [1], Weng Hoong Chan [2], Hui Mei Wong [4], Phong Ching Lee [5]

Affiliations + expand

PMID: 32077058 DOI: 10.1007/s11695-020-04446-y

Abstract

Introduction: The effect of preoperative weight loss via very low caloric diet (VLCD) on long-term weight loss post-bariatric surgery (BS) is conflicting. We analysed its impact on weight loss and other outcomes post-BS.

Methods: Patients (n = 306) who underwent sleeve gastrectomy or gastric bypass from 2008 to 2018 were studied. VLCD was prescribed for 14 days preoperatively. Patients were followed up for 5 years. Postoperative weight loss was compared in patients with preoperative weight gain or weight loss < 5% (WL < 5%), and weight loss ≥ 5% (WL ≥ 5%). Preoperative WL compared weight before and after VLCD; postoperative WL compared post-VLCD weight and follow-up weight. Total weight loss (TWL) encompassed pre- and postoperative WL.

Results: WL was < 5% in 87.3% and ≥ 5% in 12.7%. There was no significant difference in complication rate, duration of surgery or length of stay, regardless of surgical type. Patients with WL < 5% lost more weight postoperatively compared with WL ≥ 5% for up to 60 months (%postoperative WL at 1 month: WL < 5% = 13.7%, WL ≥ 5% = 10%, p = <0.001; 60 months: WL < 5% = 30.6%, WL ≥ 5% = 23.9%, p = 0.041). However, when TWL and percentage of excess body mass index loss (%EBMIL) were measured, there was no difference beyond 6 months. A predictive multivariable model for 1-year %EBMIL was formed. Significant variables included pre-VLCD BMI and preoperative WL, and the relationship between the two.

Conclusion: Preoperative WL via VLCD was associated with reduced postoperative WL after BS, with no significant effect on complications, long-term TWL or %EBMIL. This challenges the notion that preoperative WL via VLCD should be mandated for better postoperative outcomes.

VLCD cont'd….

- Use meal replacements (shakes, soups, bars)
- 3-5 serves per day to induce ketosis, suppress hunger & preserves lean body mass
- No compromise to immune function or wound healing and few side effects. (*Colles et al., 2006*)
- Allowed vegetables up to 5 servings per day or 2.5 cups per day
- Daily tsp of oil recommended to optimise gall bladder function

Example of VLCD meal plan before surgery

Breakfast

VLCD shake

Snack

Veggie Sticks

Lunch

Bowl of salad
VLCD shake

Snack

Apple

Dinner

VLCD soup
Stir-fried vegetables

Nutrition after surgery….

1. All bariatric procedures require the patient to transition from liquids to solids but no 'standardised' protocol / pathway
2. Each phase must ensure nutrient requirements:
   - match satiation within the texture permitted;
   - support healing and recovery;
   - support the preservation of lean body mass.
3. Lifelong vitamin & mineral supplementation is recommended
4. ASMBS guidelines are great resource to guide practice

Table 2. Common suggested texture progressions (classified by type of surgical procedure)

Texture progression	Weeks after surgery for each texture		
	AGB	SG	RYGB
Fluids	Weeks 1–2	Weeks 1–2	Weeks 1–2
Puree	Weeks 2–4	Weeks 2–4	Weeks 2–4
Soft solids	Weeks 3–4 (optional phase)	Weeks 4–6	Weeks 4–6
Normal solids	Weeks 4–5	Weeks 6–8	Weeks 6–8

Diet progression after surgery

Stage 1:	Immediately post – op Day 1 post op For 7-10days	**Diet:** Liquid diet
Stage 2:	Post - op Day 7-10 post op For 2-4 weeks	**Diet** Puree/ Mashed
Stage 3:	Long term maintenance Week 6 - 8 post-op Long term	**Diet** Solids

Individualised approach

Inpatient review….

- **Day 0: Ice chips, sips of water**
- **Day 1-2: Clear liquids**
- **Day 2-3: Full liquids**
  - small sips as tolerated
  - no straw or carbonated drinks

Clear Feeds	Full feeds
-Water -Coconut water -Clear soup or broth -Diluted apple juice -Herbal / decaf tea/coffee -Protein water -Vegetable juice (eg. V8)	- Shakes (high protein, low CHO fluid) - Strained soup - Low fat/skim milk - Soymilk - Thin milo - Strained porridge. - Drinking yoghurt

Stage 2: Purees / Mashed

- Plain yoghurt (without fruit or nuts)
- Thick soups
- Smoothies
- Tau Huey (beancurd)
- Eggs (poached or soft boiled)
- Steamed fish
- Tofu/silken tofu
- Puree/minced chicken
- Cereals with milk (e.g. oats, weetabix)
- Mashed well cooked vegetables (e.g. pumpkin, potato etc)
- Soft fresh fruit (e.g. banana, ripe papaya)

Don’t drink 15min before and 30min after eating

Sample Meal Plan

Breakfast	up to ½ cup of oatmeal or instant oat porridge or plain yoghurt or soft boiled/poached egg
Morning Tea (optional)	½ cup low fat milk/or unsweetened soybean milk or soft fresh fruit or ½ Optifast
Lunch	up to ½ cup fish/tofu/egg/minced chicken or meat and mashed vegetables or 1 serve of Optifast
Afternoon Tea	½ cup low fat milk/or sugar free soybean milk or plain yoghurt or ½ Optifast
Dinner	up to ½ cup fish/tofu/egg/minced chicken or meat and mashed vegetables or 1 serve of Optifast

Stage 3: Full diet

Eventually you will progress to a normal consistency diet. It is still important to eat slowly and chew food well. Continue to have 3-4 small meals and stop eating when you feel full to prevent over-stretching your small stomach.

- Look out for potential ***problem foods*** e.g.
    - Rice
    - Fresh bread – try toasted until dry
    - Red meat – try poultry, fish, eggs, tofu. Moist dishes might be easier to manage
    - Raw vegetables – try well cooked vegetables
    - Fruit with skin – try peeling the skin and cut fruit into small bites to try stewed fruit. Remove fibrous parts of citrus fruits
    - Biscuits/chips – as these foods are high in fat they should not be part of your diet

Stay in the green zone

Diet related problems following BS

- Dehydration
- Nausea & vomiting
- Reflux
- Regurgitation
- Food intolerances
- Diarrhoea /steatorrhea

- Dumping syndrome
- Loss of appetite/anorexia
- Fear of stretching pouch
- Return of appetite
- Constipation
- Hair loss

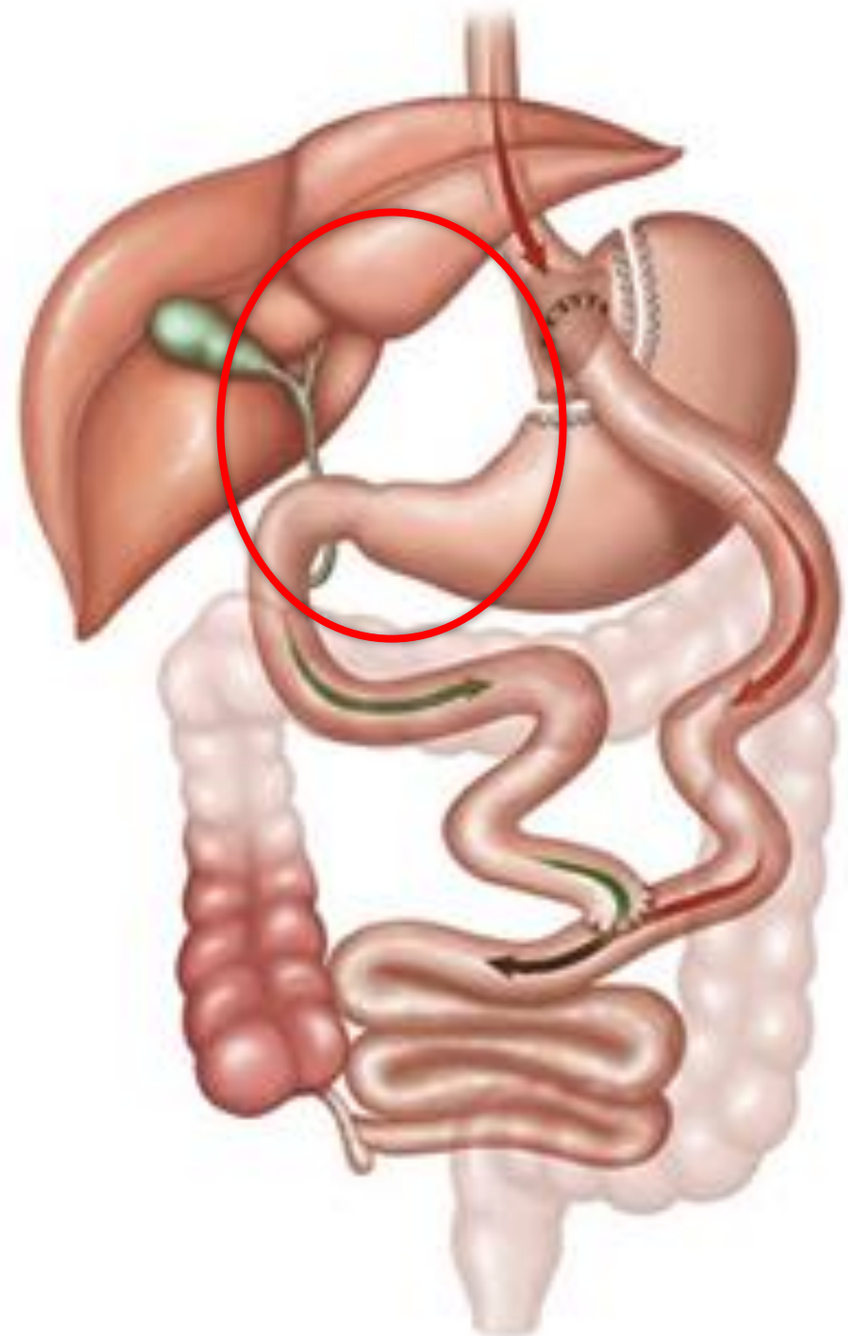
Dumping Syndrome

- **Early dumping –**

– occurs usually within ½ hour after eating
– due to accelerated gastric emptying of hyperosmolar contents into SB
– causes nausea, bloating, cramps & diarrhea;
– most common type 75%.

- **Late dumping** –

– occurs usually 1 -3 hours after eating (high GI carbs)
– due to reactive hypoglycemia and insulin surge causing hypo like symptoms (sweaty, dizzy, nausea, fatigue).



Caroline Shannon
Ashlee Gervasoni
Trudy Williams

Table 4. Common complaints and solutions for gastrointestinal symptoms (classified by type of surgical procedure)

Symptom	Suggested management
Nausea or vomiting	• Recurrent vomiting needs to be addressed urgently, particularly in the first 8 weeks after RYGB and SG surgery, as it may lead to thiamine depletion and dehydration • Vomiting could be a result of stenosis/anastomic stricture following SG or RYGB, generally occurring around 8 weeks post-operatively (previously 10%, now 2% of patients with a good anastomosis) • Long term nausea and vomiting occur after SG and RYGB when stomach capacity is exceeded • Remind the patient not to rush through texture transition phases • Reinforce the need to dramatically reduce total volume consumed at any single time after SG and RYGB • Remind the patient to eat slowly, chew well and keep to recommended portion sizes • Suggest that eating and drinking together are incompatible, especially following SG and RYGB
Regurgitation or bolus food block (different from vomiting and only applies to AGB)	• Reinforce the eating behaviours listed in Table 3 • Recommend follow up with surgeon as band may be too tight and need adjustment (AGB)
Constipation (AGB, RYGB, SG)	• Check that the patient is not confusing reduced frequency/volume of bowel output due to reduced intake with constipation • Encourage adequate fluid (1000–1500 mL/day), high fibre intake (25–30 g/day) and exercise • Recommend fibre supplement to boost intake
Overly decreased appetite (common after RYGB and SG)	• Following SG or RYGB, five or six half volume meals spread over the day are better tolerated and help achieve an adequate protein intake • Low energy, high protein meal replacements or protein supplements may be necessary to meet protein requirements • Avoid unplanned snacking or 'grazing' behaviours, especially on 'poor quality' foods
Dumping syndrome (not common after AGB)	• More common after RYGB, SG • Encourage adequate protein and low glycaemic index carbohydrate foods • Remind patient to separate fluid and foods • Discourage highly refined and processed sugar foods and drinks
Diarrhoea	• Review dumping syndrome management • Consider that it may be a transient post-operative event • Add soluble fibre in some circumstances

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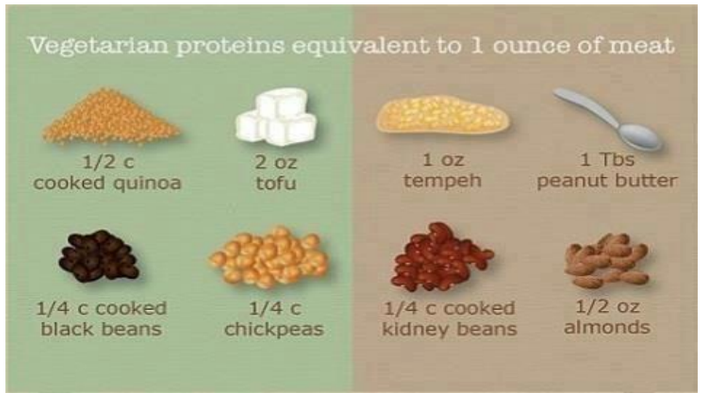
Table 3. Eating behaviours to encourage (classified by type of surgical procedure)

Eating behaviour	Explanation	Practical tip
Eat regular meals – avoid skipping meals	Due to the very small gastric volume, skipping meals results in inadequate nutrition, especially protein, as patients cannot eat more to compensate at the next meal (SG, RYGB) Going for long periods of time without food can result in nausea and hunger, therefore patients can be more likely to eat too fast or too much at the next meal, resulting in adverse side effects (AGB, RYGB, SG)	Plan meals ahead of time so appropriate choices are made Cook in bulk and freeze meals
Consume smaller amounts	Satiety is achieved with smaller serves but external tools/ reminders may be needed to reduce over-serving (AGB, RYGB, SG)	Serve onto small side plates and child-sized bowls to moderate volume Use toddler-sized cutlery to reduce bite-volume and eating pace
Cut food into small pieces	Small cut-size aids the thorough mastication of food (AGB) and gives perception of more food (AGB, RYGB, SG)	Use small utensils to pick up smaller amounts of food
Chew well	Poor mastication increases risk of blockages (AGB) and fast eating (AGB, RYGB, SG)	Use the tongue to feel for remaining food lumps before swallowing
Eat slowly	Fast eating increases the risk of overeating (AGB, RYGB, SG), pain and regurgitation (AGB)	Wait at least 30 seconds between each swallow (AGB) Aim to make a meal last 20–30 minutes, but no longer than an hour
Avoid distraction when eating – practise mindful eating	Distracted eating is linked to overconsumption and poor food appreciation (AGB, RYGB, SG)	Make eating a pure behaviour by removing external stimuli such as the TV, computer and work
Avoid eating and drinking at the same time	If the patient is not diligent in allowing enough time between swallows, drinking and eating together may wash inadequately chewed food into the stomach and contribute to pain, regurgitation or blockage (AGB) The stomach capacity is small and fluids may displace capacity for solid foods (SG, RYGB) or contribute to dumping syndrome (SG, RYGB)	Do not place drinking vessels at the dining area Set a timer as a reminder to commence/ cease drinking Carry a sipper bottle of water

Challenge #2
Meeting protein requirements…….

- Eat protein foods first & chose good quality
- Aim for 60 – 120g protein per day (including 10g leucine).
- Helps induce satiety, stimulate weight loss, maintain FFM, regulate BGL's & decrease TG levels.
- CHO also necessary to help prevent muscle loss >100g per day
- Supplements (whey based preferably) will be necessary to meet these requirements in the early post-operative period.
- Loss of 17% LMB in 1st year post BS



ASMBS 2017 Post BS Micronutrient Supplementation Recommendations

	LAGB	LSG	RYGB
Thiamine	12mg, preferably 50mg	12mg, preferably 50mg	12mg, preferably 50mg
Vit B12	350 – 500ug orally/sublingual or 1000mcg monthly parental	350 – 500ug orally/sublingual or 1000mcg monthly parental	350 – 500ug orally/sublingual or 1000mcg monthly parental
Iron	18mg or 45 – 60mg if menstruating female	45 – 60mg	45 – 60mg
Zinc	RDI 8 - 11mg/day	RDI 8 – 11mg	200% RDI 8 – 22mg
Copper	RDI 1mg	RDI 1mg	200% RDI 2mg
Vit A	5000IU	5000 – 10,000IU	5000 – 10,000IU

Jeffrey I. Mechanick et al. / Surgery for Obesity and Related Diseases 16 (2020) 175–247

Folate	400 – 800ug (800 – 1000ug child bearing age)	400 – 800ug (800 – 1000ug child bearing age)	400 – 800ug (800 – 1000ug child bearing age)
Vit E		15mg	15mg
Vit K	90 – 120mg	90 – 120mg	90 – 120mg
Calcium	1200 – 1500mg Divided doses/preferably citrate	1200 – 1500mg Divided doses/preferably citrate	1200 – 1500mg Divided doses/preferably citrate
Vit D	3000IU or more to keep Vit D levels >30ng/mL (75nmml/L)	3000IU or more to keep Vit D levels >30ng/mL (75nmol/L)	3000IU or more to keep Vit D levels >30ng/mL (75nmol/L)

Challenge #3:
How do we meet these guidelines?

100% RDI + Calcium + Vitamin D + Iron

Table 1. Biochemical parameters and suggested monitoring frequency classified by type of surgical procedure[3]

Nutrient marker	Pre-operative	Post-operative at 6 months	Annual*
Iron studies	AGB, SG, RYGB	RYGB 6–12 months AGB, SG optional at 6 months	RYGB, and optional AGB, SG
Vitamin B12 (methylmalonic acid optional)	AGB, SG, RYGB	At 3–6 months if supplemented (AGB, SG, RYGB)	AGB, SG, RYGB
Folic acid (RBC folate, homocystiene)	AGB, SG, RYGB	RYGB 6–12 months AGB, optional SG at 6 months	RYGB, and optional AGB, SG
25-vitamin D	AGB, SG, RYGB	Optional	AGB, SG, RYGB
Vitamin A	AGB (optional), SG, RYGB	RYGB	RYGB every 6–12 months
Vitamin E	AGB (optional), SG, RYGB	Optional	Optional
Zinc	AGB (optional), SG, RYGB	Optional	Optional
Thiamine	AGB (optional), SG, RYGB	Persistent vomiting (SG, RYGB)	Persistent vomiting (SG, RYGB)
Parathyroid hormone	Optional	Optional	Optional
Magnesium	–	Optional	Optional
Selenium	–	Optional	RYGB
Copper	–	–	Optional persistent unresolved problems with iron levels

* At least annually but more frequently if clinically indicated

AGB = adjustable gastric band; SG = sleeve gastrectomy; RYGB = Roux-en-Y gastric bypass

Australian Family Physician Vol. 42, No. 8, August 2013, pages 547-553

Treatment of Deficiency

Vitamin D	50,000IU of D2 or D3 once per week for 8 weeks, followed by 1500-2000IU/d to achieve normal concentration
Iron	150-200 mg elemental Fe
Zinc	60mg x 2/d
Vitamin B12	1000-2000mcg/d sublingual B12 injection
Thiamine	IV 500mg/d for 2-3 days IV 250mcg/d for 3-5 days Oral 100mcg/d as needed
Folate	1000mcg folic acid/d

Dagan et al. 2017;8:382-94

“Will I lose my hair?"

- 3 –6 months post surgery predominately LSG and RYGB.
- Transient & temporary due to big stress on the body
- **NOT nutritional in nature.**
- Adequate protein, iron, VitB12 & zinc intake (diet + supplements).
- No evidence that using ‘hair, skin & nails’ formula’s are effective
  - High in Zn & may interfere with Cu absorption:
- Biotin probably not effective but safe.

Hair Loss beyond 1 year post BS

Review quality of diet:

- Iron insufficiency/deficiency number one suspect.
- Inadequate protein intake (>60g necessary post BS).
- Zinc insufficiency/deficiency (8 –22g/day).
- Other causes to consider: thyroid disease, PCOS / endocrine, dermatology causes.

Barriers to post-operative success

1. Knowledge gaps
2. Physical inactivity
4. Psychosocial factors
5. Maladaptive eating
6. Financial constraints
7. Nutritional noncompliance

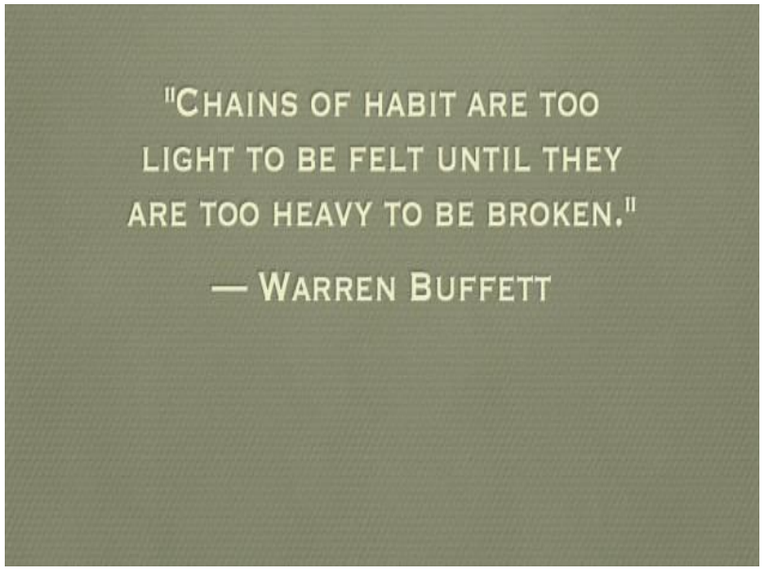
*"1 in 5 patients who undergo bariatric surgery does not lose the **expected** amount of weight; others **regain weight** after the first few years"*

Harvard Medical International (2008)

Obes Surg (2016) 26:1326-1334; Diabetes,Metabolic Syndrome & Obesity: Targets & Therapy (2015) 8:263-273

Eating behaviour - a critical part of a puzzle

- Binge eating
- Grazing/snacking
- Emotional or comfort eating
- Boredom eating
- Food cravings



Pre-surgical eating behaviours & habits may re-emerge over time regardless of type of surgical procedure

“I can eat whatever I want after surgery since I will only be able to manage small portions”

Food choices are as important as portion control

A nutritious diet, independent of weight loss is also necessary for disease prevention

vs

› Endosc Int Open. 2019 Dec;7(12):E1691-E1698. doi: 10.1055/a-1007-1769. Epub 2019 Dec 2.

Bariatric endoscopy procedure type or follow-up: What predicted success at 1 year in 962 obese patients?

Gontrand Lopez-Nava [1], Ravishankar Asokkumar [1 2], Angel Rull [1], Fernandez Corbelle [1 2 3], Lucia Beltran [1], Inmaculada Bautista [1 3]

Affiliations + expand

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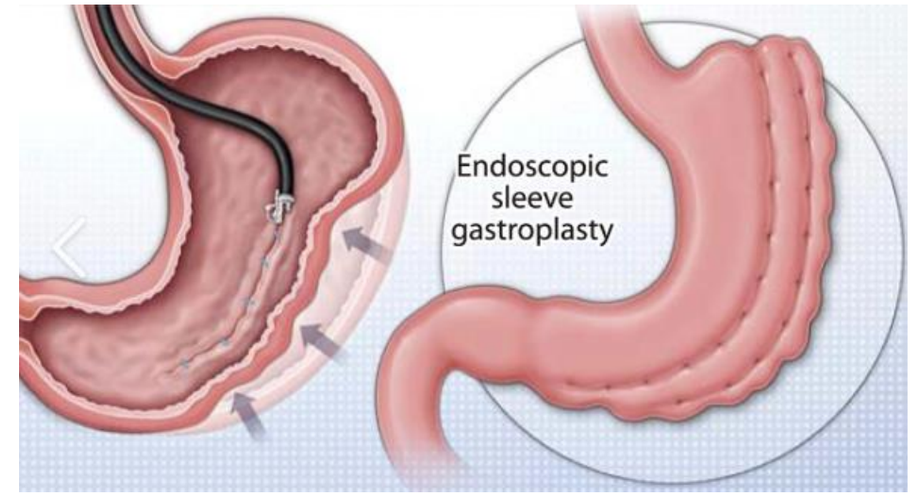
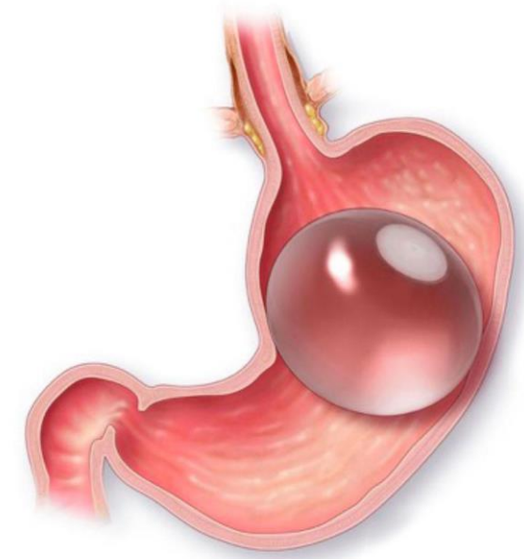


Follow-Up Schedule

Patients were followed-up weekly or biweekly post-procedure by a nutritionist, psychologist, and physiotherapists. When their condition stabilized, we extended the visits to once a month. We recommend achieving 24 clinic visits over 1 year irrespective of the procedure type. The follow-up program comprised dietary instructions, psychological support, physical activity, and a planned counseling schedule, as well as a timeline for future visits.



year. **Conclusions** Weight loss at 1 year is dependent on MDT follow-up rather than procedure type Endoscopic gastroplasty promoted follow-up adherence more than IGBs.

Conclusion

1. Diet, lifestyle and behaviour change are necessary for long-term success after BS

2. Surgery is not the end of the journey with obesity but rather the beginning of a new & sometimes challenging path

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