

Bariatric endoscopic procedures & metabolic surgery

Frequently asked questions

Answered by: Dr Georgia Rigas & Dr Adrian Sartoretto

What is the cost to do gastric surgery in Australia? Approximately 12% of all bariatric metabolic surgery in Australia is being carried out in public hospitals, however on closer analysis, only 3% of the total operations carried out were entirely publically funded. The inclusion/ exclusion criteria vary from subtly from site to site. Currently no endoscopic bariatric procedures are being carried out in public hospitals in Australia.

Therefore, the majority of bariatric metabolic surgery is performed within the private hospital setting. Costs vary according to insurance status and type of procedure. If individuals have adequate health insurance coverage then the out of pocket expenses range from \$4000 - 6000 as part of a "package" which should include aftercare from a multidisciplinary team for a finite number of years.

Alternatively, if a patient is uninsured then they could expect to pay \$20,000- \$25,000 (sometimes more if a complication-though infrequent occurs and requires further intervention/ longer hospital stay visit). Given that bariatric metabolic surgery is elective surgery, individuals are often advised to take out adequate private health insurance and to be engaged in active medical management of their health whilst waiting for insurance coverage to become active.

Endoscopic sleeve gastropasty costs approximately \$15,000, often inclusive of finite aftercare and support from a multidisciplinary team.

Should iron/b12 supplementation be IM instead of PO given reduced absorption?

In the case of RYGB, yes, parenteral im Vitamin B12 every 3-6 months, more often if clinically indicated, is preferred over oral to ensure active B12 levels do not fall below therapeutic levels. In LSG patients levels of vitamin B12 may reduce, less likely for LAGB patients. In such cases, oral supplementation is reasonable, but should be monitored and parenteral replacement given if there is an inadequate response to oral replacement therapy or if compliance is low.

Bariatric surgery certainly has a short term benefit, but I agree longitudinally there needs ongoing support.

Bariatric metabolic surgery helps individuals reduce their food portions often due to reported 'reduced hunger' (earlier satiation and prolonged satiety) as the operations work more physiologically than mechanically – especially beyond the short term.

I think what you're referring to is "the honeymoon" period; the hormonal effects of metabolic surgery are strongest/most pronounced during the first few years; they then become attenuated over time. The purpose of intensive integrated health care team



education and support is to help "enable" patients to make and adopt the necessary healthy lifestyle habits ...whilst the hormonal effects are at their strongest. Think of surgery as an enabler, definitely not a cure for obesity.

Georgia: Let's not forget that obesity is a chronic progressive disease. Weight regain is not a sign of patient or procedure 'failure' but a characteristic of the natural course of the disease. Weight regain is normal and should be expected by the patient and anticipated by the integrated health care team. When it happens, rather than feel ashamed and disengage, the patient should quickly engage with their team to best manage the situation. (What I call a "weight management action plan")

With regard to the Endoscopic Sleeve Surgery, does the redundant tissue continue to be actively secreting? Is there a risk of pseudo-cysts? The oversewn stomach remains functional in all senses- it continues to secrete acid and intrinsic factor (and others) and maintains motility. Because the oversewn compartment is not completely sealed off from the main "lumen", gastric juices pass out without any apparent issue, and there have been no reported cases of pseudo cyst formation in the literature or our clinical experience.

Does the reduced stomach regain normal size over time post-surgery? As discussed in this webinar, except for the gastric band, the other bariatric metabolic operations work via physiology (i.e. trying to overcome the body's hormonal response to weight loss). Whilst the stomach does stretch with time there is nothing in the literature to suggest that it will regrow to its pre-surgical volume. In the case of the sleeve gastrectomy, the conduit might be approximately 150mL in capacity in the first year post surgery; however a few years later the literature suggests the conduit may be approximately 300mL in capacity.

With respect to the gastric bypass operation, the original proximal gastric pouch often will have a capacity of 20-30mL and over time this may increase to 50-60mL. For this reason, some surgeon at the time of surgery, place a silastic ring around the proximal pouch as the current medium-term literature suggests by doing so, there is less weight regain down the track; however this is offset against an increase in some food intolerances. Let's not forget that at baseline the preoperative stomach has a capacity of 1000mL+.

What are the possible complications 10 - 40 years post op of sleeve surgery? Before answering this Q, it is important to consider and balance the complications of bariatric metabolic surgery against the expected social, economic and medical complications the same patient would experience if they did not have bariatric metabolic surgery. PriceWaterhouseCoopers has published a great resource, "Weighing up the cost of obesity-a call to action" October 2015 which speaks to this further.

The sleeve gastrectomy has only been a stand-alone operation for approximately 15 years. Based on the literature and current experience thus far, approximately 25-33% of patients may experience GORD. If this is not adequately treated, there is a slight increased risk of developing Barrett's oesophagus; which has been observed in approximately 15% of patients at 3 years post-surgery. Clearly the risk here is of gastric malignancy, and so PPIs and surveillance are warranted.



Whilst we have known for years that patients who undergo the gastric bypass operation have an increased risk of metabolic bone disease (osteopenia/osteoporosis) due to micronutrient malabsorption (including calcium) and hence why the international guidelines recommend a baseline DEXA scan and that this be repeated every 3-5 years depending on the individual circumstances. There is now emerging data suggesting that the sleeve gastrectomy may also induce similar changes, however the data is still maturing. Therefore it is recommended in such sleeve gastrectomy patients that an individual osteopenia risk assessment be performed, with a low threshold to performing a bone DEXA scan.

What is the complication rate of dumping or reflex vomiting? Firstly, let's put things into context; it is important to note that dumping syndrome is normal and experienced by everyone after a big feast/celebration eg Christmas, Easter etc. Reported rates of dumping syndrome vary in the literature; say approximately 20-25% gastric bypass patient & say 10-15% sleeve gastrectomy patient. Gastric dumping is a feeling of "unwellness" as a result of high osmotic load travelling through gut. It often occurs as a result of consuming high GI +/- fatty foods. Symptoms can include: facial flushing, nausea, palpitations, abdominal cramps, diarrhoea, feeling tired/washed out +/- requiring to rest. These symptoms usually resolve within 15-30 minutes. Classic culinary culprits include Pavlova, KFC etc. Some perceive this as "aversion therapy" ...If a patient develops dumping syndrome, educate them about avoiding high risk foods and reassure them that this is as a result of the hormonal effects of surgery, and that this effect becomes attenuated with time.

Reflex vomiting is different and mostly occurs after gastric banding (however may occur with intragastric balloons too) and is caused by piling a new bolus of food onto a bouncing bolus in the oesophagus. It is readily treated by advising patients to take small bites of food, thoroughly chewing it well and allowing more time between swallowing mouthfuls.

What percentage of patients are non-compliant with dietary restrictions post op - eating soft but high calorie foods?

Again it is a balance of risks. Apparently only 50% of patients are still taking their statin 1 year after therapy was initiated. What percent of patients are compliant with their glucose-lowering or BP-lowering medications?

This all reinforces the need for patients to understand that weight regain is normal and expected to maximise (rather than minimise) follow-up attendance.

It must be remembered that any intervention: the bariatric metabolic surgeries or the endoscopic procedures are merely a "tool"; patients are still accountable for their food and beverage choices, though with regular support and education from a MDT we can hope to positively influence this. So if a patient is "drinking their calories" (ie consuming liquid calories or highly caloric soft/slender foods) then we need to ask why? The reasons for this are many and is in itself a red flag symptom, ie a reason for patients to return to their bariatric clinic for adequate management.

The term "maladaptive eating" in this context refers to patients "drinking their calories" because solid nutritious food is either painful to consume or not tolerated. Once again this is a red flag symptom and such patients need to be seen ASAP..



Maladaptive eating (except for intragastric balloon and gastric band patients) may also suggest that there are underlying unresolved psychological problems that need to be addressed.

As such, all patients should be encouraged to follow up closely with their dietitian and other members of the integrated health care team. Dietary intake should be regularly monitored to ensure adequate nutrition is attained and to safeguard against this eating pattern, which increases the risk of long term weight regain and the resurgence of poorer health.

Regarding reflex vomiting - I had a young patient who had a sleeve gastrectomy and developed vagally stimulated vomiting unresponsive to treatment including regular Botox injections.

Adrian: This is interesting, not least because the vagus nerve may be divided during the sleeve gastrectomy. I would have thought that, in the absence of stenosis (including functional stenosis), volume reflux/regurgitation would be more likely and would require dietary modification (slower consumption, lesser fluid, thorough chewing, smaller portions etc). If refractory, many would consider revision to gastric bypass surgery given conventional anti-reflux surgery is impossible post LSG.

Georgia: from my clinical experience working in an internationally recognised Bariatric Centre of Excellence for many years, the vagus nerve is only transected during a RYGBP operation. Some gastric branches of the nerve are transected during the sleeve gastrectomy but the vagus nerve itself remains intact. See diagram below:

<https://diagramchartspedia.com/vagus-nerve-stomach-function/vagus-nerve-stomach-function-perforated-peptic-ulcer/>

Manometry and CGM would be worthwhile investigations for such a patient.

What is a HIDA scan? Hepatobiliary IminoDiacetic Acid scan- this is a functional nuclear imaging test of the liver and biliary tree, including the gall bladder.

What is Georgia's 3 legged stool analogy of weight management ?

- 1) hormones of energy regulation ie physiology (affected by some medications and also bariatric metabolic surgery)
- 2) healthy nutritional intake *formerly known as "dieting"*
- 3) physical activity and function *formerly known as "exercise" &*

The wooden seat holding everything together: the right headspace (affected by adequate sleep, stress, psychology etc)

What is DEXA? Dual Xray Absorptiometry- although it is applied to the whole body to assess body composition (bone, lean and fat masses).

Is the benefit of weight loss with bariatric surgery, hormonal changes to maintain reduced weight, vs weight loss with diet and exercise which cause hormonal changes that would increase weight - less leptin / insulin / cck and more hunger hormones Ghrelin/GIP? There

are certainly durable hormonal changes that follow surgery that address reflex changes in appetite and satiety that would otherwise act to counteract weight loss (as seen with diet and exercise alone-see NEJM 2011 article by Sumithran et al). However, given that the hormonal effects of surgery become attenuated with time, and the gastric conduit does stretch with time, some weight regain is inevitable and expected.

Let's not forget the natural course of obesity: chronic progressive lifelong condition, with anticipated periods of relapse and remission and so ongoing education, support and the development of strategies to tackle "non hunger " eating is vital and best offered within in MDT setting.

Whilst the purported reasons for weight regain are many and still only partly understood, it is felt that they include:

- i) the disease being chronic and progressive and
- ii) there being a normally distributed heterogeneity of response amongst patients (as with any intervention for any chronic disease).

Anecdotal correlation between a fizzle and weight regain doesn't prove causation.

If the patient has been a poor responder to ESG, can it be converted to another bariatric operation eg gastric bypass? Conversion to LSG or bypass is possible, after trimming sutures (endoscopically). Depending on the pattern of sutures applied, LSG may be more difficult than gastric bypass. In my practice, I suture using a pattern that can be easily converted to LSG or GBP should it ever be required (after the sutures have been trimmed). The bariatric endoscopist should always be involved/consulted in the preparation for surgical conversion.

How reversible is the ESG? The sutures are able to be cut/trimmed, which may allow restoration of gastric capacity, dependant on the degree of scar tissue formation. For this reason, I prefer to avoid saying it is completely reversible, but it can be functionally reversed if needed (but perhaps incompletely in some cases). Certainly, it is intended as a "one-way" procedure.

Is a diagnosis of Inflammatory bowel disease a contraindication to surgery? The question goes to the activity of IBD. Individuals in deep remission are likely to be able to safely undergo surgery, particularly in UC. However, an individual with active or complex Crohn's Disease would need to be assessed on an individual basis to determine if/when they would be considered suitable for bariatric metabolic surgery.

Is oral contraceptive pill is contraindicated following gastric sleeve surgery? It is not contraindicated although it may be less effective owing to altered GI transit and thus, absorption. Additionally, weight gain is commonly seen with most hormonal methods of contraception, and the effect of the OCP on weight loss or weight maintenance should be considered.

It should be noted that the oral contraception pill is NOT suitable in women who have had gastric bypass or bilio-pancreatic diversion; instead non oral therapies are advised eg IUD

Are intragastric balloons approved post sleeve in weight regaining patients?

Unfortunately, no. Any form of gastric surgery is an absolute contraindication to the use of intragastric balloons, owing to the risk of gastric perforation.

There are rules about access to super for this surgery - many people won't meet the criteria. Need to be life threatening - ie. death or irreversible damage in the next 12mths.

Georgia: Since the first of July 2018, the rules have become more stringent, however still accessible to some patients, and are done directly via the ATO. Obviously, every individual case has to be judged by it's own merits.

See this link:

<https://www.ato.gov.au/Individuals/Super/Accessing-your-super/Early-access-to-your-super/>

What is the relationship of osteopenia & gastric sleeve sx? All patients who undergo bariatric metabolic surgery are advised to take nutritional supplements including calcium. Most conventional surgery (RYGB > LSG - is associated with demineralisation; partly due to caloric restriction and limited calcium intake, but also due to unloading of the axial skeleton by the weight loss itself. A study by Dr Brzowska et al (Obes Rev 2013) compared all three bariatric operations and found loss of bone density was more likely in gastric bypass than sleeve gastrectomy patients, and less likely after gastric banding. Weight bearing induces mineralisation, therefore unloading can be associated with demineralisation, unless accompanied by impact exercise, eg walking or running.

In the endoscopic setting, our DEXA data suggest that demineralisation is much less likely (in fact, improved mineralisation can be seen), possibly owing to the less restrictive nature of these procedures. However the data is still maturing.