Public Bariatric Surgery

A National Framework

October 2020

ANZMOSS & Collaborative Public Bariatric Surgery Taskforce

ANZMOSS
Australian & New Zealand
Metabolic and Obesity Surgery Society

Collaborating organisations:

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NACOS™ National Association of Clinical Obesity Services

THE OBESITY COLLECTIVE

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Executive Summary

Obesity is a chronic progressive disease that leads to physical, psychological, and metabolic health problems. The prevalence of obesity is increasing across the globe and in 2017-18 Australia ranked fifth among OECD countries with over one third (31%) of Australian adults living with obesity (1 p. 1). Despite this increasing prevalence, access to the full suite of effective treatments is limited in Australia, including access to bariatric-metabolic surgery

Bariatric-metabolic surgery (also referred to as bariatric surgery) is a well-established, safe and effective form of obesity treatment with demonstrable meaningful and sustained weight loss over the medium to long term. Bariatric surgery has also been shown to be highly effective in reversing or improving obesity-related risks and complications in patients, especially for type 2 diabetes (2). Research evidence is consistent in supporting the cost-effectiveness of surgery in the treatment of obesity and its complication (3).

Although bariatric-metabolic surgery (bariatric surgery) is one of the most effective methods for treatment of obesity, there remain barriers to access especially in the public hospital setting and access remain inadequate.

Over 90% of all bariatric surgery is currently performed in the private system as access to the public hospital system remains poor, even for those with the greatest need (4 p. 5). In 2015-16 only 950 of approximately 24,000 bariatric surgeries performed in Australia occurred in public hospitals (5). A recent (2017) study suggested only 15 public hospitals from a potential 700 institutions nation-wide formally offered a bariatric-metabolic surgical programme (6). In 2019 the National Bariatric Registry recorded 22 public hospitals with bariatric cases but only 10 of these with significant (>75 per year) case load (7).

This inequity of access to care is concerning. With appropriate considerations, making bariatric surgery available within the public hospital setting can provide life-changing health and wellbeing benefits to those who need it most. Further, there is increasing recognition of bariatric surgery as an early treatment option in the care of diabetes (and other chronic diseases) in both international and emerging Australian-developed guidelines (8). This is becoming the new “standard of care” for such diseases. Australian public hospitals have the opportunity to meet this standard of care through increased provision of bariatric surgery.

The 2017 Public Bariatric Surgery ANZMOSS[1] Summit identified that a National Framework was required to provide clear guidelines to health policy makers, clinical governance boards and health practitioners to enable:

- facilitation of successful implementation of bariatric surgery more widely in Australia’s public hospital system
- standardisation of key care elements such as patient eligibility and prioritisation
- a reduction in variations in preoperative and postoperative care pathways
- development of a sustainable model of care integrated with multimodal treatment of obesity.

This National Framework is the result of expert consensus from the ANZMOSS and Collective Public Bariatric Surgery Taskforce (the Taskforce), involving and endorsed by key stakeholder organisations in the treatment of obesity and bariatric surgery (see Taskforce members and participating organisations in Appendix A). The National Framework has been designed to deliver:

- efficient patient centred care
- sustainable use of resources to cater to the disease burden of obesity in the community
- deliver surgical care to the most appropriate patient populations.

This Framework is complementary to the first National Framework for Clinical Obesity Services in Australia (9), developed by NACOS – a collaborative group of concerned health care professionals, which offers practical guidance on best design, delivery, and access to clinical obesity (or ‘weight management’) services in our health system. It is intended that as these frameworks go forward, surgical pathways of care as outlined in this framework and nationwide obesity services pathways and standards, as developed in the NACOS Framework, will be integrated further.

[1] Australian New Zealand Metabolic and Obesity Surgery Society.

Currently, this National Framework does not include considerations for children and adolescents who may need bariatric services. Additional considerations and guidelines will be developed for paediatric and adolescent bariatric surgery at a later stage.

Bariatric-metabolic surgery

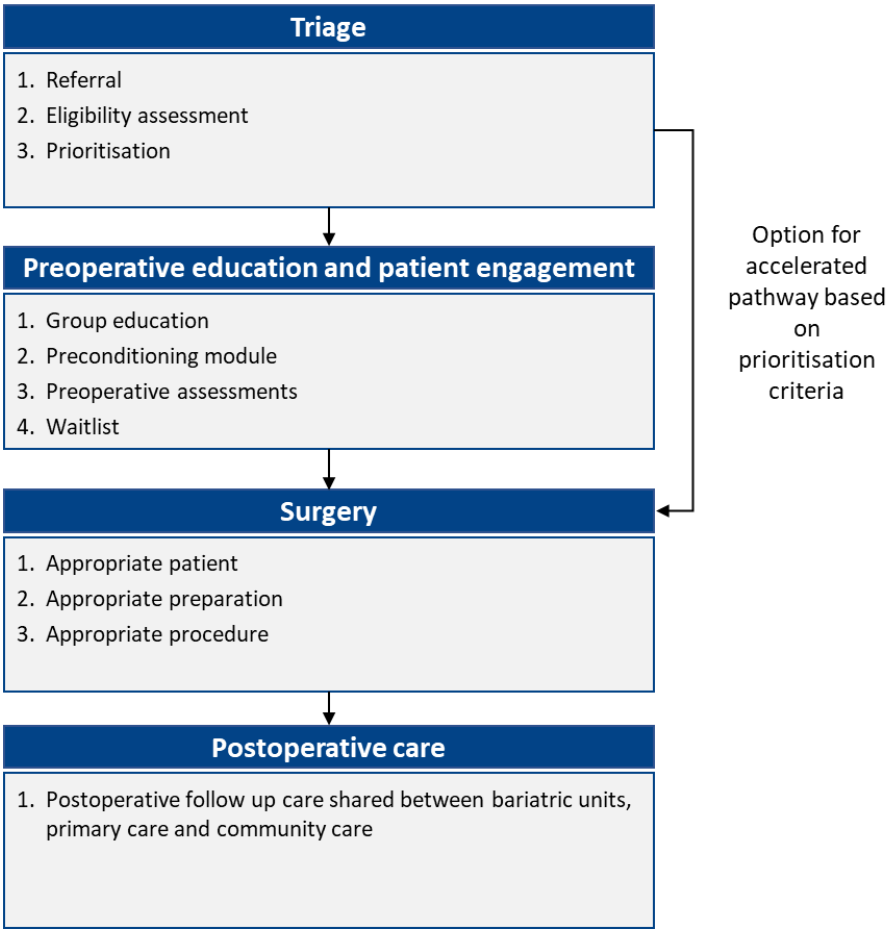
Bariatric-metabolic surgery (also referred to as bariatric surgery) is a well-established, safe and effective form of obesity treatment with, demonstrable meaningful and sustained weight loss over the medium to long term. Bariatric surgery has also been shown to be highly effective in reversing or improving obesity-related risks and complications in patients, especially for type 2 diabetes (2 p. 3).

There are a range of established bariatric procedures that vary in mechanism of action, outcomes, complications and side effects but each has demonstrated efficacy and may have application in different clinical circumstances. Research evidence is consistent in supporting the cost-effectiveness of surgery in the treatment of obesity and its complications. (3 p. 6).

Proposed way forward

In this National Framework, the Taskforce is proposing a carefully considered bariatric surgery service model for the public hospital system to address this unmet clinical need. The service model includes several stages from triage to postoperative care. Working through each stage enables selection of eligible patients that are likely to benefit the most from bariatric surgery. Figure 1 outlines the proposed patient flow for bariatric surgery in the public hospital system.

Figure 1: Proposed patient flow through the public hospital system



Triage (including eligibility and prioritisation)

Eligibility criteria determines whether a patient should or should not receive bariatric surgery in the public hospital system. The Taskforce recommended that eligibility criteria for bariatric surgery in the public hospital system is based on the Edmonton Obesity Scoring System (EOSS). The validated EOSS is a risk stratifying tool that sub-classifies populations living with obesity into five score groups that predict mortality more reliably than BMI alone (10 p. 7). The EOSS stages are summarised as:

- EOSS 0: no associated disease or impairment
- EOSS 1: preclinical disease
- EOSS 2: established disease
- EOSS 3: end organ disease
- EOSS 4: end stage disease.

Further detail on the EOSS is outlined in Section 2.

Using this tool, as well as stratifying by age and BMI, the Taskforce recommended eligibility criteria are summarised in Table 1. It should be noted that the following criteria has been developed cognisant of particular considerations within, and is specific for, the public hospital setting and does *not* seek to define eligibility for bariatric surgery more broadly.

Table 1: National Framework Eligibility Criteria Summary

Qualifying criteria	Contraindications
If the patient in review is: • Aged 18-65, BMI >35-40, EOSS 2-3 **AND** • Documented previous weight loss attempts/treatments • Absence of contraindications (see next column) **OR** • Aged 18-65 years, BMI>40, EOSS 1-3 **AND** • Documented previous weight loss attempts/treatments[2] • Absence of contraindications (see next column) **OR** • Aged 65-70, BMI >40, EOSS 2-3 **AND** • Documented previous weight loss attempts/treatments • Absence of contraindications (see next column) **Diabetes** • BMI>30 – 35 **AND** had T2DM for <10 years or has favourable C – Peptide level [3] which is poorly controlled with medication • BMI > 35 with established diabetes	If the patient in review has any one or more of the following contraindications, they will not be eligible for bariatric surgery: • Medical contraindications to surgery after risk assessment • Alcohol/illicit drug dependence • Untreated severe depression • Untreated DSM-5 eating disorders not managed by an appropriate healthcare professional(s) • Active psychosis.

Smoking is associated with increased operative morbidity as well as longer term complications such as gastric ulceration. Active smokers should be supported to quit over the period leading up to surgery with a view to permanent cessation after the operation.

[2] By GP, dietitian, EP or other HCP

[3] Cost effectiveness typically increases if surgery is performed within five years of diagnosis of T2DM.

Prioritisation is sequential to eligibility. Prioritisation refers to the relative urgency of the bariatric surgery that should take place. Priority for assessment and surgery should be given to patients with significant chronic diseases that are currently not well treated but which are known to respond well to weight loss (11 p. 8). These conditions include:

- diabetes mellitus type 2 (12 p. 10)
- idiopathic intracranial hypertension (13)
- polycystic ovary syndrome and/or obesity related primary infertility (14 p. 11)
- non-alcoholic steatohepatitis
- obstructive sleep apnoea and/or obesity hypoventilation syndrome
- obesity-related cardiomyopathy (15).

With these considerations, further details on the prioritisation criteria for urgent assessment and surgery are outlined in Section 2. Prioritisation will determine whether a cohort of eligible patients should have their pathway to surgery expedited as seen in Figure 1.

Preoperative education and patient engagement

After eligibility and prioritisation criteria have been met, patient education should occur before waiting list assessment. The purpose of patient education is two-fold. Firstly, it allows for the patient to decide if they will proceed with the process and secondly it aims to prepare patients for the process ahead. Education should include information about pre-, peri – and post-operative processes and issues that patients need to consider.

An outline of surgical options noting outcomes, risks and side effects should be provided. Dietary and longer-term eating-habit and lifestyle adjustments required ongoing for optimal outcome should be outlined as well as reasonable (average) realistic long-term outcome expectations post-surgery. It is important to incorporate education around fertility, pregnancy and appropriate contraception in female patients of reproductive age. The format in which the education is provided should be decided by the local bariatric surgical service. It could include group education, a patient-conducted or physician-led preconditioning education program and/or personalised education, which could be conducted prior to further clinical assessment. It is recommended that a two-step education and engagement process be offered to allow adequate time for patients to consider if they wish to proceed with surgery.

After the pre-operative education, the Taskforce recommends that patients are assessed from a medical, surgical, nutritional and psychosocial perspective to guide patient management. If at any pre-operative stage the patient decides not, or is deemed unsuitable, to proceed with bariatric surgery, it is essential that alternative care and treatment of obesity is supported by either referral or provision of information to the patient (and referring clinician) for management of obesity via non-surgical means.

Surgery

Broadly, the following procedures are well established and recognised bariatric-metabolic surgery options suitable for a public hospital service:

1. mechanical, including adjustable gastric banding (LAGB) (16 p. 45)
2. combined mechanical and metabolic, including sleeve gastrectomy (SG), *Roux-en-Y* gastric bypass (RYGB), mini gastric bypass - one anastomosis bypass (MGB - OAGB).
3. combined mechanical, metabolic and malabsorptive, including biliopancreatic diversion (BPD) and duodenal switch (DS).

Several technical variations of these procedures exist and may be appropriate in particular circumstances or trial / research settings. It is likely that with time, these and other procedures may develop or evolve.

Bariatric surgical services should determine the range of procedures to be offered in their program according to expertise and facilities available. Patients should be educated on all available procedures and where a procedure is not offered by the service but deemed more appropriate for the individual after clinical assessment, referral to a linked or networked service providing the procedure is appropriate.

Surgery should be performed by appropriately trained surgeons who are hospital accredited for bariatric surgery.

Postoperative care

Postoperative care is critical to ensure patient outcomes are maintained and further improved post-bariatric surgery. The Taskforce recommends that surgical services develop standardised perioperative and postoperative care pathways based on local expertise, approaches and resources to limit variation in care and provide a template for treating teams of "expected course of patients" (17 p. 12).

The National Framework recommends that at a minimum, the following postoperative follow up points are adopted, noting that the recommended time frames may vary by procedure, institutional experience and available resources:

1. postoperative recovery check (e.g. 2 weeks)
2. early dietitian review (e.g. 2 to 8 weeks)
3. clinical review (e.g. 3 and 6 months, then 6 monthly to two years)
4. dietetic review (e.g. 3 to 6 months, and annual review thereafter).

In addition to monitoring of weight, clinical review should incorporate review, monitoring and management of obesity related complications (such as diabetes, sleep apnoea etc.), medication adjustment, compliance with prescribed nutritional supplements and appropriate psychological support where required. Additionally, advice, education and provision of access to exercise programs should be facilitated. Metabolic and nutritional blood screening at least annually to monitor physiological health and nutritional safety should be conducted, more often if clinically indicated.

Follow up care may be delivered in three acceptable models of care:

1. primarily by the surgical service with appropriate input/referral to or collaboration with required medical specialists (e.g. diabetologists, bariatricians)
2. primarily by an allied medical service of bariatricians with appropriate liaison/referral back to surgical service
3. a combined "Metabolic Clinic" with both surgical and medical specialist expertise in the management of obesity. This is an ideal clinic model where expertise and appropriate resources exist.

Regardless of the clinic model adopted, the National Framework encourages incorporation of holistic care in liaison with the patients' primary care providers.

As with other chronic disease shared care models, there needs to be provision for adequately upskilled and supported primary care teams to manage patients, with clear pathways to re-refer patients back to the bariatric unit in a timely manner when clinical "red flags" become apparent. Pathways of "shared care" are to be sought. This is the ideal model for patient-centred care as well as maximising efficient use of public hospital resources.

Revisional surgery

Revisional surgery refers to surgical interventions for patients who have had a previous bariatric procedure. There are several reasons revisional surgery may be required, including the resulting symptoms, side effects and complications of primary surgery and/or amelioration of effect or poor response.

Whilst rates of revisional surgery can vary, the chronic nature of obesity means that some patients will inevitably require revisional surgery. Accordingly, public hospital services offering bariatric surgery must plan for and accommodate a modest rate of revisional surgery which must be balanced against the need for providing adequate opportunity for untreated patients accessing primary surgery. Bariatric surgical services must ensure the indications for revisional surgery are well defined and documented to limit the possibility for unnecessary surgery.

Service model

With the National Framework's proposed end-to-end bariatric surgery service explained above, it is critical to consider how this can be delivered effectively and efficiently in the public hospital setting. Several factors will contribute to a successful service model, including:

- **multidisciplinary team (MDT) composition:** the role of the MDT is to ensure patients receive adequate preparation, education and support, both before, during and after the surgery. MDT members must have the necessary qualifications and skills to adequately address the patient's health care needs
- **referral sources:** public hospital services should be open to community referrals from GPs and other specialists
- **care pathways:** care pathways should be developed based on local context. This will allow for uniformity of care and early detection of variance that may indicate a perioperative problem for bariatric surgery patients

- **health care networking and surgical capacity:** relying on high level tertiary or quaternary institutions to deliver complete bariatric surgical services[4] is likely to be inefficient to meet the burden of disease both in metropolitan areas and in regional areas where incidence of obesity is often greater. It is vital that community hospitals and regional areas are well serviced by local or regional services. Where smaller institutions may appropriately offer lesser acuity services, formal linkages and network relationships should be formed between institutions to offer a complete bariatric surgical service
- **facilities and equipment:** institutions offering bariatric surgical care should have the minimum equipment requirements to support patients, such as wide chairs, scales that weigh above 250 kilograms, appropriately weight-rated ward theatre tables, beds and examination couches, blood pressure cuffs and other equipment.

Hospitals offering a bariatric-metabolic surgery service should educate the wider hospital staff base to ensure patients are treated with respect and without prejudice or stigmatisation which unfortunately is a common experience in the wider community for people with obesity.

This National Framework sets out the details on how the suggested patient flow and service model could work in the public hospital setting in Australia to address this unmet clinical need to treat obesity.

[4] Complete bariatric surgical service refers to the delivery of the full suite of surgical management options including all primary operations, revisional surgery (only for patients who experienced complications with the primary bariatric surgery) and the management of complex complications.

List of ANZMOSS and Collective Public Bariatric Surgery Taskforce recommendations

Table 2: List of ANZMOSS and Collective Public Bariatric Surgery Taskforce recommendations

Recommendation	*Recommendation detail*
Eligibility and prioritisation	
Recommendation 1	The first element of eligibility criteria for accessing bariatric surgery in the Public Hospital System is determined according to: • BMI 35-40 EOSS 2-3 • BMI >40 with EOSS 1-3 • exclusion of patients with EOSS 0 regardless of BMI[5] • exclusion of patients with EOSS 4[6] regardless of BMI with exception of candidates for renal or liver transplant
Recommendation 2	That the following patients by age cohort are considered eligible for bariatric surgery in the public hospital system: • aged 18 – 64 be considered eligible • aged 65 – 70 with significant co-morbid disease and functional impairment (EOSS 2-3) and BMI >40
Recommendation 3	Eligibility criteria for patients seeking bariatric surgery in the public health system requires documented previous attempts at non-surgical therapies without sustained weight loss.
Recommendation 4	That contraindications to bariatric surgery include the traditional contraindications. Active smoking should be ceased prior to surgery and lifelong abstinence should be support post-operatively. All contraindications are listed in Table 1.
Preoperative pathways	
Recommendation 5	All eligible patients to go through preoperative education including group education, a preconditioning education and engagement program and personalised education prior to preoperative assessment.
Recommendation 6	Patients that progress through the group education, preconditioning program and personalised education should be comprehensively assessed from a medical, surgical, nutritional, psychological and social point of view. These assessments guide management and are educative opportunities for the patient.
Surgery	
Recommendation 7	Institutions are encouraged to develop expert and consistent theatre teams to conduct bariatric surgery and appropriate patient care.

[5] It is recognised that as a BMI >40 is approached, it is likely that a patient will have some form of functional impairment and is likely to fall into EOSS score I or greater.

[6] EOSS 4 patients will require assessment by an MDT team to determine whether the end stage disease is palliative prior to exclusion from surgery.

Postoperative care	
Recommendation 8	Surgical services develop standardised postoperative care pathways that consider the procedure undertaken, the probability of complications, patient progress and others involved in postoperative care to provide a template for treating teams.
Revisional surgery	
Recommendation 9	Public hospital services offering revisional bariatric surgery should be guided by the following principles: • the indication for and desired outcome of revision should be clearly elucidated and documented • the proposed outcome should be realistically achievable • institutional or legacy patients should have equal access potential to revisional surgery without positive or negative prejudice and be subject to the same eligibility and prioritisation criteria • priority should be allocated by indication, as below in descending order: – severe side effects and/or complications not adequately managed by other means – metabolic issues including recurrence or insufficient amelioration of disease complications[7] – weight regain or poor weight loss response to primary operation[8] • all patients being considered for revision for control of clinically severe obesity with complications or for further weight loss indications should be discussed in an MDT meeting with both appropriate medical and surgical expertise available and consensus treatment approach adopted • where the indication is for poor weight loss response or weight regain, revisional surgery should only be considered after additional interventions are trialled. Appropriate dietetic, psychological and lifestyle counselling and intervention should be maximised and further surgery only considered if such measures are ineffective. The use of medical/pharmacological adjunctive therapy should also be considered unless contraindicated.
Service model	
Recommendation 10	To effectively and efficiently deliver bariatric surgery services in the public hospital setting, patients should be managed by a MDT which includes the following team member categories: • "Essential" team members who are embedded within the team and are involved in the care of every patient • "Desirable" team members comprising speciality areas where it is ideal that an individual or core group of specialists are nominated for dedicated involvement with the bariatric team and care of the bariatric patient. However, where this is not possible due to institutional logistics, it is acceptable that the bariatric surgical service be supported by appropriately trained staff as part of the general roster of service • "Liaison" team members, which refers to services that are important for complete care but who are reasonably accessed on an as-needed basis in a formal or semiformal arrangement. Each of the speciality services in this category should ideally be available

[7] This requires clinical evaluation and is considered on an individual case-by-case basis

[8] There is no consensus to define this. However, weight loss that falls within parameters of expected predicted average weight loss curves are not indicated for surgery.

	within the institution but at a minimum be accessible through networked services, for instance through a patient's GP.
Recommendation 11	Public bariatric surgical services should be resourced to accept both internal and community referrals. Referrals for either medical, surgical or non-specified obesity care should be triaged, assessed, and then appropriately streamed after eligibility is determined. Referral triage and assessment should be performed as follows: • centrally by a single co-ordinator for medical, surgical and non-specified obesity care • when centrally is not practical, non-centrally by coordinators of closely networked parallel services, for example one surgical triage coordinator and one non-surgical triage coordinator • hospitals offering a public bariatric surgical program should establish relationships with regional unserviced areas to provide access.
Recommendation 12	Localised care pathways should be developed by the surgical team in conjunction with liaison anaesthetics and perioperative care physicians. Medical, nursing and primary care staff should be appropriately trained and familiarised with these care pathways through regular in-servicing and upskilling.
Recommendation 13	Public bariatric services should be guided by the following health care networking principles for service delivery: • institutions and services are formally networked by agreement to provide for a "complete capability" service between them • networked services deliver streamlined care though standardised processes recommended in this National Framework including preoperative assessment, preparation and postoperative care such that patients assessed at any service within the network and cross referred need not undergo reassessment • parameters of "informed consent" processes are standardised between institutions such that patients receive information on all suitable options, including those not offered by the individual institution, and be appropriately referred on as a priority if required. This requires standardised agreements and educational materials between services • streamlining access to specialised services between institutions if required – e.g. interventional radiology • networked institutions meet at least twice annually to audit and optimise service delivery.

Recommendation 14	All institutions offering bariatric surgery comply with the following minimum facility and equipment requirements at any institution providing bariatric surgical care: • wide (armless) chairs that safely accommodate larger patients • ward beds and examination couches weight-rated appropriately • scales that weigh above 250 kilograms and have a wide base • toilets that are not wall suspended and have rails capable of supporting weight above 250 kilograms • operating tables with higher weightings and the ability to be extended to accommodate lateral spread • appropriate surgical instruments (e.g. long-length surgical instruments) • advanced radiology resources including 24-hour interventional radiology services • x-ray and CT equipment that can cope with patients who weigh over 250 kilograms[9] • appropriate equipment for patient transfer • HDU, extended recovery or monitored beds • emergency (out of hours) theatre access • large cuff sphygmomanometers • suitably sized hospital gowns • endoscopy.
Data collection	
Recommendation 15	Collection of at least a minimum unified dataset that outlines which data should be collected for bariatric surgery patients, with the expanded unified dataset as an option to collect more complete data. All public bariatric surgical services must: • contribute to the National Bariatric Surgery Registry (BSR) • maintain a database allowing minimum outcome dataset reports • ideally be able to provide data pertaining to waiting times and process.

[9] If having equipment of this capacity is unsuitable for a particular institution, patients can be referred to another facility in its network with appropriate weight capacity.

1. Introduction and context

Obesity with health impairment is a chronic disease characterised by excess body fatness. The excessive accumulation of fat not only causes physical health problems for individuals living with obesity, but also metabolic health problems, given that fat cells (adipose tissue) are part of the body's endocrine system. Further, obesity has important psycho-social effects and consequences increasing the burden of poor wellbeing.

The prevalence of obesity is growing. The associated risks and complications are among the most challenging contemporary threats to global public health (18 p. 13). The World Health Organisation (WHO) estimates that more than half the world's adult population is living with either overweight (39%) or obesity (13%) (19 p. 14). In 1990, 4.2% of the world's children were living with overweight or obesity; by 2010, this had risen to 6.7% and is expected to reach 9.1%, or 60 million children, by 2020 (20 p. 15). Overall, since 1980, the global prevalence of obesity has more than doubled and the incidence of childhood obesity has increased significantly. The majority of these children will go on to have obesity into adulthood.

Australia's obesity rate now ranks fifth among Organisation for Economic Co-Operation and Development (OECD) countries (21 p. 16). In 2017-18, more than two thirds (67%) of Australians aged over 18 years were living with overweight or obesity; more than a third (35.6%) were living with overweight and 31% with obesity. This overall prevalence increased from 63% in 2014-15 and 56% in 1995. This rise in prevalence is attributable to obesity (BMI>30), which increased from 19% to 28% and severe obesity (BMI>35), which almost doubled from 5% to 9% between 1995 and 2014-15 (22 p. 17). Australians more likely to live with overweight or obesity include:

- Indigenous children and adults
- those living outside of major cities
- those who are in lower socioeconomic groups.

Although the prevalence of obesity is increasing, access to the full suite of treatments is limited in Australia, including access to bariatric surgery. Despite being one of the most effective methods for treatment of obesity, there remain barriers to access especially in the public hospital setting. With appropriate considerations, making bariatric surgery available within the public hospital setting can provide life-changing benefits to those who need it most.

Purpose of this document

Over 90% of all bariatric surgery is currently performed in the private system despite a large community prevalence of obesity across the Australian population. The lack of public bariatric surgical services means there is limited ability for clinical governance around training, techniques, procedure choice and care pathways. There are limited means of credentialing, peer audit and implementation of quality and safety processes to maintain and/or improve patient outcomes. This highlights the need for a greater presence of bariatric surgical services in our public hospital system alongside strong clinical governance and standardised training pathways with clinical supervision, peer review/audit, and introduction of robust systems for credentialing in order to maintain and improve standards, quality and safety of bariatric surgery, and ensure it is targeted at those patients in most need.

The 2017 Public Bariatric Surgery ANZMOSS Summit identified that a National Framework was required to provide clear guidelines to health policy makers, clinical governance boards and health practitioners. The purpose of this National Framework is to enable and inform:

- facilitation of successful implementation of bariatric surgery more widely in Australia's public hospital system
- standardisation of key care elements such as patient eligibility and prioritisation
- a reduction in variations in preoperative and postoperative care pathways
- development of a sustainable model of care to manage potential demand.

This National Framework is the result of expert consensus from the ANZMOSS and Collective Public Bariatric Surgery Taskforce (the Taskforce), involving and endorsed by key stakeholder organisations in the treatment of obesity and bariatric surgery (see Taskforce members and participating organisations in Appendix A).

Bariatric surgery

Bariatric surgery is a safe and effective form of therapy for obesity and its related complications and risks (23 p. 18; 24 p. 19) (23 p. 2). Non-surgical intervention, such as lifestyle modifications alone should be the first line approach for managing any form of obesity. Other non-surgical interventions such as Very Low Energy Diets (VLED) or pharmacotherapy can be effective and should be considered prior to bariatric surgery for managing people living with obesity. However, for patients with established clinically severe obesity, in many, but not all instances these modalities are effective only to a certain degree and there is evidence that meaningful weight loss using these methods alone in the long term is not always maintained (25 p. 20). Whilst social and environmental factors contribute to weight regain, evidence suggests that biological factors also play part, as appetite is upregulated in response to weight loss (see section on causes of obesity). All medical intensive therapies including pharmacotherapy and bariatric surgery work physiologically within the brain to counteract the body's physiological defence mechanisms to enable sustained weight loss.

Bariatric surgery has been demonstrated to achieve meaningful sustained weight loss over the medium to long term (26 p. 21; 27 p. 22). This is principally due to the fact that bariatric surgery addresses the underlying patho-physiology driving obesity (28 p. 23). Bariatric surgery results in anatomical and physiological changes that diminish appetite and produce prolonged satiety which facilitates weight loss whilst keeping hunger suppressed. Randomised controlled trials (29 p. 24) and major longitudinal studies, such as the Swedish Obese Subjects Study (SOS) (30 p. 25), have repeatedly demonstrated sustained effective weight loss due to bariatric surgery with substantial improvements in diabetes, cardiovascular health and reduced mortality (31 p. 26) which is maintained for more than ten years after surgery.

Improvement and remission of obesity-related complications and risks

The association between bariatric surgery and improvement in obesity-related risk and complications has been well documented. This is true in particular for type-2 diabetes, with many studies demonstrating excellent rates of remission or amelioration. A recent study comparing gastric bypass surgery, sleeve gastrectomy surgery and intensive medical therapy for severe diabetes in individuals living with obesity has shown superior outcomes at five years for surgical intervention compared to medical therapy (32 p. 27). Studies also demonstrate improvements in, or reversal of, obstructive sleep apnoea (33 p. 28), polycystic ovarian syndrome (34 p. 29), hypertension/dyslipidaemia/cardiovascular risk (35 p. 30), asthma (36 p. 31), non-alcoholic steatohepatitis (37 p. 32), osteoarthritis and other forms of inflammatory arthropathy and joint replacement (38 p. 33; 39 p. 34) as well as life expectancy (40 p. 35; 30 p. 25).

Improvement in comorbid disease can be related to the degree of weight loss, though there is evidence that direct metabolic changes induced by surgery also have non weight-dependent effects on comorbidity. The best studied of these is the rise in glucagon-like peptide-1 (GLP-1) following gastric bypass procedures which has a direct effect on insulin-producing beta cells. In turn, this increases the chance of reversing more advanced forms of type 2 diabetes through direct anti-diabetic mechanisms (41 p. 36). Of interest are observations that surgery such as sleeve gastrectomy and gastric bypass can induce changes in food choice toward healthier options in some patients, which appears to be biologically mediated, although the precise mechanisms remain unknown (42 p. 37).

Effect on quality of life and psychosocial wellbeing

In a review of bariatric surgery outcomes, the National Health and Medical Research Council (NHMRC) reports that quality of life is improved in the majority of patients following bariatric procedures and that improvement in psychosocial functioning is well maintained at two years post-surgery. Self-image, state of happiness, social interaction and employment opportunities are increased three years after surgery compared with before the operation (43 p. 38). Other recent studies report positive effects of surgery on quality of life and psychological health (44 p. 39; 45 p. 40). While most of these studies are from overseas, Australian research also reports improved quality of life after bariatric surgery (46 p. 41). This highlights the adverse effect obesity has on quality of life: even when bariatric surgery causes significant discomfort or lifestyle restrictions (including limitations on food intake and the need for major changes in eating habits), the improvement in quality of life exceeds the ill effects of the eating-requirements of the operation.

In contrast to these positive assessments, some studies suggest that some patients experience a negative psychological response post-operatively, and that improvements in psychosocial status wane with time. Sarwer and colleagues (47 p. 42) comprehensively reviewed the research on quality of life and psychosocial wellbeing following bariatric surgery, including studies indicating possible negative impacts for some patients. A recent article by this research group concludes that while the vast majority of patients have improved psychological functioning, a minority struggle with post-operative psychological issues such as depression, disordered eating, body image dissatisfaction and suboptimal weight loss (48 p. 43). Some individuals experience relapse of their mental illness upon weight regain (49 p. 44). ***This highlights the importance of the provision of psychological support being delivered in a multidisciplinary care team within the bariatric surgery service and/or in the community via a GP referral, where possible.***

Differences between bariatric procedures

Bariatric procedures can be categorised according to mechanism of action; mechanical, metabolic and malabsorptive. The mechanical bariatric procedures induce satiety and diminish hunger through neurologically mediated pressure effects in the upper stomach. The metabolic procedures add to this by recruiting gut appetite hormone changes and direct metabolic effects. The malabsorptive procedures add true calorie and macronutrient and/or micronutrient malabsorption to further reduce caloric surplus and enhance weight loss. The types of bariatric procedures are listed below:

4. mechanical:
    - adjustable gastric banding (LAGB) (16 p. 45)
5. combined mechanical and metabolic:
    - sleeve gastrectomy (SG)
    - *Roux-en-Y* gastric bypass (RYGB)
    - mini gastric bypass - one anastomosis bypass (MGB - OAGB)
6. combined mechanical, metabolic and malabsorptive:
    - biliopancreatic diversion (BPD)
    - duodenal switch (DS).

A brief description of the common bariatric procedures is provided in Appendix D.

Most studies, including randomised comparisons, demonstrate that the degree of weight loss, metabolic effect and impact on comorbidities for the metabolic procedures (SG and RYGB) is greater than for mechanical procedures such as LAGB (29 p. 24; 16 p. 25). Malabsorptive procedures (BPD and DS) have the greatest weight loss and metabolic effect but at a cost of significantly higher malnutrition risk (50 p. 46).

Choice of procedure for an individual patient is a complex decision governed by the clinical needs of the patient, as well as their medical history and social context (geographical, work, lifestyle).

Cost-effectiveness

There is consistent evidence to demonstrate the cost-effectiveness of bariatric surgery by standard measures and in comparison to non-surgical treatments (51 p. 47). Example publications that demonstrate cost-effectiveness of bariatric surgery include the recent UK's National Health Service (NHS) reports, which conclude bariatric surgery provides cost benefit in the short and long term compared to non-surgical treatment and that further cost savings could be achieved with greater utilisation of bariatric surgery (52 p. 48; 51 p. 47).

Research examining cost-effectiveness in the Australian context (3 p. 6) included the cost of associated complications and revisional surgery. This study concluded that the probability of any single patient operation proving cost effective was between 64% and 75%, with RYGB being more cost effective than SG and both more cost effective than LAGB. Cost effectiveness was even greater in diabetic patients.

Further, a report by PwC (53 p. 49) estimated the potential impact over a decade if 4,200 additional people living with obesity were to receive bariatric surgery each year. The cost break-even point was at 13 years after surgery (per cohort) with continued benefit beyond the ten-year period at $5.2 million per year from the tenth year. There are some overall research limitations to this report, including study design and selection of data points.

Of a number of other studies that have evaluated cost-effectiveness over the longer term, some have taken into account the full range of potential costs (e.g. surgery-related adverse events and the need for abdominoplasty or other additional surgery) and savings (e.g. obesity-related non-medical costs).

Complications of bariatric surgery

Surgical interventions for clinically severe obesity carry some risk, but these are significantly less than the health risks associated with clinically severe obesity and compare favourably with many other general surgical abdominal operations. The binational (Australia and New Zealand) Bariatric Surgery Registry (BSR), which captures data from approximately 65% of all bariatric procedures in Australia, confirms that the adverse event rate is low; around 2.4% for primary bariatric procedures and around 6.6% for revisional bariatric procedures (54 p. 50). The adverse event rate is higher for bypass procedures (between 7-10%) than for LAGB or SG procedures (between 2-4%). Mortality is low as reported by systematic reviews; 0.05% for LAGB, 0.5% for RYGB. BSR data is maturing but at 2017-18, mortality of all causes was 0.09% with less than half of these likely procedure related. Moreover, the EOSS criteria used by the proposed eligibility criteria further predicts the risk of perioperative complications, with an increased EOSS score corresponding with an increased risk of a perioperative complication (55 p. 51; 56 p. 52) (57 p. 53).

While there is no comparable Australian research, studies in the United States demonstrate that the likelihood of post-operative complications is significantly associated with the level of experience of both surgeons and the hospitals that host the operations. The risks are greatest when surgeons perform fewer than 25 operations and hospitals host fewer than 50 operations per year (58 p. 54). In discussing the relationship between surgical volume and mortality/morbidity, a practice guideline from the American College of Physicians (59 p. 55) reports findings from several different bariatric surgery studies, all of which indicate a strong inverse relationship between surgeon experience and the rate of complications. Reduction of variation in practice, standardisation of approach, and expert teams are all factors that may reduce adverse event rates.

Community perceptions of public funding for bariatric surgery

Studies examining Australian community perceptions of public funding allocation for bariatric surgery demonstrate:

- greater preference for prioritising patients with demonstrable obesity-related comorbidity and greater BMI (60 p. 56)
- limited preference related to age up to 50 years (60 p. 56)
- strong preferences to prioritise those demonstrating commitment to lifestyle changes and those perceived as having the best chance of a positive outcome (61 p. 57).

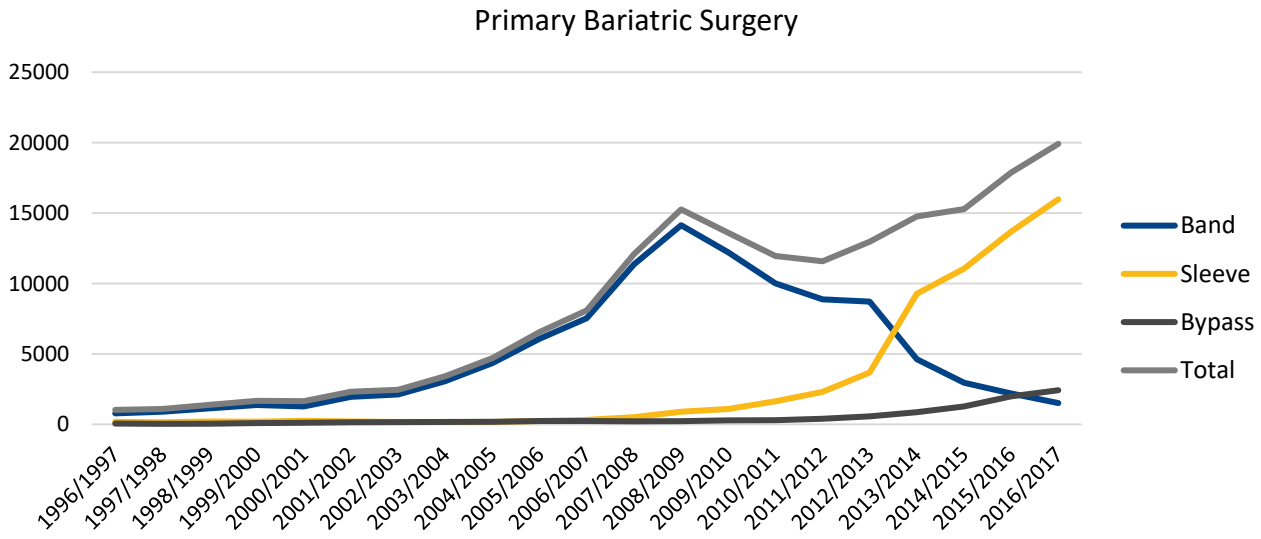
Attitudes toward socioeconomic status and private insurance status were not formally evaluated and it is important to note that the survey did not specifically include individuals with the lived experience of clinically severe obesity (61 p. 57).

Whilst “attitude” should not formally influence prioritisation categories, these findings are nonetheless important to consider in a public hospital bariatric surgery service model. These “attitudes” highlight the importance of preoperative preparation pathways to surgery within a treatment framework and the need to mitigate the unconscious bias that healthcare teams may have towards patients perceived to have health behaviours or attitudes deemed unsuitable for bariatric surgery. The importance of preoperative preparation pathways is addressed in section 3 of this National Framework.

Bariatric surgery in Australia

Australia has a long history in bariatric surgery but procedures were only performed in significant volume after the development of LAGB during the 2000s. Procedure patterns have shifted considerably in the last ten years as seen in Figure 2. LAGB dominated for over a decade, reaching a peak in 2008, but has been in relatively rapid decline since then. Sleeve gastrectomy has become the most common procedure, now representing 70% of all surgeries. Gastric bypass has increased steadily over the years but remains relatively low volume in Australia.

Figure 2: Primary Bariatric Surgery Procedures in Australia 1996-2017 (62 p. 58)



The need for more delivery of bariatric surgery in public hospitals[10] (6)

In Australia, the majority of bariatric surgery (more than 90%) is currently performed in the private health sector. Access to bariatric surgery in the public hospital system remains critically poor. Only 950 from over 24,000 hospital separations in 2016 were from public hospitals meaning that only 4% of all bariatric surgery were publicly funded (62 p. 58). Just 15 of 700 public hospitals have a form of bariatric surgical service available and these are not distributed proportionally from a geographic perspective; four of these hospitals are in Victoria, one is in Western Australia and none are in the Northern Territory, for example. (63)

Existing public bariatric surgery service models, eligibility and prioritisation criteria, procedures available, patient care pathways and data collection are not standardised and wide variation exists between access to services and patient outcomes (64 p. 59).

This raises several concerns. Foremost is the inequity of access for patients unable to afford private health care. This is particularly iniquitous given that obesity is more prevalent and more severe in lower socioeconomic communities and rural areas. Given that surgery is the most effective form of therapy for clinically severe obesity, the lack of access creates a critical situation.

Increasingly, bariatric surgery is becoming a key treatment strategy in modern management paradigms of many diseases. This is well demonstrated in type 2 diabetes where international consensus statements by diabetes organisations (including the American Diabetes Association and the International Diabetes Federation) have reordered an algorithm of diabetes treatment to incorporate bariatric surgery earlier and more frequently in the treatment of patients with diabetes who also have obesity, including for Class I obesity, i.e. BMI≥30 (12 p. 10). Australian public hospitals, in the main, cannot provide national and international "standard of care" treatment for diabetes (and increasingly other chronic diseases) in the form of bariatric surgery, despite recognition of bariatric surgery as an early treatment option in Australian-developed guidelines.[11] This means our hospitals are providing substandard care for these diseases.

Importantly too, surgical training, credentialing, and development of standards and processes for quality and safety tend to rely on programs within the public hospital system where experienced clinicians can provide appropriate supervision of trainees. The discipline of bariatric surgery currently has limited clinical governance, structured training opportunities or programs and standardisation. A greater number of training places in the public system are critically required in this rapidly growing discipline to ensure better health outcomes for patients

[10] Access to obesity services of any kind are poor in the public health system as illustrated by the NACOS report "Clinical Obesity Services in Public Hospitals in Australia: a position statement based on expert consensus".

[11] Incl. guidelines developed by ANZMOSS, ANZOS and ADS

A greater presence of bariatric surgery in public hospitals will also normalise the notion of obesity as a disease, breakdown prejudice and facilitate patients seeking appropriate help as treatment for obesity becomes a "normalised" process. This has been seen in countries such as America and Canada and some European countries.

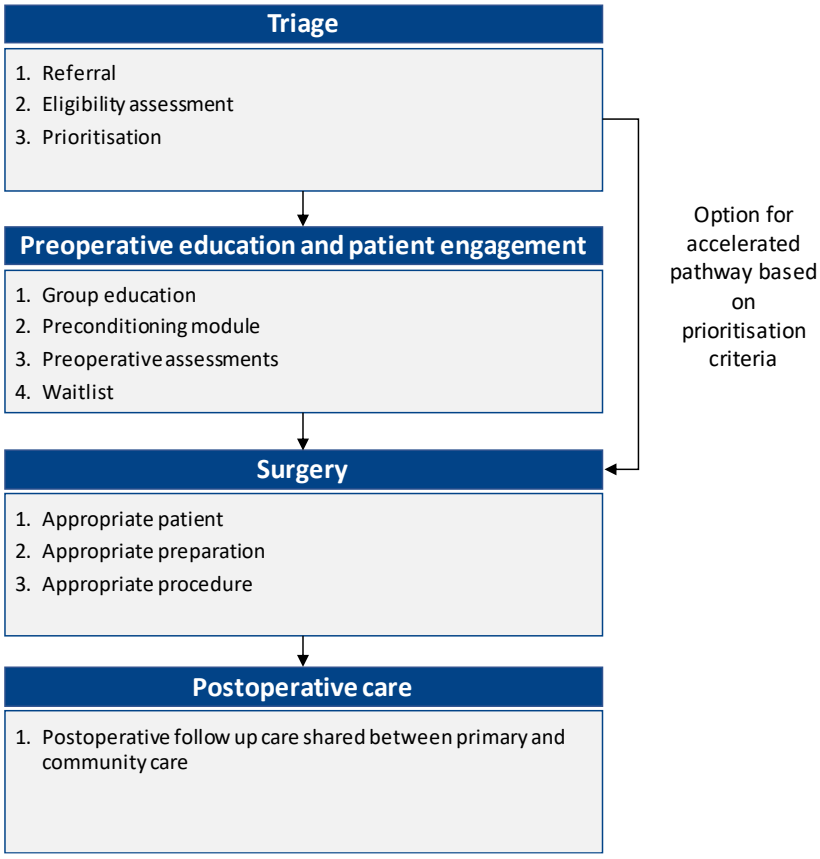
The proposed way forward

It is important that patients who receive bariatric surgery in a public hospital setting have access to comprehensive treatment options including dietary and lifestyle interventions, medical and pharmacotherapy treatment and surgical treatment.

The Taskforce is proposing this carefully considered bariatric surgery service model for the public hospital system to address this unmet need. It includes several stages from triage to postoperative care and working through each stage allows selection of eligible patients that are most prepared and suited to undergo bariatric surgery.

Figure 3 outlines the proposed patient flow for bariatric surgery in the public hospital system.

Figure 3: Proposed patient flow through the public hospital system



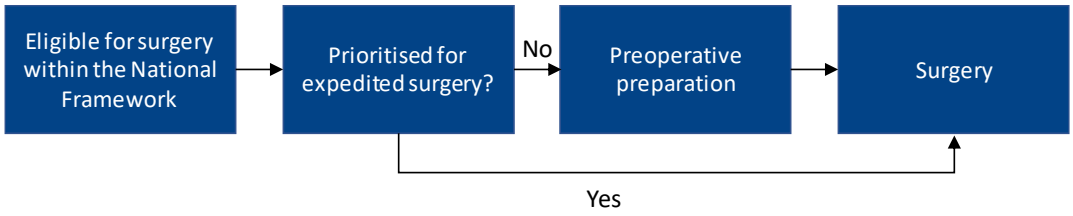
The next sections of this document detail each element to the proposed National Framework.

2. Triage, including eligibility and prioritisation criteria for access

This section covers both eligibility and prioritisation as two distinct principles to guide which patients should receive bariatric surgery and when. For the purposes of this National Framework, eligibility refers to determination of whether a patient should or should not have bariatric surgery, and prioritisation refers to the relative urgency of the bariatric surgery that should take place.

An overview of the eligibility and prioritisation pathway for bariatric patients is illustrated in Figure 4 below.

Figure 4: Eligibility and prioritisation pathway



Eligibility criteria

For many decades, the internationally accepted eligibility criteria for bariatric surgery have been based on the National Institutes of Health (NIH) Consensus Statement published in 1992 (65 p. 60). The criteria are:

- BMI of 40 or higher
- BMI of 35 or higher in a patient with a high-risk condition such as severe sleep apnoea, obesity-related cardiomyopathy, or severe diabetes mellitus
- additional criteria included failure of medical weight control
- absence of medical or psychological contraindications
- the patient's understanding of the procedure and its risks.

These criteria make clear the need for a multidisciplinary approach that includes medical, surgical, nutritional and psychological elements.

In more recent times and with the increasing use of laparoscopic surgery as well as improved safety (66 p. 2), lower BMI thresholds (BMI 30 – 35) have been considered in suitable patients. This is because evidence suggests that patients with Class I obesity can benefit from surgery at acceptable operative risk (67 p. 61; 68 p. 62). Recent international diabetes organisation consensus statements recommend bariatric surgery be considered in patients with Class I obesity (BMI 30-35) and poorly controlled type 2 diabetes (12 p. 10).

There is also recognition that certain ethnic considerations need to be assessed in context. For example, patients from Aboriginal and Torres Strait Islander and Asian (in particular, East Asian) backgrounds incur metabolic complications of obesity at lower cut-off than Caucasian patients. In these populations, BMI action cut-point lowering of 2.5 has been recommended by WHO (69 p. 63), with the cut-off point for obesity starting at a BMI of 27.5 rather than 30 (70 p. 64). This has led to a global recognition that eligibility for weight loss interventions, including surgery, in high risk ethnicity groups should be lowered by 2.5 BMI points to 32.5 with comorbidities, and as low as 27.5 for those with poorly controlled type 2 diabetes (71 p. 65).

We address eligibility and prioritisation for bariatric surgery within the colored zones below.

Figure 5: Classification of weight category by BMI (adapted from WHO 2004)[12]

Classification	BMI(kg/m2)	
	Principal cut off points	Cut off point Asians
Normal range	18.5-24.9	18.5-22.9
		23.0-24.9
Overweight	25.0-29.9	25.0-27.4
		27.5-29.9
Class I Obesity	30.0-34.9	30.0-32.4
		32.5-34.9
Class II Obesity	35.0-39.9	35.0-37.4
		37.5-39.9
Class III Obesity	≥40.0	≥40.0

In 2015, up to 1.4 million Australians were living with Class II or III obesity (BMI >35) (72 p. 66). Using population health statistics, Sharman et al (73 p. 67) estimated the number of patients potentially eligible for bariatric surgery based on the traditional NIH criteria (BMI >35 with comorbidity or BMI >40) at 870,000 Australians. Even at a surgical penetrance of 2-5%, the prevalence of disease has the potential to overwhelm the capacity to deliver surgical care to those potentially eligible in the public hospital system.

Cognisant of potentially high demand, it is vital that a National Framework for Public Bariatric Surgery provides for a realistic and sustainable platform to deliver care in a timely, equitable and high-quality manner. Access to public bariatric surgery needs to be rationalised to when surgery represents best care and eligibility criteria to enter a public bariatric surgical program. The National Framework must address this potential demand to enhance care value and minimise the risk that services will be overwhelmed. This will facilitate sustainable delivery of care to the greatest benefit. It is stressed that patients who are determined ineligible for public bariatric surgical access according to the criteria should be offered alternative treatment options by either the service or the referring general practitioner or other specialists.

Determining how best to apply limited resources for greatest benefit in health care is complex, in part because it requires balancing relative societal values for which there is no validated empirical method of determination. Patients without established weight-related complications or risk factors may derive benefit from complication prevention. On the other hand, patients with established weight-related chronic diseases or major risk factors benefit from amelioration or remission of these complications and risks. All potentially benefit from improved quality of life and wellbeing.

Whilst the greatest long-term benefit in terms of quality adjusted life years gained may be in early intervention in younger patients with established risk, there is a societal bias toward treating those in most apparent need (74 p. 68; 75 p. 69) (61 p. 57). Health economic analysis consistently indicates that bariatric metabolic surgery is cost effective in developed countries including Australia and may be dominant in those with type 2 diabetes (3 p. 6; 76 p. 70) (77 p. 71).

[12] For Asian populations, classifications remains the same as the international classification but that public health action points for interventions are set at 23, 27.5, 32.5 and 37.5.

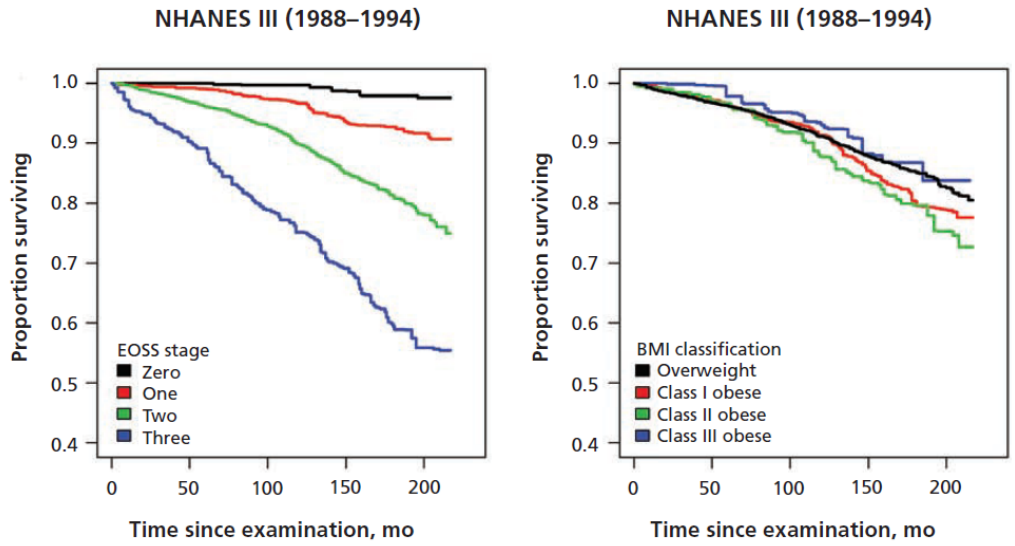
Prevention of premature mortality is a “hard end point” that can potentially be used to determine benefit of bariatric surgery and act as a proxy for health benefit overall. Whilst risk of premature mortality is related to increasing BMI, BMI alone does not stratify or discriminate completely.

Of interest is recent population level data from Canada that stratifies the premature mortality risk in patients living with obesity based on risk factors additional to BMI, including metabolic, physical and psychological. This risk stratifying tool is called the Edmonton Obesity Scoring System (EOSS) (10 p. 7). The EOSS sub-classifies populations living with obesity into five score groups that predict mortality more reliably than BMI alone. The EOSS stages can be summarised as:

- EOSS 0: no associated disease or impairment
- EOSS 1: preclinical disease
- EOSS 2: established disease
- EOSS 3: end organ disease
- EOSS 4: end stage disease.

As seen in Figure 6, patients in group zero, regardless of measured BMI, have very little predicted risk of mortality compared to patients in group 3 who have a very high risk of mortality (10 p. 7).

Figure 6: Survival by EOSS vs BMI



The criteria defining each score group is listed in Table 3 below.

Table 3: EOSS Criteria

The Edmonton Obesity Staging System (EOSS)	
EOSS	**Stage Description**
0	No apparent risk factors (e.g. blood pressure, serum lipid and fasting glucose levels within normal range), physical symptoms, psychopathology, functional limitations and/or impairment of well-being related to obesity.
1	Presence of obesity-related subclinical risk factors (e.g. borderline hypertension, impaired fasting glucose levels, elevated levels of liver enzymes), mild physical symptoms (e.g. dyspnoea on moderate exertion, occasional aches and pains, fatigue), mild psychopathology, mild functional limitations and/or mild impairment of well-being.
2	Presence of established obesity-related chronic disease (e.g. hypertension, type 2 diabetes, sleep apnoea, osteoarthritis), moderate limitations in activities of daily living and/or well-being.
3	Established end-organ damage such as myocardial infarction, heart failure, stroke, significant psychopathology, significant functional limitations and/or impairment of well-being.
4	Severe (potentially end-stage) disabilities from obesity-related chronic diseases, severe disabling psychopathology, severe functional limitations and/or severe impairment of well-being

It has been suggested that the EOSS could be used to select patients for bariatric surgery. For such utility, there needs to be an agreement that meaningful reduction in mortality risk and response of obesity-related complications outweighs more general quality of life effects (note that "severe functional disability" is included in the definition of comorbid disease).

Taking this approach, it could be argued that patients assessed as EOSS 0 will have limited gains from bariatric surgery compared to those with EOSS 2 and 3. Patients assessed as having an EOSS 4 with end stage disease, are unlikely to derive a significant survival benefit or have substantial improvement in co-morbid disease compared to those assessed as having EOSS 2 and 3. However, to categorise an individual at EOSS 4 and not a priority for surgical intervention requires the skills and experience of a bariatric assessment team.

ANZMOSS & Collective Public Bariatric Surgery Taskforce recommendations for eligibility criteria

The following section provides recommendations from the Taskforce under four eligibility criteria, including degree of obesity and disease, age, previous weight loss attempts and other contraindications. The recommended eligibility criteria and contraindications are outlined in Table 4.

Table 4: National Framework Eligibility Criteria Summary

Qualifying criteria	Contraindications
If the patient in review is: • Aged 18-65, BMI >35-40, EOSS 2-3 **AND** • Documented previous weight loss attempts/treatments • Absence of contraindications (see next column) **OR** • Aged 18-65 years, BMI>40, EOSS 1-3 **AND** • Documented previous weight loss attempts/treatments[13] • Absence of contraindications (see next column) **OR** • Aged 65-70, EOSS 2-3 and BMI >40	If the patient in review has any one or more of the following contraindications, they will not be eligible for bariatric surgery: • Medical contraindications to surgery after risk assessment • Alcohol/illicit drug dependence • Untreated severe depression • Untreated DSM-5 eating disorders not managed by an appropriate healthcare professional(s) • Active psychosis.

[13] By GP, dietitian, EP or other HCP

AND • Documented previous weight loss attempts/treatments • Absence of contraindications (see next column)	
Diabetes	
• BMI>30 – 35 **AND** had T2DM for <10 years or has favourable C – Peptide level [14] which is poorly controlled with medication • BMI > 35 with established diabetes	

Degree of obesity and disease to consider assessment

RECOMMENDATION 1:

The National Framework recommends that the first element of eligibility criteria for accessing bariatric surgery in the Public Hospital System is determined according to:

- BMI 35-40 with EOSS 2-3
- BMI >40 with EOSS 1-3
- exclusion of patients with EOSS 0 regardless of BMI[15]
- exclusion of patients with EOSS 4[16] regardless of BMI with exception of candidates for renal or liver transplant

It is challenging to estimate the potential pool of eligible patients in Australia using this parameter with currently available data, but it is likely to be approximately 10-15% less than the estimates of Sharman et al (of 882,441) (73 p. 67), and could be approximately 730,000.

Patients who have an EOSS 3 will be considered if there is good potential for improvement from bariatric surgery. Those with a BMI >40 and an EOSS 4 between the ages of 18 and 65, require a skilled bariatric team assessment to ensure they do not have an EOSS 3 and require urgent active intervention (see section on early urgent assessment and management plan).

Age

RECOMMENDATION 2:

The National Framework recommends that the following patients by age cohort are considered eligible for bariatric surgery in the public hospital system:

- aged 18 – 65 be considered eligible
- aged 65 – 70 with good life expectancy but significant co-morbid disease and functional impairment (EOSS 2 or 3) and BMI >40.

Currently, this National Framework does not include considerations for children and adolescents who may need bariatric services. Additional considerations and guidelines will be developed for paediatric and adolescent bariatric surgery at a later stage. At this stage the Taskforce recommends that specialised units with an interest in this area and appropriate multidisciplinary paediatric expertise be supported in providing such services in each jurisdiction. Australian and New Zealand guidelines for bariatric-metabolic surgery for adolescents were developed in 2010 and more recent English NHS guidelines were developed 2018 (78 p. 72; 79 p. 73; 80; 81).

In the older population there is concern regarding adverse effects of bariatric surgery, particularly those associated with bone health and muscle mass that may reduce quality of life and increase frailty. This is of particular importance after resectional types of bariatric operations and lesser so after laparoscopic gastric banding (82 p. 74). Adverse

[14] Cost effectiveness typically increases if surgery is performed within five years of diagnosis of T2DM.

[15] It is recognised that as a BMI >40 is approached, it is likely that a patient will have some form of functional impairment and is likely to fall into EOSS score I or greater.

[16] EOSS 4 patients will require assessment by an MDT team to determine whether the end stage disease is palliative prior to exclusion from surgery.

effects may be partly mitigated by identifying those patients who are at higher risk of developing osteoporosis, paying careful attention to calcium and vitamin D supplementation, regularly monitoring of bone health (83 p. 75), assuring adequate quality protein intake, and appropriate weight bearing and resistance exercise.

The BMI of lowest mortality rises with age, where patients over the age of 70 with "overweight" or "Class I obesity" i.e. BMI 30-34.9 have reduced mortality compared to healthy weight (defined as BMI between 18.5 and 25) counterparts (84 p. 76; 85 p. 77) (86 p. 78) (86 p. 79).

Evidence based guidelines for the benefits of intentional weight loss for those over 70 years are not available (84 p. 76; 87 p. 80). Health priorities of the elderly differ significantly to those of middle age (88 p. 81). The direct risks of surgical morbidity and mortality are increased and outcomes relevant to elderly (including quality of daily living, frailty, bone health, nutritional and cognitive function) have not been assessed (89 p. 82; 90 p. 83). There are numerous studies looking at the elderly, defined over 55, 60 or 65 years of age; these reports focus on the extent of weight loss being comparable to younger patients, safety, and changes in traditional complications and risk factors (91 p. 84).

Previous Weight Loss Attempts/Treatments

RECOMMENDATION 3:

The National Framework recommends that the eligibility criteria for patients seeking bariatric surgery in the public health system require documented previous attempts at non-surgical therapies without sustained weight loss.

Obesity therapy should be tailored to the patient's individual health profile including obesity stage, health care needs, informed consent and willingness to actively engage in the management of their chronic health condition.

In general, prior attempts at weight loss with lifestyle and dietary adjustment must be documented before proceeding to surgical intervention, for example by their General Practitioner or dietician. Whilst only a small percentage of patients will respond to such therapies alone, they are important as the benefits after weight loss from a healthy diet and physical activity will be established for both before and after additional medical and surgical interventions (92 p. 85; 93 p. 86), (94 p. 87)

It is rare for a patient to seek bariatric surgery having not already attempted weight loss through a number of non-surgical therapies (95 p. 88). Normalising the evidence regarding poor weight loss maintenance results from lifestyle interventions helps reduce internalised weight stigma that has become psychologically and physically damaging (96 p. 89). For example, education about the body's physiological response to weight loss by diet and exercise interventions, making weight loss maintenance very difficult for most will start to address some of the weight shame and stigma people with obesity often feel, and also provide reassurance and confidence to the individual patient in the decision to undergo bariatric surgery. Increasing community acceptance of delivering bariatric surgical care in the public health system in appropriate circumstances will support a reduction in weight stigma (61 p. 57).

Other Contraindications

RECOMMENDATION 4:

The National Framework recommends that contraindications to bariatric surgery include the traditional contraindications listed below. As with other surgical procedures active smoking should cease prior to bariatric surgery.

Traditional contraindications to bariatric surgery include:

- medical contraindications to surgery after risk assessment[17]
- alcohol/illicit drug dependence
- active psychosis

[17] These may be relative rather than absolute and require careful assessment by the treating unit. Examples include: severe inflammatory gastrointestinal disease, active cancer, unstable heart or lung disease, advanced liver disease with portal hypertension, uncontrolled obstructive sleep apnoea with pulmonary hypertension, and serious blood or autoimmune disorders. Female patients of child-bearing age should not be pregnant at the time of surgery and should be counselled to use reliable forms of contraception and avoid getting pregnant for at least 12-18 months post bariatric surgery.

- untreated severe depression
- untreated DSM-5 eating disorders not managed by an appropriate healthcare professional(s).

Patients should be supported to cease smoking prior to bariatric surgery and undertake life-long abstinence post-operatively.

Additional considerations

Several additional considerations may serve caution as relative contraindications, as outcomes may be compromised. These considerations include significant intellectual impairment, unrealistic expectations, and poor engagement in therapeutic aspects of the procedure (either in terms of weight loss or in terms of the impact on life in general).

There are also specific medical conditions that are contraindications for some or all surgical procedures that should be assessed by the bariatric assessment team.

Prioritisation

Managing the treatment of eligible patients will require prioritisation according to clinical need. Prioritisation is sequential to eligibility; it refers to the relative urgency of the bariatric surgery that should take place.

Typically, prioritisation is dominated by historic patterns of resource allocation and political pressure rather than high performance priority setting and resource allocation analysis (97 p. 90). Similarly, prioritising health care associated with a systematically stigmatised and poorly understood condition such as obesity using public opinion is inappropriate and may lead to disparities in health care. Health intervention prioritisation is based on principles including efficacy, degree of benefit, health economics, and fairness.

Priority for assessment and surgery should be given to patients with significant chronic diseases that are currently not well treated but which are known to respond well to weight loss (11 p. 8; 98 p. 9). These conditions include:

- diabetes mellitus type 2 (12 p. 10)
- idiopathic intracranial hypertension (13)
- polycystic ovary syndrome and/or obesity related primary infertility (14 p. 11)
- non-alcoholic steatohepatitis
- obstructive sleep apnoea and/or obesity hypoventilation syndrome
- obesity-related cardiomyopathy (15).

It is recommended that after eligibility is confirmed (as per the previous section) that patient prioritisation occurs in the following order:

Table 5: Patient priority groups

First priority group	Second priority group
1. ***First priority group for urgent assessment and timely surgery if appropriate:*** Patients aged 18-65 years and BMI >40 who have an urgent need for weight loss interventions and are classified as requiring a timely assessment. Conditions in this category may include individuals with BMI > 50 (99 p. 91) or BMI >40 with: – poorly controlled Type 2 diabetes – obesity hypoventilation syndrome with significant symptoms and disability (100 p. 92; 101 p. 93)* – weight related Idiopathic Intracranial Hypertension (IIH) (typically seen in premenopausal women) (102 p. 94; 103 p. 95) (104 p. 106)* – polycystic ovary syndrome and/or obesity related infertility* – heart failure, limited to those with preserved ejection fraction and diastolic dysfunction (105 p. 96; 106 p. 97)* – non-alcoholic steatohepatitis with evidence of Stage 1-3 fibrosis (107 p. 98; 108 p. 99)* (those with compensated cirrhosis should also be considered (109 p. 100)) – end-stage renal disease necessary preconditioning for renal transplant (110 p. 101; 111 p. 102) (112 p. 103)* – end-stage liver disease necessary preconditioning for liver transplant – major physical dysfunction in patient requiring arthroplasties (113 p. 104)* – patients with established stable cardiovascular disease (including hypertension, heart failure, and coronary artery disease) (114 p. 105).*	2. ***Second priority group prioritised for surgery:*** This cohort would be prioritised for bariatric metabolic surgery with BMI 40 – 50 (BMI 30-40 with type 2 diabetes); or following an inadequate response to nonsurgical weight loss therapy in the BMI range 35 to 40 with: – type 2 diabetes (12 p. 10) – NASH – without evidence of significant fibrosis* – obesity hypoventilation syndrome* – polycystic ovary syndrome and/or obesity related infertility – metabolic cardiac dysfunction – cardiomyopathy* – high risk of IHD with multiple risk factors not responding to established medical therapy – major weight responsive psychological or mental impairment (EOSS 3) – major weight responsive physical disability (EOSS 3).

*Groups at very high risk with strong theoretical and observational evidence of benefit, but convincing evidence is limited. These conditions should be monitored within specific registry projects.

3. Preoperative pathways

This section discusses each stage of the preoperative education and assessment processes recommended for patients in the public system, according to the eligibility and prioritisation criteria outlined above.

The aim of preoperative education and patient education is to embed realistic expectations about the surgery for the patient, who is well informed about the risks and benefits and is prepared and able to commit to dietary and lifestyle changes as well as ongoing clinical follow-up. A lack of patient commitment post-surgery have been associated with poorer outcomes (115 p. 107) and commitment has also been demonstrated to be an important community value in selecting patients for public bariatric surgery (60 p. 56; 61 p. 57).

The information in this section is relevant for new surgical patients only. It excludes patients seeking revisional bariatric surgery and/or patients seeking management of complications from previous bariatric surgery(s), assuming these patients have gone through preoperative measures prior to their initial surgical treatment. It is noted that some patients seeking revisional bariatric surgery may benefit from preoperative education, if an extensive time period has lapsed, or otherwise determined on an individual basis.

Preoperative education

RECOMMENDATION 5:

The National Framework recommends that all eligible patients to go through preoperative education including group education, a preconditioning education and engagement program and personalised education prior to preoperative assessment.

Preoperative education is a continuum from the assessment process to the point of surgery. It should provide information and support to patients and, if appropriate, members of their families to facilitate the patient's understanding of the procedure and ensure they have realistic expectations about surgery outcomes. Information should include details about the potential benefits of surgery, dietary and lifestyle implications, and the associated risks, including complications.

The recommended preoperative education stages described in more detail below are:

- initial information and education
- preconditioning program
- personalised education.

Initial information and education

All bariatric surgery services in the public hospital setting should offer initial information and education to eligible patients. The purpose of initial group education, which can be delivered in a group session setting, is to introduce patients to information on the physiology of obesity and clarify the role, nature, mechanism and implications (positive and negative) of bariatric surgery (116 p. 108). The initial information education session(s) should cover:

- surgical options, their differences and the general indications
- realistic outcomes
- risks involved
- importance of follow up and the lifestyle changes required for long term health improvements.

Importantly, this first stage of education will assist to identify patients who are not ready to undertake the comprehensive programs and changes required for successful bariatric surgery. This will avoid outpatient evaluations and appointments for these patients who instead may benefit by redirection to medical weight loss programs for assistance.

Previous experience indicates that between 15-25% of referred patients will drop out after the initial information and education session(s) meaning that this mechanism supports the efficiency of care delivery for suitable patients. Patients who have attended these sessions and still wish to pursue bariatric surgery should then progress to a formal "preconditioning program," covered below.

Preconditioning education and engagement program

International evidence shows that intensive patient preconditioning (including educational coursework and counselling) results in better outcomes (117 p. 109; 118 p. 110). An Australian prehospital education pathway, including a preconditioning education program at the Alfred Hospital in Melbourne (119 p. 111) demonstrated improved weight loss outcomes at 12 months as well as significantly lower failure-to-attend rates at the first appointment, which is attributed to the recruitment of patients who are more engaged. The Austin Hospital in Melbourne has seen similar results after adoption of the program from the Alfred Hospital.

The National Framework recommends that all bariatric surgical programs use a preconditioning education and engagement program that is available to all patients prior to moving into the preoperative assessment phase. The preconditioning program should build on the initial information and education sessions to ensure continued engagement and informed decision making for patients wishing to continue to bariatric surgery. The specific composition of preconditioning programs should be tailored for local conditions and be culturally safe, and include general education on nutrition, healthy eating, obesity and its effects and treatment.

The preconditioning program allows patients to consider other treatment options if they are unable to adequately prepare for bariatric surgery or undertake the recommended follow up procedures. This provides reassurance that the National Framework delivers bariatric surgery to those patients most likely benefit, reducing inefficiency and unproductive use of resources.

The preoperative education pathway and preconditioning program requirements should be well documented and communicated to patients and referring doctors. Care must be taken to ensure that language and cultural differences do not form barriers that impair the ability to complete the program. These barriers can be overcome by offering various modes to convey the information (e.g. translated in multiple languages, having both soft and hard copies available etc.).

Preconditioning programs can incorporate local treatment pre-requisites noting that there is limited evidence that mandatory pre-operative weight loss improves the outcomes of bariatric surgery (120 p. 112). Treatment pre-requisites can be included if relevant to the local service team. Examples may include:

- mandatory in-house medical weight loss attempts/treatments prior to entering a surgical program
- time based pre-requisites such as minimum waiting time prior to entry into surgical program to allow appropriate preparation.

Personalised Education

After preconditioning and during the formal clinical assessment phase, opportunities exist for more detailed and personalised education for and engagement with patients as they progress to surgery. Education and engagement should come from each specialist involved in care including surgeons, nurse specialists, physicians and dietitians and psychologists where appropriate. All team members should share messages from a consistent platform to maximise the patient experience.

Preoperative assessment

RECOMMENDATION 6:

The National Framework recommends that patients that progress through the initial information and education session(s), preconditioning program and personalised education should be comprehensively assessed from a medical, surgical, nutritional, psychological and social point of view. These assessments guide management and are educative opportunities for the patient.

Preoperative assessment allows the National Framework to assess all patients against various measures to ensure they are physically and psychologically fit for bariatric surgery and guide management by appropriate healthcare professionals. Effective communication between bariatric team members is critical during this phase. The care co-ordinator or nurse specialist plays a significant role to ensure that assessments and concerns raised by individual team members are communicated to others. Regular multidisciplinary team (MDT) meetings will facilitate communication and should be held on a regular basis to facilitate co-operative patient care.

The recommended preoperative assessments are:

- medical assessment
- surgical assessment
- preoperative and anaesthetic assessment
- psychological assessment (where available)
- nutritional assessment.

Each are described in more detail below.

Medical assessment

The initial patient triage at the point of referral should include the patient's medical history, obesity comorbidities and medication use. This can be used to prompt further specialist medical evaluation. Secondary causes contributing to the patient's obesity should be considered if these have not been examined previously and may be excluded by history, physical examination and laboratory investigations. Medical assessment is directed toward identifying and, if required, treating relevant associated disease and functional impairment. This may be performed by a physician, a bariatric GP working within the team or the surgeons in liaison with a physician as required.

Recommended assessments are outlined in Table 6.

Table 6: National Framework Preoperative Medical Assessment Guide

Test	Indication
Comprehensive medical history: cardiac disease, hypertension, diabetes, hypertension, significant sleep disordered breathing, mental illness, contraception in women of child-bearing age	All patients
Anthropometric measurements: Hip and waist circumference, blood pressure, body composition analysis where available	All patients
Blood tests: Full blood count, urea and electrolytes, glucose, HbA1c, iron studies, 25-OH vitamin D, vitamin B12, vitamin A, folate, calcium, PTH, TSH, lipids, insulin, metabolic testing and nutritional status (including lipid profile), Prothrombin time (PT)/partial thromboplastin time (PTT)	All patients
Exclusion of secondary causes of obesity	All patients
Evaluation of specific complications of obesity: hypogonadism, PCOS	Patients with clinical suspicion
At least 2 of the following: 24-hour urine free cortisol excretion, late night salivary cortisol and 1mg overnight dexamethasone suppression test	Patients with suspected Cushing's syndrome

Test	Indication
Sleep studies	Patients with suspected significant sleep disordered breathing
Electrocardiogram	Men >40 years, women >50 years, known coronary artery disease, hypertension, diabetes
Echocardiogram and stress testing	Suspected significant cardiac disease based on clinical history and/or CVD risk calculator
Chest radiograph	Age >50 years, known or suspected cardiac or pulmonary disease

A medication history should be obtained, particularly for medications associated with weight gain or for medications which require modification (e.g. from slow release to immediate release preparations in some instances) and those not able to be taken following surgery. Consideration should be given as to whether alternative medications are available and suitable. Medication pharmacokinetics and formulations may also need to be considered depending on the proposed bariatric procedure.

Comorbidities should be managed at the point of identification. If obesity-related disease optimisation is required before surgery, patients may need to be referred to the appropriate specialists (for example, cardiologist, respiratory physician, and endocrinologist) and/or be co-managed with perioperative physicians or anaesthetic staff associated with the bariatric team.

Other medical risk factors which may require specific interventions prior to surgery are listed in Table 7 (121 p. 113). The identification of any of these medical risk factors may require a referral to the appropriate specialist for further assessment and management.

Table 7: Medical risk factors to be addressed prior to surgery

Risk factor	Intervention
Endocrine disorder	A pre-operative HbA1c < 7 should be aimed for. Consider delaying procedure if HbA1c > 9 (122 p. 114) SGLT-2 Inhibitors should be ceased 3 days pre-operatively (123 p. 115)
Cardiac risk/coronary disease	Consider beta-blockers one week pre-operatively to reduce blood pressure
Obstructive sleep apnoea (present in 39-71% of bariatric surgical patients)/other respiratory risk factors	Consider pre-operative initiation of continuous positive airway pressure (CPAP) or bi-level positive airway pressure (BiPAP) for at least 4 weeks pre-operatively to reduce hypercarbia, hypoxaemia and pulmonary artery vasoconstriction. Patients should be reminded to bring home CPAP or BiPAP devices with them on the day of surgery.
Hypercoagulability (obesity is an independent risk factor for venothromboembolic events (VTE)	VTE prophylaxis as per their risk stratification.
Non-alcoholic fatty liver disease (this is a risk factor for liver injury during surgery)	Patients should undergo a VLED regime for at least two weeks prior to surgery to reduce liver size at the discretion of the treating clinician. Note there are alternative means of achieving similar outcomes for those patients who can't tolerate VLED therapies.
Smoking	Encourage patients to quit smoking prior to surgery because continued smoking cessation is associated with increased surgical risk in both the short and long term. Liaison with appropriate local services may be required.

Surgical assessment

Surgical assessment is directed toward:

- suitability of patients for bariatric surgery in general. This includes confirmation of eligibility as well as liaising with the MDT assessments to identify any lifestyle and psychological factors such as sleep/wake cycle reversal, poor eating patterns or food choices, and psychological risk factors that may affect outcomes and should be addressed prior to wait listing for surgery
- identifying factors that may influence choice of procedure such as the presence and severity of reflux, degree and nature of co-morbidities, requirement of medications (such as NSAIDs or corticosteroids), previous abdominal surgical procedures, risk of starting smoking again in the future, and the patient health focused goals
- patient education with respect to surgical procedures, mechanism of action and risks and benefits as part of gaining informed consent
- priority allocation of surgery for that patient.

The patient's informed consent to surgery should reflect that:

- the patient fully understands the potential benefits, risks and long-term consequences associated with the procedure
- the choice of surgical intervention was made jointly by the patient and the healthcare professionals responsible for treatment, following detailed individualised assessment and discussion of risks and benefits
- the patient is engaged with the team/service and understands the recommended dietary and lifestyle changes
- the patient commits to long-term follow-up after surgery, including with their primary care team.

Perioperative and anaesthetic assessment

This pertains to assessing fitness for surgery and perioperative medical optimisation. As outlined in "Team Composition" bariatric surgical services would ideally have access to, or have team nominated, specialist anaesthetists or perioperative physicians involved in care of patients of medical or surgical complexity. In some institutions, this may be provided by a generalised service without nominated individuals.

This National Framework recommends that patients undergoing prolonged complex bariatric surgery (e.g. revisional surgery) who have severe or potentially unstable medical co-morbidity or medical complexity with metabolic comorbidities, should be assessed by the anaesthetic and/or perioperative team for consideration of high dependency unit (HDU) or intensive care unit (ICU) requirement postoperatively.

Psychological assessment

Patient screening for severe depression, untreated or undertreated mental illnesses associated with psychoses, active alcohol substance abuse, post-traumatic stress disorder, severe anxiety and bulimia nervosa is necessary to help avoid adverse post-operative outcomes.

Some psychological conditions are contraindications to proceeding with bariatric surgery (see Eligibility Criteria). Beyond this, surgery should be undertaken only after there has been evaluation of any psychosocial or other factors that may affect adherence to post-operative care requirements noting that concerns may become apparent during any of the preoperative assessment appointments or evaluation processes.

The American Society for Metabolic and Bariatric Surgery (ASMBS) recommends a number of areas for exploration in the psychological assessment for bariatric surgery patients, including (124 p. 116):

- weight history
- eating disorder symptoms (including: binge eating, night eating, compensatory behaviours, anorexia nervosa and other eating disorders)
- psychosocial history (including: psychiatric history, psychosocial functioning, developmental and family history, cognitive functioning and personality traits and temperament)
- current stressors
- social support

- quality of life
- health-related behaviours (including: substance use, smoking and adherence)
- patient motivation and knowledge (including: weight loss expectations, motivation to engage, and knowledge of surgical procedures, risks and benefits).

The high rate of mental health conditions among people who live with clinically severe obesity is well documented, although the cause and effect relationships may be less clear (47 p. 42). While patients with psychiatric and psychological disorders should not be excluded from bariatric surgery, clinicians should take into account the fact that people with diagnosed schizophrenia, bipolar disorder and/or personality disorders are reported to have sub-optimal surgical outcomes without appropriate psychiatric support (58 p. 54). Further, patients must be able to give fully informed consent to bariatric surgery and commit to post-operative care plans.

The accessibility of psychologists for psychological assessment of patients undergoing bariatric surgery may be challenging in a public or regional service centre context. However, pre-operative psychological assessment should be encouraged where possible.

Nutritional assessment

Pre-operative care for patients requires dietary education from a bariatric qualified dietitian and, where appropriate, support to change their eating habits and prevent nutritional complications from surgery. This should include advice about pre-operative dietary requirements (including VLED) and postoperative eating patterns and composition of diet required for maintenance of adequate nutrition and long-term weight loss and health improvement outcomes. Nutritional parameters should be assessed and deficiencies corrected preoperatively, particularly iron, vitamin B12 and vitamin D.

4. Surgery

RECOMMENDATION 7:

Institutions are encouraged to develop expert and consistent theatre teams to conduct bariatric surgery and appropriate patient care

There is good evidence that whilst patients with obesity represent a higher risk population for surgery, bariatric metabolic surgery can be achieved safely with low morbidity and mortality risk, as outlined in Section 1. The preoperative pathways are aimed at risk reduction. When adequately standardised, these, with assessment pathways can ensure readiness for surgery to facilitate optimal outcomes.

The choice of procedure and consent process should be well documented pre-operatively. Choice of procedure for an individual patient is a complex decision governed by the clinical needs of the patient, as well as their medical history and social context (geographical, work, lifestyle). Added to this is consideration of the available clinical skillset and supports of the healthcare team. Ultimately, the patient and the treating healthcare team need to assess the risk-benefit profile of the available treatment options. What is important from a service point of view is that patients have appropriate access to the available options and that as best as possible, the procedure is matched to the health profile and needs of the patient. A “one size fits all” approach is unlikely to yield optimal outcomes.

ANZMOSS provides credentialing guidelines, however, each hospital retains responsibility to ensure appropriate accreditation. Surgeons and hospitals providing bariatric surgery services are encouraged to develop consistent and expert theatre teams including anaesthetic staff who are familiar with bariatric procedures and the care of the bariatric surgical patient.

Surgery should be conducted by appropriately trained general, upper gastrointestinal or bariatric surgeons. Public hospitals providing bariatric services must also ensure that the equipment required and appropriate to the procedure being performed are available and in good condition. When conducting the operation if a procedure is expected to be difficult or contain non-routine elements, this should be communicated to the team prior to commencement. Some additional considerations for bariatric surgery include:

- standardised anaesthetic approaches and pathways to preoperative fasting, analgesia, fluid administration and anaesthetic agents may form part of an enhanced recovery program.
- in-service education of nursing scrub staff, technicians, anaesthetic nursing and recovery staff should be encouraged both to enhance understanding of obesity and bariatric surgery and reduce stigma as well as optimise direct surgical care.

5. Postoperative care

Postoperative care in the perioperative period

RECOMMENDATION 8:

The National Framework recommends that surgical services develop standardised postoperative care pathways that consider the procedure undertaken, the probability of complications, patient progress and others involved in postoperative care to provide a template for treating teams.

Standardised perioperative care pathways contribute to enhanced recovery and early detection of potential complications by highlighting variance from expected course. These pathways should consider postoperative analgesic regimens that minimise gut dysfunction and encourage early mobilisation. Return to oral intake processes, DVT prophylaxis and the use of postoperative imaging and pathology may also be standardised.

Treating teams are encouraged to develop standardised perioperative care pathways suitable to local conditions and surgical preferences and provide appropriate in service and education for ICU, ward and unit staff to familiarise all care givers with pathway details.

Discharge planning should include the development of a post-admission care plan and written patient information, and liaison with the patient's referring or bariatric-trained GP and other community providers that will be involved in the patient's care.

Post-operative longer-term care

There is evidence of sub-optimal outcomes for bariatric surgery patients who do not receive appropriate postoperative care (58 p. 54). Current clinical guidelines indicate that bariatric patients should be regularly evaluated after surgery and that a long-term commitment from both the patient and the bariatric surgical team is required. Multiple consensus guidelines on bariatric surgery agree that care is required over the lifetime of the patient but provide varying recommendations about the frequency of follow-up (125 p. 117; 126 p. 118) (127 p. 119) (127 p. 113).

Poor postoperative follow up care can contribute to severe physical and psychological consequences including weight regain, depression, nutritional deficiencies, osteoporosis, the onset of new addictive behaviours (such as Alcohol Use Disorder), anaemia and infrequently, death. Appropriate support after surgery (including psychological screening, dietary advice, and specialist physical activity) can help maximise the health benefits of bariatric surgery (128 p. 120).

In practice, the frequency of follow-up visits should be adapted to the procedures undertaken, the probability of complications, the patient's progress and the degree of involvement in aftercare that the patient's GP or referring specialist is able to provide. It is also critical that there is bidirectional communication between all healthcare professionals involved in the patient's care. Follow up tends to be more frequent in the first 12 months after surgery as this is the period of greatest adjustment and learning for the patient. It is important during this time that the team works with the patient to establish mindful eating patterns, sustainable healthy lifestyle habits and exercise, and the consumption of appropriate vitamin supplements.

The National Framework recommends that at a *minimum*, the following postoperative follow up points are adopted for bariatric procedures. The recommended time frames may vary by procedure performed, institutional experience and available resources.

- postoperative recovery check (e.g. 2 weeks)
- early dietitian review (e.g. 2 to 8 weeks)
- clinical review (e.g. 3 and 6 months, then 6-monthly to two years)
- dietetic review (e.g. 3 to 6 months, and annual review thereafter).

Postoperative follow up should incorporate bi-annual then annual metabolic and nutritional blood screening as shown in Table 8 below.

Table 8: Postoperative follow up screening

Item	Significance	Measurement	Management
Blood parameters	Poor intake, poor absorption or blood loss	FBC, iron studies, vitamin B12, coagulation studies, folate measurements 6-12 monthly.	Improving diet, oral or parenteral supplements
Thiamine	Poor diet, poor intake, vomiting, alcohol intake.	Should be measured in patients with excess weight loss, vomiting, drug and alcohol use.	Oral or parenteral supplements + correction of underlying problem.
Electrolytes.	Renal function, blood chemistry.	UEC 6-12 monthly.	Correction of underlying issues with hydration and renal function.
Liver function, glucose, lipids and thyroid tests	Blood protein and markers of liver injury.	LFT 6-12 monthly Baseline glucose and HbA1c tests in those with type 2 diabetes then glucose 3 monthly, HbA1c 6 monthly (depending on the level of glycaemic control) Lipids 6 monthly (or more with changes to medication) TFT annually (or 6 monthly if on thyroxine or if there are changes to medication)	Depends on the abnormalities discovered.
Markers of bone health	Changed diet, reduced calcium absorption, increased calcium loss, hormonal changes can lead to decreased bone density and increased fracture risk.	Calcium, phosphate and magnesium estimation 6-12 monthly 25-OH Vitamin D +/– PTH Baseline DEXA BMD, then 2-3 yearly	Supplements, normalise levels, increase weight bearing and resistance exercise. Increase screening for bone loss.
Fat soluble vitamins	In patients with significant intestinal bypass or intestinal disease (i.e. not sleeve or short limb gastric bypass)	Vitamin A, vitamin E measurement 6-12 monthly. If these results come back abnormal, seek vitamin K measurement.	Oral or parenteral supplementation.
Mineral estimates	In patients with significant intestinal bypass, intestinal disease and/or very poor diet. And lethargy for which no other cause has been found.	Selenium, zinc, copper, chromium.	Oral supplements

Nutrition and exercise

Patients undergoing bariatric surgery should receive ongoing postoperative education and counselling aimed at optimising their weight management, metabolic health and overall wellbeing and function. This should include behaviour change strategies to increase physical activity levels, improve and maintain nutritional quality and eating behaviour so as to maximise the health benefits of surgery. A lifetime of additional vitamin and mineral supplements is usually required and monitoring nutritional parameters is important as some of the nutritional deficiencies can take years to develop however, can have serious irreversible sequelae. Long term weight loss maintenance is critically dependent on the maintenance of appropriate eating patterns and regular follow up (121 p. 113).

Exercise is also an important element of patient self-care (129 p. 121). Any weight loss program that results in losing large amounts of weight may also cause loss of lean body tissue including muscle mass and bone thinning. The most effective way to minimise muscle loss is through weight bearing and resistance exercise (130 p. 122). The focus is on improving overall physical and emotional wellbeing, as well as preserving lean body tissue, improved insulin sensitivity, and improvement in cardiac fitness. Where necessary, an accredited clinical exercise physiologist may need to support patients through a graded exercise plan. Whilst this may be beyond the resources of all surgical services, all hospitals providing bariatric surgery should consider community programs that may be suitable.

Medication management

Clinicians should monitor the medication of their bariatric surgery patients both before and after the surgery takes place. Medication management considerations include:

- preoperative medication management: clinicians must provide advice on which medications need to be ceased prior to bariatric surgery and when they can be restarted
- postoperative medication management: clinicians need to stop medications that affect renal function if the patient's oral intake is poor or low. Furthermore, psychotropic medications need to be reviewed at regular intervals by a specialist starting at three months or earlier if clinically indicated as some can be affected by rapid weight changes.

Psychological support

The relatively high rate of co-existing anxiety, depression and other mental illnesses in people living with obesity, means that some patients may benefit from psychological support. Practitioners should be cognisant that the major life change induced by bariatric surgery can act as a stressor, even when medical and physical outcomes are progressing well. As such, it is recommended that such patients should not discontinue their medication during the first year after bariatric surgery. Such patients may benefit from more intensive psychological support (131 p. 123; 132 p. 124).

Emotional eating, whilst often recognised and well managed initially by bariatric dietitians, nonetheless may require formal psychological input or CBT for ongoing management. In addition, bariatric surgery-induced eating changes can at times create a sense of loss and bereavement (e.g. pleasure of eating), or affect the patient's socialisation. In such circumstances patients may benefit from more intensive psychological support (131 p. 123; 132 p. 124).

Some patients may require emotional support through the post-surgical changes in body image and personal relationships. Post-operative counselling and mental health support should be available if required. Post-surgical care may include providing information on, or planning for, reconstructive operations (such as apronectomy) after weight stabilisation for certain patients, although this could also occur through private surgical referral.

A small minority of patients may experience more serious psychosocial difficulties after surgery, such as increased depression, suicidality, or substance abuse (133 p. 125). CBT groups or referral to a psychiatrist provide the opportunity for assisting those patients who develop these more serious psychological symptoms.

Follow up care models

Increasingly, the model of obesity care is likely to shift toward combined medical and surgical treatments and institutions seeking to establish services should be cognisant of this. Composition of follow up clinics may vary; however all must have integrated access to bariatric surgical expertise, specialist bariatric dietetics and specialist medical/bariatrician expertise. Liaison referral to psychology support services or embedded psychology support is desirable.

Linkages to primary care

Whilst surgery carries a commitment to offer life-long support to bariatric surgical patients, it is important that bariatric surgery teams work with community-based providers. Coordination of care with the patient's usual GP is associated with better long-term outcomes from bariatric surgery. Primary care practitioners have a key role in reinforcing and supporting their patients' post-surgical dietary requirements (including vitamin, mineral, and possibly liquid protein supplementation) exercise and dietary changes as well as monitor the patients for longer-term complications. "Shared care" programs are beneficial as they encourage and support GPs to provide ongoing care of surgical patients beyond year two and seek the assistance of the surgical service if required (134 p. 126). Detailed educational packages for GPs for the care of the surgical patient should be provided in such programs and "fast track" access to consultation with the surgical service at request of the GP, akin to shared antenatal services and fast track services and algorithms. The proposal of shared care model development is based on that of other chronic disease processes and health conditions such as type 2 diabetes and asthma.

Such linkages or shared care programs are also important in regard to the effective utilisation of hospital resources, allowing more new patients to be treated. Many of the ongoing support and care needs of bariatric surgery patients can be met in primary and community settings, and these options should be pursued wherever possible and appropriate. This will also be beneficial to patients as there will be less travel involved and less time off work to facilitate attending medical appointments.

The National Framework for Clinical Obesity Services offers practical steps and recommendations to enable the adoption and nationwide implementation of the above described linkages to primary care (9).

6. Revisional surgery

Revisional surgery refers to surgical interventions for patients who have had a previous bariatric procedure. There are several reasons revisional surgery may be required. These include:

- symptoms, side effects and complications of primary surgery
- amelioration of effect or poor response (weight regain or insufficient weight loss and/or disease remission)
- both side effects and amelioration of effect.

Whilst rates of revisional surgery vary with procedure type and individual approaches to surgery, the chronic nature of obesity means that some patients will inevitably require revisional surgery.

Public hospital services offering bariatric surgery must plan for and accommodate a modest rate of revisional surgery both of their own (institutional) patients or community (legacy) patients.[18] This must be balanced against the need for providing adequate opportunity for untreated patients accessing primary surgery. Bariatric surgical services must ensure the indications for revisional surgery are well defined and documented to limit the possibility for unnecessary surgery. It is noted that some services may not offer revisional surgery where the indication is for additional weight loss alone if caseload is likely to be prohibitive and deny access to patients seeking primary surgery.

RECOMMENDATION 9:

The National Framework recommends that public hospital services offering revisional bariatric surgery should be guided by the following principles:

- the indication for and desired outcome of revision should be clearly elucidated and documented
- the proposed outcome should be realistically achievable
- institutional or legacy patients should have equal access potential to revisional surgery without positive or negative prejudice and be subject to the same eligibility and prioritisation criteria
- priority should be allocated by indication, as below in descending order:
  - severe side effects and/or complications not adequately managed by other means
  - metabolic issues including recurrence or insufficient amelioration of disease[19]
  - weight regain or poor weight loss[20]
- all patients for whom revision surgery is being considered should be discussed in an MDT meeting with both appropriate medical and surgical expertise available and consensus treatment approach adopted
- where appropriate dietetic, psychological and lifestyle counselling and intervention should be maximised and further surgery only considered if such measures are ineffective. The use of medical/pharmacological adjunctive therapy may also be considered.

Defining the parameters of inadequate disease control or weight regain is contentious and is likely to require individual assessment. However, with respect to predicting weight loss, generalisations can be made (e.g. typical early weight loss following bariatric surgery can range from 13.7-31.2% of total weight loss (135 p. 127). Where weight loss outcomes are within reasonable expected parameters, revisional surgery should be avoided. Patient expectations should be reoriented where required and medical adjunctive therapy be discussed as appropriate; goal setting as to weight loss outcomes is of major importance.

[18] Institution patients: those that had primary surgery within the treating service (institution patients)

Legacy patients: community patients having had primary surgery elsewhere, including the private system.

[19] This requires individual specialist evaluation

[20] There is no consensus to define this. However, weight loss that falls within parameters of expected predicted average weight loss curves are not indicated for surgery.

With respect to disease control (such as diabetes, obstructive sleep apnoea (OSA) or joint disease), clinical evaluation is required to confirm that disease is inadequately controlled and that successful revisional surgery could reasonably be expect to result in enhanced control of obesity related illnesses (136 p. 128).

7. Service model

With the National Framework's proposed end-to-end bariatric surgery service detailed above, it is critical to consider how this can be delivered effectively and efficiently in the public hospital setting. Several factors will contribute to a successful service model, including:

1. MDT composition inclusive of regular MDT meetings for case management discussions
2. defined referral sources and standardised care pathways and integrated co-operative care between streams with ready access and cross referral. Bidirectional communication and a single electronic record can enhance patient care and safety
3. health care networks to ensure surgical capacity to provide the full suite of surgical interventions as well as access to non-surgical therapies
4. facilities and equipment.

The ideal service model will operate with an integrated team of medical and surgical specialists providing access to non-surgical, surgical and combination treatments. This is important to allow:

1. referral and treatment of patients who are not suitable, not ready or not eligible for surgery or who may no longer require surgery
2. interim management of patients on surgical waiting lists
3. adjunctive medical and surgical treatments in appropriate cases (such as people who respond partially or regain weight)
4. expedient surgical pathways for patients from medical programs when medical therapy does not achieve or maintain required weight loss or control of weight-related complications.
5. flexibility for those locations and organisations where resourcing and logistics may mean a single integrated service is not practical or expedient in every institution.

Alternative service models include parallel medical and surgical services within the same institution with aligned pathways of care. In this model, each service could receive referrals directly and cross referral used appropriately. One other option is the autonomous surgical service with network links to medical service and ready access to cross refer.

Multidisciplinary team composition

There is general consensus on the need for multidisciplinary assessment and treatment in bariatric surgery (125 p. 117). Regular MDT meetings are an essential element of service delivery and decision making around patient assessment, care and management.

RECOMMENDATION 10:

The National Framework recommends that the MDT includes the following team member categories:

"Mandatory" team members who are embedded within the team and are involved in the care of every patient

- "Desirable" team members comprising speciality areas where it is ideal that an individual or core group of specialists are nominated for dedicated involvement with the bariatric team and care of the bariatric patient. However, where this is not possible due to institutional logistics, it is acceptable that the bariatric surgical service be supported by appropriately trained staff as part of the general roster of service
- "Liaison" team members, which refers to services that are important for complete care but who are reasonably accessed on an as-needs basis in a formal or semiformal arrangement. Each of the speciality services in this category should ideally be available within the institution but at a minimum be accessible through networked services, for instance through a patient's usual GP.

Available evidence and clinical guidelines for bariatric surgery suggest that a best practice care model should be based on a MDT comprising the following professionals:

Mandatory Team Expertise

- Surgeon experienced in bariatric surgery
- Medical practitioner experienced in care of patients living with obesity (Bariatric GP/endocrinologist/general physician)
- Bariatric dietitian
- Patient care coordinator (can be any team member including senior administration officer)
- Nursing specialist

Desirable Expertise

- Specialist dedicated anaesthetist(s)
- Perioperative medicine specialists (or anaesthetist)
- Clinical psychologist

Liaison Team Expertise

- Respiratory medicine
- Radiology – diagnostic and interventional

Optional

- Exercise physiologist (may be outsourced via primary care facilities using EPC care plans)

The role of this team is to ensure patients receive adequate preparation, education and support, both before, during and after the surgery. Whilst it would be ideal for each of the above disciplines to be embedded in the team and participate in multidisciplinary care, decision making, care pathway mapping and patient management, it is recognised that resource allocation may not allow for this in all circumstances.

The treatment team will also require access to the full range of expert consultants whose input may be necessary for management of comorbidities and complications such as cardiologists, gastroenterologists, respiratory physicians, plastic surgeons and diagnostic services (pathology, imaging).

Staff and skills

Health services that provide or plan to provide a bariatric surgery program must have the specialised expertise, staffing levels and skill mix required for patients undergoing bariatric surgery. Health services are responsible for ensuring that the staff providing treatment and care to bariatric surgery patients have the necessary qualifications and skills.

All healthcare professionals involved in the assessment, preparation and delivery of interventions relating to bariatric surgery must have relevant competencies and have undergone specific training. Health services must identify the staff training and development needs in relation to the general management and care of patients living with obesity during admission and as outpatients, and ensure that policies, procedures and resources are available to promote the safety of both patients and staff. A useful resource is the International Federation for the Surgery of Obesity and Metabolic Disorders' recent report, *Guidelines for Safety, Quality and Excellence in Bariatric Surgery* (137 p. 129).

Bariatric operations should be performed by surgeons who have substantial experience with the required procedures and who are working in a clinical setting with adequate support for all aspects of patient assessment, treatment and management. Bariatric surgeons should be appropriately credentialed with access to specialised perioperative

support. In credentialing and defining the scope of clinical practice for surgeons performing bariatric procedures, health services are expected to comply with relevant Department of Health's policy guidance (138 p. 130). Professional associations such as ANZMOSS may assist with providing guidelines for credentialing.

Referral sources

Bariatric surgical services are increasingly important to support internal specialist services to manage chronic diseases such as diabetes, respiratory disease, primary infertility, polycystic ovarian syndrome, degenerative joint diseases and non-alcoholic fatty liver disease where obesity is a major contributor to the development of, or, progression of these diseases. As obesity is a community prevalent disease, services should be open to community referrals from GPs and other specialists.

RECOMMENDATION 11:

The National Framework recommends public bariatric surgical services should be resourced to accept both internal and community referrals. Referrals for either medical, surgical or non-specified obesity care should be triaged and assessed and then appropriately streamed after eligibility is determined. Referral triage and assessment should be performed as follows:

- centrally by a single coordinator for medical, surgical and non-specified obesity care
- when centrally is not practical, non-centrally by coordinators of closely networked parallel services, for example, one surgical triage coordinator and one non-surgical triage coordinator
- hospitals offering a public bariatric surgical program should establish relationships with regional unserviced areas to provide access.

Health services providing a bariatric surgery program should develop written information about the program for potential referrers, including details of the referral criteria.

Care pathways

RECOMMENDATION 12:

The National Framework recommends that localised care pathways are developed by the surgical team in conjunction with liaison anaesthetics and perioperative care physicians. Medical, nursing and primary care staff should be appropriately trained and familiarised with these care pathways through regular in-servicing and upskilling.

Care pathways will allow for uniformity of care and early detection of variance that may indicate a perioperative problem (139 p. 131). This is a feature of many "enhanced recovery programs" (140 p. 132; 141 p. 133) (142 p. 134; 143 p. 135). When developing the localised care pathways, it is recognised that personal clinician preferences will vary from team to team and according to experience, however, the characteristics of the care pathways listed above should be adhered to.

Training for medical and nursing staff should draw attention to the importance of hospital staff providing a positive and supportive environment for patients undergoing bariatric procedures. Patients requiring bariatric surgery often carry a psychological burden as a result of their obesity and may have had past negative experiences with health care professionals, and so it is imperative that hospital staff offer care in an empathic and non-judgemental manner.

Health care networking and surgical capacity

Whilst there is a relationship between case volume, institutional expertise, and outcome, centralising bariatric surgery to a single institution state-wide service is unlikely to service demand efficiently given the prevalence of obesity. Such a service may become overwhelmed with demand and be unable to deliver care equitably.

Preparation for, and follow up of, patients undergoing bariatric surgery requires moderately frequent interaction with the service meaning local and regional access is important for quality and safety. If local or regional access is not

available, the alternative would be to upskill community primary health services to provide assessment for prioritised patients, and safe follow up.

A complete bariatric surgical service should be able to deliver the full suite of surgical management options including all primary operations, revisional surgery and the management of complex complications. This would include advanced therapeutic endoscopy, currently for management of complications and in the future as endoscopic interventions for obesity become established as standard treatments. This would be a "complete capability" service and would generally be offered in a tertiary or quaternary level institution.

This need does not necessitate that all services providing bariatric surgery replicate all resources or all levels of surgical complexity. Relying upon high level tertiary or quaternary centres alone to deliver bariatric surgery services is likely to be inefficient, and insufficient to meet the burden of disease and regional areas may be disadvantaged if this was set as a minimum criterion. It is vital that regional areas are well serviced given that around 35% of the population that potentially benefit from bariatric surgery reside outside a major city compared to 26% of the overall population (73 p. 67).

There is evidence that within a defined scope of practice, bariatric surgery can be safely and effectively undertaken in smaller non-ICU institutions if timely inter-hospital transfer to ICU institutions is possible when needed (144 p. 136; 145 p. 137). As such, the National Framework provides for surgical services to exist with clearly predefined lesser scope of practice suitable to local expertise and infrastructure. Importantly, these services should be formally linked to other institutions by documented agreement to allow a complete service between them (see Appendix E).

In cases where patients assessed by a surgical service are deemed ineligible for bariatric surgical intervention, pathways for referral to non-surgical services should exist. These pathways could exist either within an institution or amongst a formalised network of services.

RECOMMENDATION 13:

The National Framework recommends the following health care networking principles for bariatric surgical service delivery:

- institutions and services should be formally networked by agreement to provide for a "complete capability" service between them
- networked services deliver streamlined care though standardised processes recommended in this National Framework including preoperative assessment, preparation and postoperative care such that patients assessed at any service within the network and cross referred need not undergo reassessment
- parameters of "informed consent" processes are standardised between institutions such that patients receive information on all suitable options, including those not offered by the individual institution, and be appropriately referred on as a priority if required. This requires standardised agreements and educational materials between services
- streamlining access to specialised services between institutions if required – e.g. interventional radiology
- networked institutions meet at least twice annually to audit and optimise service delivery.

The formation and allocation of such networks may be facilitated by state/territory government support or driven by collegiate relationships but ideally will be regionally bound. It is important that regional and country areas have local and regional bariatric surgical services available and where required appropriate support by larger institutions in defined care pathways. Additionally, it may also be plausible for services to negotiate with private centres to contract out bariatric procedures in the initial phases of offering bariatric surgical service.

Facilities and equipment

Health services that provide bariatric surgery must have appropriate facilities and equipment. This includes appropriate consultation rooms, operating room tables, instruments, furniture, bathrooms and radiology equipment to provide safe and dignified treatment and care for patients living with clinically severe obesity.

RECOMMENDATION 14:

The National Framework recommends all institutions offering bariatric surgery comply with the following minimum facility and equipment requirements at any institution providing bariatric surgical care:

- wide (armless) chairs that safely accommodate larger patients
- ward beds and examination couches weight-rated appropriately
- scales that weigh above 250 kilograms and have a wide base
- toilets that are not wall suspended and have rails capable of supporting weight above 250 kilograms
- operating tables with higher weightings and the ability to be extended to accommodate lateral spread
- appropriate surgical instruments (e.g. long-length surgical instruments)
- advanced radiology resources including 24-hour interventional radiology services
- x-ray and CT equipment that can cope with patients who weigh over 250 kilograms[21]
- appropriate equipment for patient transfer
- HDU, extended recovery or monitored beds
- emergency (out of hours) theatre access
- Large cuff sphygmomanometers
- Suitably sized hospital gowns
- endoscopy.

In reality, institutions that do not provide specific bariatric surgical services have already adopted such measures to manage patients with overweight and obesity already presenting to general services in the hospital. Beyond this, services and facilities required are proportional to level of patient acuity and level of complexity of surgery to be offered.

An institution of lower acuity service must be networked to one with the facilities outlined under Health Care Network Requirements, which includes ICU, interventional radiology and the emergency department.

[21] If having equipment of this capacity is unsuitable for a particular institution, patients can be referred to another facility in its network with appropriate weight capacity.

8. Data collection

RECOMMENDATION 15:

The National Framework recommends collection of at least a minimum unified dataset that outlines which data should be collected for bariatric surgery patients, with the expanded unified dataset as an option to collect more complete data.

All public bariatric surgical services must:

- contribute to the National Bariatric Surgery Registry (BSR)
- maintain a database allowing minimum outcome dataset reports
- ideally be able to provide data pertaining to waiting times and process.

The recommended unified dataset balances comprehensive data collection for assessment of quality, safety and efficacy, against clinical needs and resources. The required data is designed to be easy to collect, yet have enough detail to gain meaningful outcomes for patients and may evolve over time in line with standardised data collection recommendations made for specialist obesity management clinics in Australia (146 p. 138).

Table 9 and 10

Table 10 below list the minimum and expanded dataset required for collection as per the National Framework.

Table 9: Unified dataset – minimum

Patient demographic information	Patient clinical and lifestyle details at baseline	Weight-related complications at baseline	Blood tests (fasting) at baseline	Procedural information	Perioperative Adverse events	Outcomes (postoperative)
• Hospital UR number • Family name • Given name • Date of birth • Sex • Consent site • On-going care surgeon • Address: Street number and name, suburb, state, postcode, country • Medicare number • DVA number (if applicable) • Indigenous status • Phone numbers (home and mobile of patient and next of kin) • Vital Status • Socioeconomic status • If deceased: • Date of death • Cause of death • Death related to procedure • Ethnicity • Employment status	• Height • Weight (day of decision made to undergo surgery) • Weight (day of surgery) • Hip and waist circumference • Blood pressure • Current medication • Medication history • Lifestyle risk behaviours (smoking status, alcohol intake, physical exercise etc.)	• Type 2 diabetes treatment (select all which apply): – Diet alone – Oral medications (provide number of agents) – Insulin – GLP-1 agonist • Obstructive sleep apnoea, CPAP use • Hypertension status and number of medications used (e.g. 0,1,2,3,4+ agents) • DSM-5 eating disorders: – Depression – Anxiety – Schizophrenia – PTSD – Bipolar disorder – BED – Other • Musculoskeletal disease (e.g. back pain)	• Liver function tests (ALT, AST, GGT) • Renal function tests (creatinine, eGFR) • HbA1c/glucose • Lipids (total cholesterol, triglycerides, HDL, LDL) • TSH	• Operation date • Operation status (primary/revision) • Type of procedure: – Lap band – Sleeve – RYGB – MGB-OAGB – BPD/DS • Endoscopic – describe • Other – describe • Mode: – Open – Laparoscopic – Endoscopic – Other • Concurrent liver transplant • Concurrent renal transplant • Device type • Device brand • Device model • If stapling – buttress Type • Length of hospital stay • If revisional surgery: – Most recent bariatric procedure – Planned or unplanned (If	• Follow up date • Defined adverse event (if yes, reason for event) • Unplanned return to theatre • Unplanned ICU admission • Unplanned re-admission to hospital • Vital status • If deceased: – Date of death – Cause of death – Death related to procedure Y/N	• Weight, BMI, hip and waist circumference at 3, 6, 12, 18, 24 months then yearly • Data listed under weight-related complications at 6 and 12 months, then yearly • Data listed under blood tests (fasting) at 3 months then yearly • yearly – adverse events: • Date of follow up • Reoperation in last 12 months? If yes, provide reason • Vital Status • If deceased: – Date of death – Cause of death – Death related to procedure Y/N

Patient demographic information	Patient clinical and lifestyle details at baseline	Weight-related complications at baseline	Blood tests (fasting) at baseline	Procedural information	Perioperative Adverse events	Outcomes (postoperative)
				unplanned, provide reason)		

Table 10: Unified dataset – expanded (in addition to minimum)

Patient weight history	Patient clinical and lifestyle details at baseline	Weight-related complications at baseline	Blood tests (fasting) at baseline	Outcomes

• Had overweight since:
  – Childhood
  – Adolescence
  – Adulthood
• Heaviest weight in adulthood (not including pregnancies)
• Previous non-surgical weight loss attempts/treatments: (select all which apply):
  – Self-directed dieting
  – Commercial program
  – Dietitian or medical guided
  – Supervised exercise
  – Medication
	• Body composition analysis
	• Addictions and/or substance use
		• Cancers
		• Cardiovascular disease/stroke
		• Depression
		• Dyslipidaemia
		• Gastroesophageal reflux
		• Osteoarthritis
		• Polycystic ovary syndrome/infertility/male hypogonadism
		• Functional limitation
		• Dyspepsia/GORD
			• Vitamin D (25-OH vitamin D, PTH)
			• Calcium
			• Nutritional measures:
			  – Folate
			  – Full blood examination
			  – Iron studies
			  – Vitamin B12
			  – Other
			• C-reactive protein (CRP)
			• Sex hormones (testosterone, SHBG)
			• Uric acid
				• Data listed under weight-related complications at 6 and 12 months then yearly
				• Data listed under blood tests (fasting) at 3 months then yearly
				• Substance use (alcohol, smoking, illicit)

Appendix A: Taskforce members and participating organisations

Taskforce members and affiliated organisations

Name	Affiliated organisation(s)	Discipline
Ahmad Aly	ANZMOSS | Austin Hospital	Surgeon
Alison Venn	Menzies Institute for Medical Research, University of Tasmania	Epidemiologist
Amy Kimber	Royal Australasian College of Surgeons	Administrative
Andrew MacCormick	University of Auckland	Surgeon / Academic
Anthony Clough	Box Hill Hospital	Surgeon
Ben Dodd	Royal Brisbane Hospital	Surgeon
David Fletcher	Medical Services Advisory Committee | Royal Australasian College of Surgeons	Surgeon
David Martin	Concord Hospital	Surgeon
David Yong	Joondalup Health Campus	Surgeon
Evan Atlantis	Clinical Obesity Services in Public Hospitals | National Association of Clinical Obesity Services	Researcher / Academic
Fiona Sammut	Austin Hospital	Dietetics
Georgia Rigas	Royal Australian College of General Practitioners	Primary Care
Girish Pande	Launceston Hospital	Surgeon
Ian Caterson	Obesity Australia | World Obesity Federation	Physician
Jacob Chisholm	Flinders Medical Centre	Surgeon
Jarryd Walkley	Austin Hospital	Nursing
Jeff Hamdorf	The University of Western Australia	Surgeon
John Dixon	Baker Heart and Diabetes Institute | Australian & New Zealand Obesity Society	Physician / Academic
Josie Hill	Australian Medical Association	Policy
Michael Talbot	ANZMOSS | St George Hospital	Surgeon
Nic Kormas	Concord Hospital | Camden Hospital | Campbelltown Hospital | National Association of Clinical Obesity Services | Australian & New Zealand Obesity Society	Physician
Nick Williams	Wagga Wagga Hospital	Surgeon / Rural Care
Priya Sumithran	Austin Hospital | Australian & New Zealand Obesity Society	Physician
Salena Ward	St Vincent's Hospital Melbourne | Box Hill Hospital	Surgeon
Samuel Baker	Townsville Mater Hospital	Surgeon
Tim Davis	Medical Services Advisory Committee	Policy
Wendy Brown	Alfred Health | Monash University	Surgeon

Editorial board members

Name	Position(s) held
Ahmad Aly	Head Upper GI Surgery Austin Hospital | Clinical Associate Professor University Melbourne | Past ANZMOSS President
Evan Atlantis	Senior Lecturer, School of Nursing and Midwifery | Translational Health Research Institute, Western Sydney University | NACOS President
Georgia Rigas	Senior Bariatric Medical Practitioner St George Private Hospital, Sydney | Royal Australian College of General Practitioners Specific Interest in Obesity Management Network Chair (or RACGP Specific Interest in Obesity Management Network Chair)
Ian Caterson	Director, Boden Collaboration, Charles Perkins Centre, University of Sydney | Director, Charles Perkins Centre Royal Prince Alfred Clinic | Deputy Clinical Stream Director, Aged Health, Chronic Care, Andrology & Disability, Ambulatory, General Medicine, Endocrinology & Rehabilitation, SLHD | Past-President, World Obesity Federation
Jeff Hamdorf	Director of Clinical Training and Evaluation Centre and Professor of Surgical Education, The University of Western Australia | President-Elect ANZMOSS
John Dixon	Professorial Fellow, Clinical Obesity Research, Baker Heart and Diabetes Institute | Adjunct Professor at the Iverson Health Innovation Research Institute, Swinburne University, and Primary Care Research Unit Monash University
Michael Talbot	ANZMOSS President
Nic Kormas	Senior Staff Specialist at Concord, Camden and Campbelltown hospitals
Nick Williams	Endocrine, Upper Gastrointestinal and Obesity Surgeon, Wagga Wagga Hospital | Secretary and Treasurer, NACOS
Priya Sumithran	Endocrinologist, Austin Health. Senior Research Fellow, University of Melbourne | Council Member, ANZOS
Salena Ward	Upper GI and Bariatric Surgeon at St Vincent's Hospital Melbourne and Box Hill Hospital
Wendy Brown	Professor and Chair, Monash University Department of Surgery, Alfred Hospital | Director, Oesophago Gastric and Bariatric Unit, Alfred Health | Clinical Director, Australia and New Zealand Bariatric Surgery Registry | Immediate Past President ANZGOSA

Collaborating organisations

The below collaborating organisations have provided input and support for this Framework, and are in agreement with the principles discussed regarding public access to bariatric surgery:

- Australia & New Zealand Obesity Society (ANZOS)
- National Association of Clinical Obesity Services (NACOS)
- The Obesity Collective

Appendix B: Glossary

AHI	Apnoea-hypopnea index
ALT	Alanine aminotransferase
ANZMOSS	Australian and New Zealand Metabolic and Obesity Surgery Society
AST	Aspartate aminotransferase
BiPAP	Bi-level positive airway pressure
BMD	Bone mineral density
BMI	Body mass index
BPD	Biliopancreatic diversion
BSR	Binational (Australia and New Zealand) Bariatric Surgery Registry
CBT	Cognitive behavioural therapy
CPAP	Continuous positive airway pressure
CRP	C-reactive protein
CXR	Chest X-ray
DEXA	Bone mineral densitometry
DS	Duodenal switch
DVA	Department of Veterans' Affairs
DVT	Deep vein thrombosis
E2	Estradiol hormone
eGFR	Estimated glomerular filtration rate
EOSS	Edmonton Obesity Scoring System
EPC	Enhanced primary care
FBC	Full blood count
Fe	Iron
FSH	Follicle stimulating hormone
GGT	Gamma glutamyl transferase
GLP-1	Glucagon-like peptide-1
GORD	Gastro-oesophageal reflux disease
GP	General Practitioner
HbA1c	Haemoglobin A1C
HDL	High-density lipoprotein
HDU	High dependency unit
ICU	Intensive care
IHD	Ischaemic heart disease
IIH	Intracranial hypertension
LAGB	Adjustable gastric banding
LDL	Low-density lipoprotein

LFT	Liver function tests
LH	Luteinizing hormone
MDT	Multidisciplinary team
MGB-OAGB	Mini gastric bypass - one anastomosis bypass
NAFLD	Non-alcoholic fatty liver disease
NASH	Non-alcoholic steatohepatitis
nCPAP	Nasal continuous positive airway pressure
NHRMC	National Health and Medical Research Council
NHS	National Health Service
NIH	National Institutes of Health
NSAID	Non-steroidal anti-inflammatory drugs
OECD	Organisation for Economic Co-operation and Development
OH Vit D	Calcifediol
OSA	Obstructive sleep apnoea
PT	Prothrombin time
PTH	Parathyroid hormone
PTT	Partial thromboplastin time
RCT	Randomised control trial
RYGB	*Roux-en-Y* Gastric Bypass
SADI-S	Single anastomosis duodeno-ileostomy with sleeve gastrectomy
SG	Sleeve gastrectomy
SHBG	Sex hormone binding globulin
SIPS	Stomach intestinal pylorus-sparing surgery
SOS	Swedish Obese Subjects Study
T2DM	Type 2 diabetes
TFT	Thyroid function tests
UEC	Urea, electrolytes and creatinine
VBG	Vertical banded gastroplasty
VLCD	Very low calorie diet
VLED	Very low energy diet
VTE	Venous thromboembolism
WHO	World Health Organisation

Appendix C: About obesity

Causes and consequences of obesity

Obesity with health impairment is a chronic disease characterised by excessive body fatness, which has genetic predisposition (147). The excessive accumulation of fat not only causes physical health problems for individuals living with obesity, but also metabolic health problems given that fat cells (adipose tissue) are part of the body's endocrine system. Furthermore, the psychosocial sequelae should not be overlooked given they traverse across numerous domains including those of personal self-esteem and body self-image, relationship with others, general interactions and standing in the wider community and in the workplace including unequal employment opportunities, less provision for career advancement/promotion etc.

Obesity is a disorder of energy balance in which energy stores in the body, especially the adipose tissue, are increased due to increased energy intake and/or reduced energy expenditure. Therefore, in genetically predisposed individuals, today's "obesogenic environment" which includes but is not limited to sedentary lifestyles and the ready availability of energy dense food has contributed to the obesity epidemic. However, at the individual level obesity results from a complex interplay of genes, environment, epigenetics, eating habits, sedentary behaviour and psychosocial factors (148 p. 139). Net calorie surplus that can result for individuals whose food intake exceeds their caloric expenditure provides a simplistic and plausible explanation for weight gain. However, this explanation falls short in many ways. Multiple factors are found to influence obesity occurrence including economic, political, psychosocial, sociocultural, reproductive, chemical, and iatrogenic factors (149 p. 140).

Overwhelmingly, genetics and other heritable factors are being found to play a crucial role (150 p. 141; 151 p. 142). Not everyone develops obesity when placed in an obesogenic environment, and there is evidence that genetic predisposition is important in the development of obesity. Studies on identical and non-identical twin pairs either reared together or reared apart suggest that approximately 70% of the influence on body weight is genetic while approximately 30% is environmental (152 p. 143; 153 p. 144). Adoption studies have shown that adoptees resemble their biological parents in body size and fat distribution, and have very little body size/body fat resemblance to their adopted parents (154 p. 145). This strongly supports the strong influence that genetics exert compared to the environment.

Some of the genes that could predispose people to developing obesity have been identified (155 p. 146) but there are likely to be many more as yet undiscovered. Of considerable interest is that many of the genes discovered so far that can cause obesity, do so by increasing hunger.

There is now evidence that weight is both regulated and defended tightly, largely through appetite regulation. This makes weight loss difficult and weight loss maintenance exceedingly difficult for most. There is a vigorous reaction to weight loss by the body's regulatory processes, including reduction in metabolic rate (156 p. 147), increases in hunger driving hormones such as ghrelin (157 p. 148) and reduction in hunger inhibiting hormones such as leptin (158 p. 149; 159 p. 150). Gut hormonal changes occur reducing satiety and increasing appetite and are sustained during the period of weight loss until weight is restored (160 p. 151). Hence, after dieting and weight loss, people are hungrier and have a lower metabolic rate than when at their stable higher weight. Body weight is defended by driving hunger until body weight is restored: the often proposed remedy of simply to "eat less and move more", usually fails to produce lasting results because it ignores the body's own homeostatic regulatory control over body weight via the hypothalamus vigorously defending the "set point" and upregulating appetite (161 p. 152). It should be noted that unlike the cerebral cortex, the hypothalamus part of the brain is not under voluntary control.

Thus, obesity is the result of genetic predisposition (genetic loading) and gene programming (environmental loading) plunged into an "obesogenic environment" encouraging its expression (trigger). The "genetic loading and early programming" determines the individuals' physiology for weight homeostasis as described above. The "set point" of weight may up-regulate allowing individuals to get heavier with time but does not appear to naturally down-regulate.

The role of epigenetic change altering genetic activation and expression is being increasingly recognised. Epigenetic marks that occur at the individual level can directly and indirectly influence the heritability of obesity to subsequent generations (162 p. 153). Therefore, parental obesity increases the risk of obesity in their offspring (163 p. 154). This has profound implications. The rise in childhood obesity potentially fuels even greater rises in the following generations. Early interventions such as weight reduction in future fathers and yet to conceive future mothers, and in the treatment of children/adolescents living with obesity may counter this. There is evidence that children of mothers that have had bariatric surgery to treat obesity prior to pregnancy, are less likely to develop obesity than children of untreated women living with obesity (164 p. 155).

It is imperative that we recognise that hitherto treatments for obesity may also have an impact in prevention of further obesity in future generations (165 p. 156).

Measuring obesity

Overweight and obesity, defined as abnormal or excessive fat accumulation, is most commonly documented using body mass index (BMI)[22]. Whilst there are limitations to measuring obesity using BMI alone, there is an association between an increasing BMI and health risk. Other factors, such as the pattern of distribution of body fat are important in conferring risk, for example, central distribution of body fat, indexed by waist circumference, is a predictor of health risk.

Table 11 shows the widely accepted weight classifications based on BMI with different classes of obesity. It should be noted that different BMI and waist circumference thresholds are used for certain cohorts (see Table 2).

Table 11: Weight classifications based on body mass index[23]

Classes	BMI	Risk of comorbidities
Normal weight	18.5-24.9	Normal
Overweight	25-29.9	Increased
Class I Obesity	30-34.9	Moderate
Class II Obesity	35-39.9	Severe
Class III Obesity	Above 40	Very severe

Table 12: National Health and Medical Research Council (2013) Clinical practice guidelines for the management of overweight and obesity in adults, adolescents and children in Australia (166 p. 157)

Patient Groups	Distribution of fat	BMI (kg/m^2) thresholds
Aboriginal people	High limb to trunk ratio	Lower
Pacific Islander populations (including Torres Strait Islander peoples and Maori)	Higher proportion of lean body mass	Higher
South Asian, Chinese and Japanese population groups	More body fat at lower weights	Lower, e.g. >23
People with high muscle mass (e.g. athletes)	Lower proportion of body fat	Higher

[22] BMI = Weight/Height^2 (kg/m^2)

[23] These reference ranges are specific for Caucasian populations. Other reference ranges exist for different ethnicities.

Patient Groups	Distribution of fat	BMI (kg/m^2) thresholds
Older individuals	More body fat than a younger individual at the same BMI	Lower

The term “clinically severe obesity” reflects the impact of obesity upon health and longevity (167 p. 158), and is generally used to describe obesity of BMI greater than 40 or between 35 and 40 with associated major medical conditions such as diabetes, some cancers and premature death.

The prevalence of overweight and obesity in Australia

The 2017-18 National Health Survey found that more than two thirds (67%) of Australians aged over 18 years were living with overweight or obesity, representing an increase from 63% in 2014-15 and 56% in 1995. In 2017-18, more than a third (35.6%) of all Australians were living with overweight and 31% with obesity. A greater proportion of men aged over 18 years were living with overweight or obesity than women (74.5% and 59.7% respectively) and there are a similar proportion of men and women who are living with obesity, 32.5% and 30.2% respectively (1 p. 1). However, women are overrepresented in those with severe obesity in Australia and globally (168 p. 159).

Significantly, this rise is attributable to more severe forms of overweight, with obesity (BMI>30) increasing from 19% to 28% and severe obesity (BMI>35) almost doubling from 5% to 9% during the same 10 year period between 1995 and 2014-15 (22 p. 17). Those Australians more likely to live with overweight or obesity include:

- Indigenous children and adults
- Australians living outside of major cities
- Australians who are in lower socioeconomic groups.

This information has important implications in planning treatment services.

Nearly two-thirds of adults live with overweight or obesity, and this is on the rise

More than three in five Australian adults (63%) have overweight and 28% have obesity

People living in regional areas or from a lower socioeconomic background are more likely to live with obesity.

Although the prevalence of obesity is lower in Australian children than in adults, the statistics remain concerning. 1 in 5 children (20%) aged between 2 and 4 years live with overweight or obesity, and about 1 in 4 (27%) live with overweight or obesity in the 5–17 year age group (22 p. 17). Children who develop obesity are likely to continue living with obesity into adulthood and experience greater risks of obesity related chronic diseases.

27% of Australian children aged 5 to 17 have overweight or obesity

Childhood obesity has risen 7% in 10 years

Children living in outer regional/remote areas or from lower socioeconomic backgrounds are more likely to have overweight or obesity

Children with obesity are likely to continue living with obesity into adulthood with greater risks of suffering from obesity related chronic diseases.

Burden of disease

Obesity is a major cause of numerous health problems and mortality. It is strongly linked to type 2 diabetes and is a risk factor for many other chronic conditions such as infertility, cardiovascular disease, some cancers and osteoarthritis. It is important to realise that the health impact of obesity arises from both the direct effects of weight on various parts of the body, in addition to the metabolic effects of obesity. The level of risk for both these impacts increases sharply with a BMI above 35.

Depression, low self-esteem, social prejudice and reduced work opportunities have consistently been shown to add to the burden of disease for people who are living with obesity and have a significant impact on wellbeing and quality of life. Family members may also be affected through additional caring responsibilities for individuals living with clinically severe obesity. Carers often commit substantial time which can lead to foregone earnings and impacts on quality of life (53 p. 49).

Burden of disease analyses have shown that in 2011, 7% of Australia's total burden of disease was due directly to overweight and obesity, with 63% of this contributing to fatal burden (21 p. 16). Men (7.3%) had a slightly greater burden of disease from overweight and obesity than women (6.6%) reflecting the more central distribution of body fat. One in every six days spent in Australian hospitals is related to patients with overweight and obesity for patients over the age of 45 (169 p. 160; 22 p. 17). Children with obesity have 60% higher health care costs than children of a healthy weight and are 2 to 3 times more likely to be hospitalised (170 p. 161). Additionally, obesity is thought to contribute to 16% of the health gap between Aboriginal and Torres Strait Islander people and the total Australian population (171 p. 162).

Living with overweight or obesity is associated with higher and premature mortality. A recent study of Australian and New Zealand adults with a BMI above 25 kg/m2 showed the relative risk of death from all causes increased by 31% with each 5 kg/m2 increase in BMI (172 p. 163). An investigation into the effect of obesity on life expectancy found that, compared with people with a healthy BMI, life expectancy was reduced by 2 to 4 years for people with Class I obesity (BMI >30) and by 8 to 10 years for people with Class III obesity (BMI>40) (166 p. 157).

Obesity is a contributor to, or major causal factor in, many chronic diseases including diabetes, non-alcoholic fatty liver disease (NAFLD), sleep apnoea and respiratory disease, infertility, osteoarthritis, cardiovascular disease, hypertension, stroke and several cancers including breast, uterine, ovarian, pancreas, oesophagus and colon cancers. It is estimated that obesity contributes to 40% of the cancer burden in the USA (173 p. 164). In Australia, between 2005 and 2008, obesity was a causal factor in significantly increased incidences of cardiovascular disease (70%), osteoarthritis (88%), and colorectal, breast, uterine or kidney cancer (47%) (174 p. 165).

The link between obesity and Type 2 diabetes is especially significant, with estimates showing that eliminating obesity from the population could potentially reduce the incidence of Type 2 diabetes by over 40% (175 p. 166). Diabetes is the fastest-growing chronic condition in Australia, with approximately 280 people developing the condition every day (176 p. 167). Childhood obesity increases the risk of developing diabetes by four-fold. Effective treatment of obesity results in profound improvements and at times resolution of diabetes in individuals living with obesity.

Moreover, obesity contributes a significant financial burden to society both in direct medical costs and in indirect costs such as absenteeism, government subsidies and forgone taxes. The estimated annual cost of obesity in Australia (which has doubled since 2005) is over $8 billion (174 p. 165; 53 p. 49). If costs related to health and wellbeing are included, estimates place the burden from obesity on quality and length of life at over $47 billion in 2011-12 (163 p. 154).

The 2009 Australian Government's Preventative Health Taskforce Report on Obesity (177 p. 168) correctly called for urgent action, however, since then, the prevalence of obesity has continued to increase and its burden remains. Forecasts to 2025 suggest that without significant effective intervention obesity will continue to increase in prevalence with overweight and obesity exceeding 80% of the Australian population and as many as 7 million Australians classified as living with obesity (53 p. 49).

Prevention and treatment of obesity

To make a meaningful impact on the obesity epidemic, a systems approach and a broad suite of solutions will be required for both prevention and treatment. To date there has not been substantial progress, nor sufficient political imperative for systematic change. The focus on personal responsibility, and the shaming and blaming individuals and some industries, has taken the focus off collective responsibility for obesity prevention and management. Contrary to other major global risks, there is little evidence of successful population-level intervention strategies to reduce obesity. Not only is obesity increasing, but there were no national success stories over the past 35 years (18 p. 13).

Whilst efforts must continue to find effective preventative strategies through environmental design, education and promotion of healthy living, food policy and political agency, it is imperative that treatment for the current levels of disease be optimised. As described in the section on causes of obesity, active treatment of current disease creates downward pressure on future generational incidence.

For people who already live with overweight, weight loss strategies need to address modifiable causes of weight gain such as inappropriate diet and sedentary lifestyle. Many people with overweight or obesity self-manage their weight loss regimes or seek support (such as dietary advice, exercise programs, counselling, and behavioural modification therapies) from private organisations, general practitioners (GPs) or other primary care providers. However, the effect of lifestyle and behavioural programs on weight are limited for the majority of those living with obesity (178 p. 169). Intensive behavioural or cognitive therapies delivered by a team can maximise individuals' capacity to benefit from healthier lifestyle choices.

More intensive therapies including meal replacements, very low energy diets (VLEDs), pharmacotherapy or bariatric surgery are needed by many people living with overweight or obesity to achieve and sustain clinically meaningful weight loss. An Australian obesity management algorithm has been developed based on the NHMRC guidelines but also incorporating more recent advances in obesity management, to indicate when these more intensive services and the assistance of specialised services are required (179 p. 170).

Bariatric surgery has a major role in treating a proportion of individuals with obesity who have not been able to achieve long-term weight loss through non-surgical means and whose health is compromised or at significant risk. It should be stressed that bariatric surgery is increasingly integral to the management paradigms of many chronic diseases, including diabetes (180 p. 171). Furthermore, in the lifetime management of obesity, treatment should be seen as a continuum as with any chronic disease, and treatment options should be matched to the stage of disease. Initial non-surgical intervention may be appropriate in many individuals who may well benefit from surgery, but have not yet addressed dietary and lifestyle interventions appropriately. Combined therapies including intensive dietary, behavioural, pharmacological, and surgical interventions are being increasingly utilised with enhancement of effect compared to either treatment modality alone.

Appendix D: Types of bariatric surgery, an overview

Bariatric Surgery Operations commonly performed in Australia are described below. These are:

- Sleeve gastrectomy
- *Roux-en Y* Gastric Bypass (RYGB)
- Mini gastric bypass - One Anastomosis Gastric Bypass (MGB - OAGB)
- Adjustable Gastric Banding
- Biliopancreatic Diversion (BPD)
- Biliopancreatic Diversion with Duodenal Switch (BPD-DS) and Single Anastomosis Duodeno–Ileal Bypass with Sleeve Gastrectomy (SADI-S).

Each of these bariatric surgery types are proven to be safe and effective, with good evidence of long-term benefit. This list is not exhaustive and some of the procedures included are continuing to evolve. New procedures may be developed that provide additional options in the future.

All procedures overviewed in this Appendix are routinely performed laparoscopically (via multiple small incisions on the abdomen, using a camera and long instruments inserted into the abdomen). They can also be performed open (done directly via a larger incision) or using a surgical robot.

There is no single 'best' bariatric operation, and all have inherent advantages and disadvantages. Between the types of bariatric surgery operations there are variations in:

- the amount of weight loss expected
- reliability in producing significant weight loss
- durability of weight loss over time
- impact on obesity related diseases
- expected side effects
- risk and type of complications during the operation, and in the short and long term after the operation
- risk of vitamin, mineral and protein malnutrition and their sequelae
- recommended follow-up and nutritional supplements after the operation.

For each individual patient, some operations will be safer and more suitable than others, due to the severity of their obesity related disease, their medical and surgical history, and their lifestyle, goals and values. Services should therefore offer a range of operations that will safely and effectively provide for the majority of their referred patients, and attempt to provide objective, evidence-based advice to allow patients to an informed choice of operation. In the rare event where the most suitable procedure for a patient is not available in one service, the patient may need to be referred to another service.

Weight loss after bariatric surgery is generally most pronounced in the first six months after surgery. Weight loss may then continue for approximately another year. It is normal for a stable weight to be reached a few years after operation and regaining a small portion of the weight lost initially is also normal and expected.

D1. Sleeve Gastrectomy

Sleeve gastrectomy involves removing the outer section of the stomach to form a narrower, more tubular stomach. This reduces the capacity and compliance of the stomach. The resultant stomach still has the advantage of functioning like the original stomach but transmits a signal of satiety at much lower volumes. Patients subsequently consume only a fraction of the food and calories per meal.

Sleeve gastrectomy also leads to weight loss by changing the production of various circulating gut hormones which control hunger and satiety. Patients may also find that their taste for certain foods, particularly sweet and fatty foods, is altered and may prefer healthier choices.

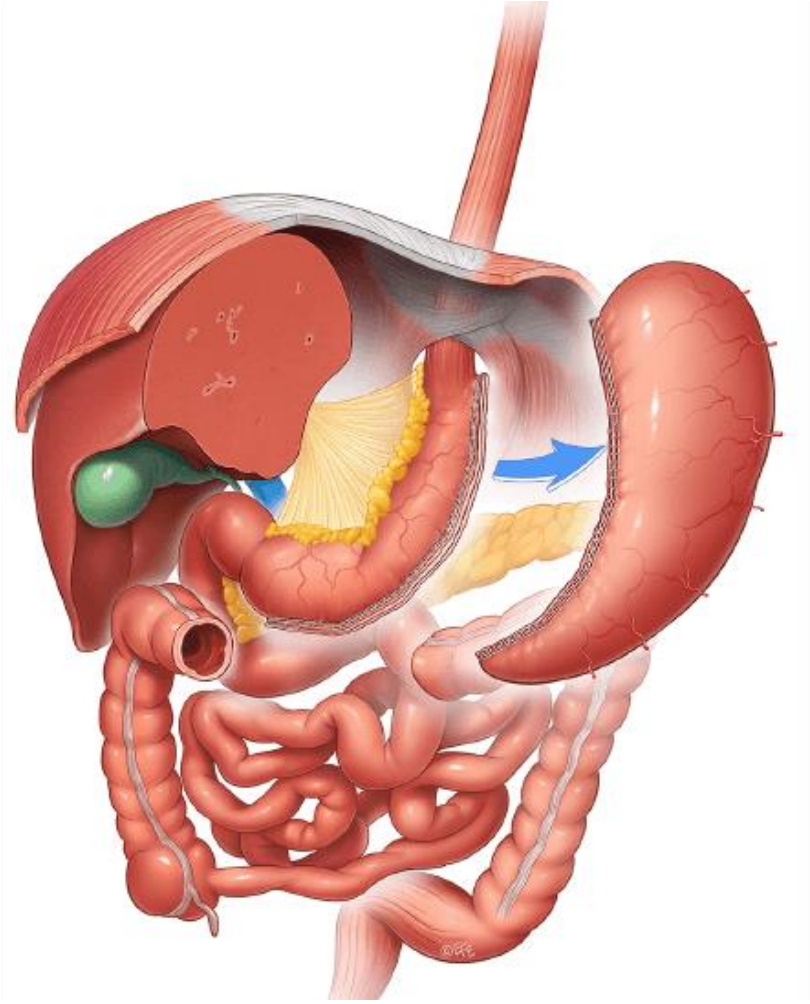
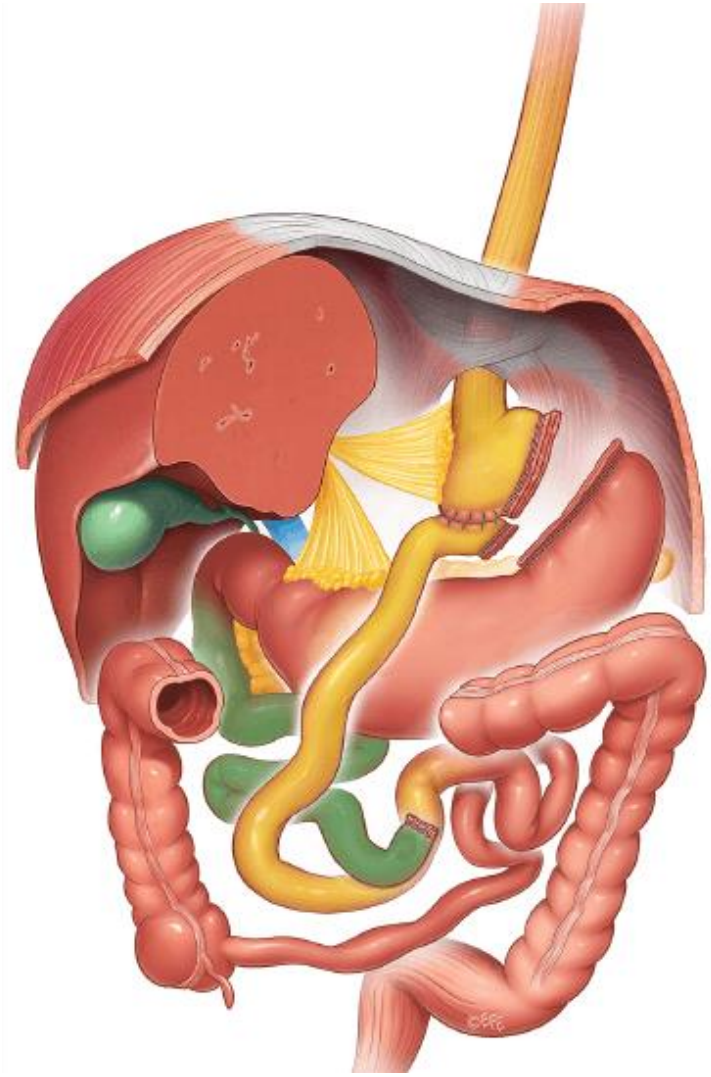


Image source: © Dr Levent Efe, courtesy of IFSO

D2. *Roux en Y* Gastric Bypass (RYGB)

Roux en Y Gastric bypass involves forming a small stomach pouch that is disconnected from the rest of the stomach. A section of the small bowel is then disconnected and joined to this pouch. After a measured length, this small bowel is joined back onto small bowel further along the intestine. This means that food 'bypasses' the remaining stomach, duodenum and start of the small bowel.

Roux en Y Gastric Bypass restricts the amount that can be eaten in one sitting, with the stomach transmitting a signal of satiety early. The 'bypassing' of food into the small bowel has a metabolic (hormonal) weight loss effect. Malabsorption is not a major mechanism of weight loss as previously thought. The effects are due to reduced stomach volume, but also a variety of changes to gut hormones that occur with more rapid transit of food into the small bowel.



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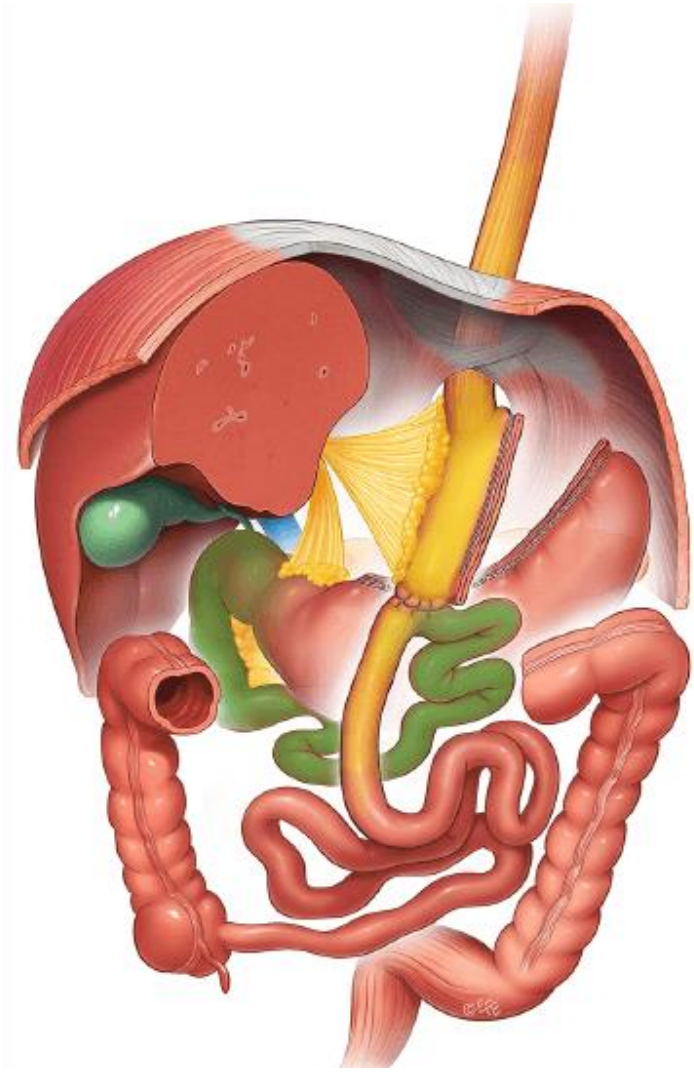
D3. Mini gastric bypass - One Anastomosis Gastric Bypass (MGB - OAGB)

The Mini gastric bypass - One Anastomosis Gastric Bypass reduces the size of the "working" stomach by creating a tubular pouch of stomach that is disconnected from the rest of the stomach. This pouch is then connected to the side of the intestine, a measured distance from its beginning. This technique is different from the *Roux en Y* Gastric Bypass because it only has one join (anastomosis), rather than using 2 joins to separate a new channel for food coming from the stomach.

This Bypass has also been referred to as a 'mini' gastric bypass, a term which should be avoided because it may give the impression that it is in some way less invasive than other operations and cause patients and health care workers to underestimate the magnitude of the effects and risks of the procedure. The label "mini" refers to its introduction as a procedure which was able to be performed through a small open wound ("mini laparotomy").



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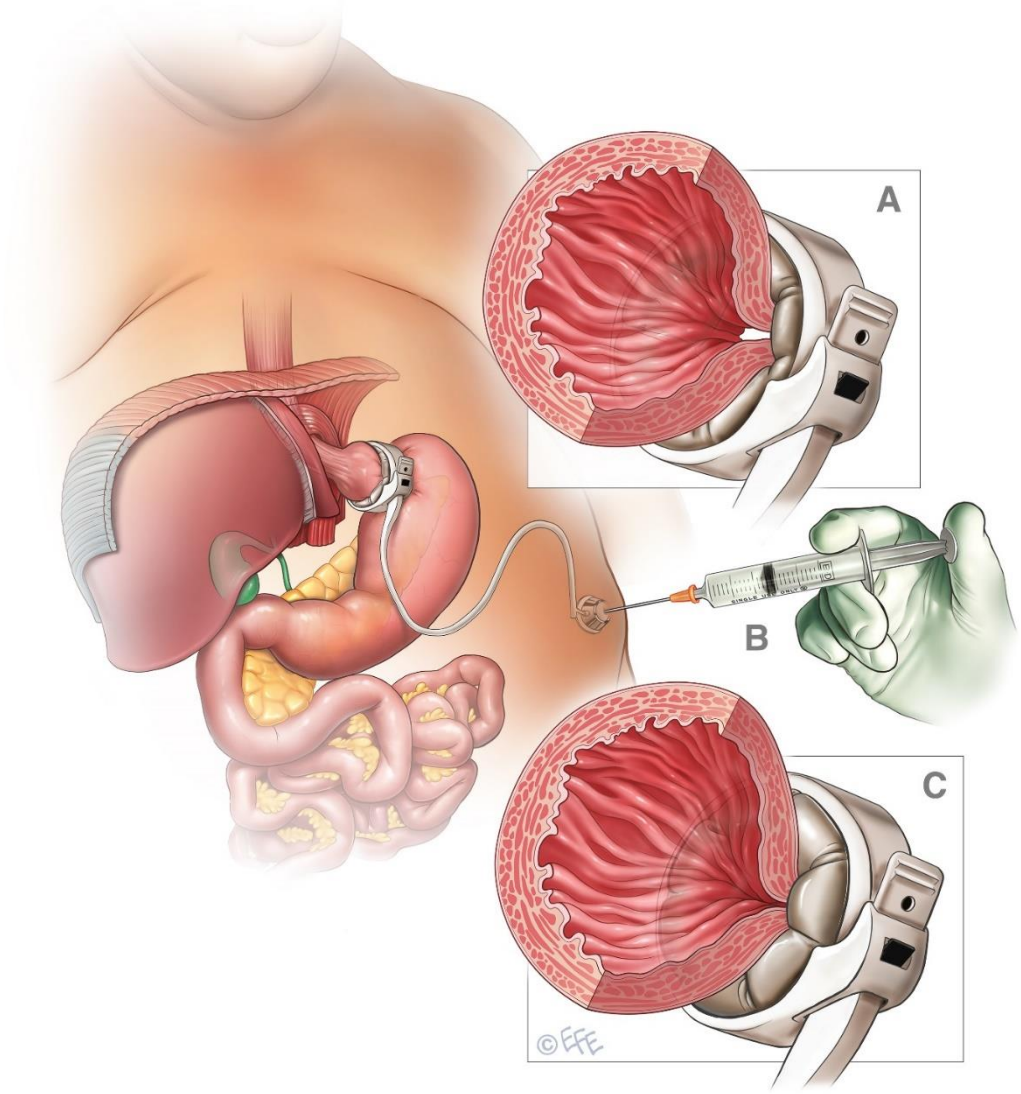
D4. Adjustable Gastric Banding

The adjustable gastric band is a device placed around the upper portion of the stomach to slow food progression and create an enhanced sense of satiety and reduce hunger. It also It has an inflatable portion that allows the band to be tightened or loosened to regulate its effect.



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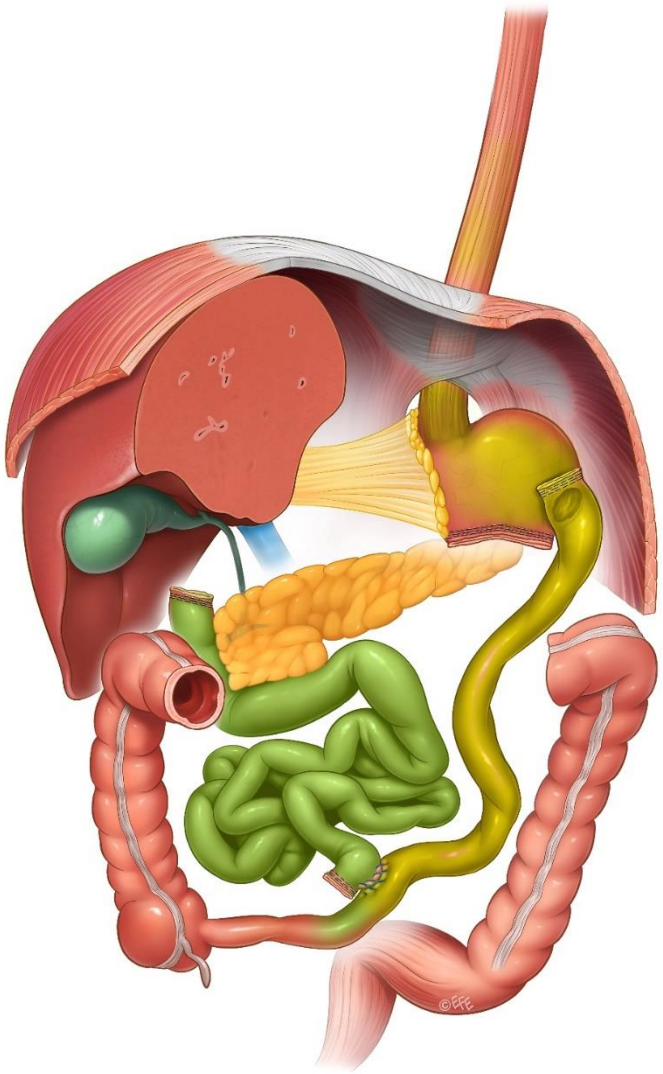
D5. Biliopancreatic Diversion (BPD)

Biliopancreatic diversion involves either removing or disconnecting the lower portion of the stomach, leaving a pouch somewhat larger than those created in gastric bypass operations. This pouch is then connected to the ileum (lower section of small bowel). After this operation, food travels from the remaining stomach to the later portion of the small intestine bypassing a long segment of the small bowel.

This procedure reduces the amount that is eaten in one sitting, as well as having strong metabolic (hormonal) effects on obesity. It also reduces the absorption of some of the nutrients and calories that are eaten.



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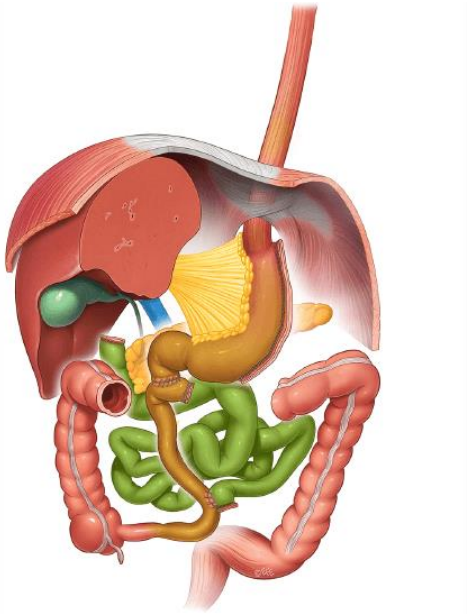
D6. Biliopancreatic Diversion with Duodenal Switch (BPD-DS) and Single Anastomosis Duodeno-Ileal Bypass with Sleeve Gastrectomy (SADI-S)

These are newer variations on the biliopancreatic diversion which are now more commonly performed than the original BPD. Both usually include reduction of stomach size by removing the outer portion of the stomach in a manner similar to the sleeve gastrectomy (see C1).

The Biliopancreatic Diversion with Duodenal Switch (BPD-DS), which may also be referred to as simply a Duodenal Switch (DS) involves dividing the duodenum (very start of the small bowel just beyond the stomach) and then attaching small bowel just outside the stomach. Another connection is made to the later portion of the small bowel similar to that in BPD.



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Appendix E: Bariatric Surgery in Low Acuity Services

The majority of bariatric surgery is low risk, with low rates of complication and very rare instances of patients deteriorating. It is therefore safe and appropriate to perform bariatric surgery in lower acuity centres without on-site critical care facilities (no High Dependency Unit or Intensive Care Unit), provided that:

- Appropriate criteria are used when assessing each patient's risk profile to identify the minority of patients at higher risk of deterioration and who require on-site critical care facilities.
- Patients are cared for by nursing and medical staff trained and experienced in the care of patients recovering from bariatric surgery.
- Standardised recovery pathways are employed that include criteria and protocols for escalation of care.
- Relationships and protocols are in place to ensure the smooth and timely transfer to a centre with critical care facilities in the rare instance that a patient deteriorates.

An example of selection patient criteria for surgery in a low acuity centre, without critical care facilities on site, is provided below. These criteria are included as a guide only and to provide an estimate of the rates of transfer and re-operation a facility can expect. They should be evaluated by individual services and adjusted as required.

Example criteria for selecting patients for bariatric surgery in a low acuity centre

- Body Mass Index (BMI) under 48 males and under 52 for females
- Weight under 160kg
- Moderate, Mild or No Obstructive Sleep Apnoea (OSA), or well treated Severe OSA on Continuous Positive Airway Pressure (CPAP).
- Two or fewer minor comorbidities:
  - Hypertension on medication
  - Ischaemic Heart Disease or Valvular Heart Disease
  - Cerebral Vascular Accident/ Trans-Ischaemic Attack
  - Peripheral Vascular Disease (PVD)
  - Type 2 Diabetes
  - Obstructive Sleep Apnoea (OSA)
  - Moderate respiratory disease
  - Moderate renal impairment
- No major comorbidity predicted to need critical care admission:
  - Chronic pain managed by a chronic pain specialist
  - Unstable diabetes or untreated diabetes (HbA1c 9% or greater)
  - Congestive Cardiac Failure (CCF)
  - Severe respiratory disease
  - Severe, untreated OSA
- No revision procedures other than removal of lap band

Outcomes when applying these criteria

Approximately 80% of patients referred for bariatric surgery at a tertiary public hospital (Austin Health, Melbourne) met these inclusive criteria. The use of these criteria to allow over 300 patients to undergo bariatric surgery (predominately sleeve gastrectomy and gastric bypass) in a low acuity facility was reviewed. Less than 2% of patients required transfer to a high dependency or intensive care unit and less than 1% of patients required a second operation to treat a complication of their surgery.

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