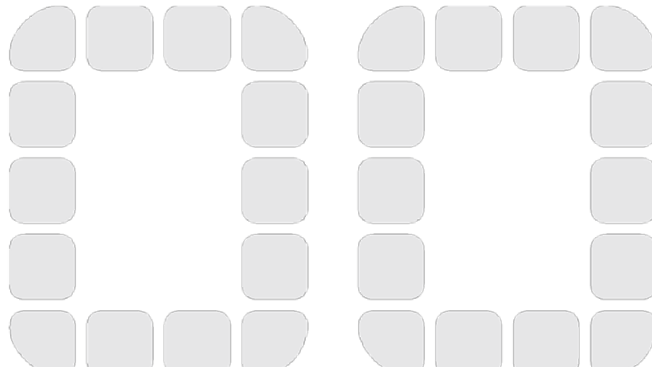




Bariatric Surgery:

An evidence review and summary
of service provision in Western
Australia



October 2014

Acronyms and abbreviations

Acronym	
AGB	Adjustable gastric banding
BMI	Body Mass Index
BPD	Biliopancreatic Diversion
BPD-DS	Biliopancreatic Diversion with Duodenal Switch
FSH	Fiona Stanley Hospital
GBP	Gastric Bypass Procedure
HTA	Health Technology Assessment
JHC	Joondalup Health Campus
LAGB	Laparoscopic Adjustable Gastric Banding
MBS	Medicare Benefits Schedule
MSAC	Medical Services Advisory Committee
NHMRC	National Health and Medical Research Council
NICE	National Institute for Health and Care Excellence
RCT	Randomised Controlled Trial
RYGB	Roux en Y Gastric Banding
SCGH	Sir Charles Gairdner Hospital
SG	Sleeve Gastrectomy
VBG	Vertical Banded Gastroplasty
WA	Western Australia

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Executive Summary

The recent Clinical Senate debate: 'Living Large – a system response to obesity' (November 2013) resulted with a recommendation to identify or commission a cost benefit analysis of bariatric surgery to inform decision making in the State's ongoing role in the provision of bariatric surgery.

This technology brief aims to summarise the most recent published research findings on the efficacy, safety, and cost-effectiveness of bariatric surgery, and discuss these findings with reference to the Western Australian context.

Background

In 2011-2012, around 60% of Australians adults were classified as overweight or obese and, of these, more than 25% were classified as obese. Obesity and morbid obesity are associated with numerous conditions which result in a reduced quality of life and/or life expectancy. These health problems also result in a substantial economic burden, with estimated costs attributed to excess body mass of \$241.0 million (5.4 %) of all acute hospital expenditure in WA in 2011.

Bariatric surgery is an evolving subspecialty of gastrointestinal surgery and is used to induce weight loss in people who have failed to achieve weight loss by other measures. Broadly speaking, bariatric surgery aims to reduce intake by restricting gastric capacity and/or produce malabsorption the small bowel absorptive area. There are several types of bariatric surgery being performed in Australia.

Evidence Review

A brief summary of the most recent and relevant reviews and guidelines is presented:

- Bariatric surgery is considered more effective in achieving weight loss than non-surgical interventions (such as pharmaceutical treatments or calorie controlled diets). The associated weight loss is also maintained over time.
- Bariatric surgery is considered universally cost effective compared with no surgery and is likely to be cost saving to the payer over time.
- Although bariatric surgery is generally considered as having acceptably low morbidity and mortality rates, there are potential serious adverse effects associated with the surgery. Revisions or reversals may be required and complications do occur with this major surgery.
- With regards to type of surgery, there is no consensus as to whether a specific technique should be preferred. Laparoscopic procedures were generally associated with similar efficacy better safety and therefore improved cost effectiveness as compared with open procedures.
- The most complex procedures (such as biliopancreatic diversion) are generally associated with better outcomes but are also associated with the highest likelihood of adverse events. Therefore, the type of surgery is chosen in consultation with the clinician and patient and balances the risks and benefits of each surgery type alongside a range of other variables.

In addition, there are a range of other factors that should be taken into account when considering bariatric surgery, such as:

- Patient selection; factors such as age, BMI, comorbidities and a commitment to following lifestyle interventions to get best results and avoid adverse events after surgery is critical.

- Post-operative care and follow up with regular monitoring is necessary to reduce the rate of adverse events and increase the durability of results.
- The use of a multi-disciplinary team and the caseload and expertise of surgeons; there is a steep learning curve associated with bariatric surgery and experience reduces operative mortality.
- There are wide ranging infrastructure requirements; as a minimum, appropriately sized and weighted equipment and beds/facilities are needed to cater for bariatric patients.

Western Australian Context

A range of detailed documents were identified regarding bariatric surgery that are directly relevant to the Western Australian context, including a Model of Care and the WA Health Bariatric Surgery Plan. As a result of the Bariatric Surgery Plan, Operational Directive 0402/12: 'Plan for access to Surgical Procedures for Obesity for Public Patients' was mandated. As of 26 November 2012, all bariatric cases were transitioned to the state-wide bariatric service at JHC. Complex tertiary level bariatric cases continue to be completed at SCGH. Bunbury Hospital are also contracted to provide services for rural and remote patients in the south west. This operational directive also sets out standardised access criteria for surgical procedures for obesity.

Both staff at JHC, SCGH and WACHS report that the bariatric surgery service provided is good and that it is working well. Refinements have been made to the criteria for surgery and working relationships have become well established to ensure that the service provided is of high quality. No serious adverse events have been reported during the conduct of bariatric surgery at JHC. Good progress has been made in reducing the waiting time for assessment and reducing the wait time for bariatric surgery overall.

Given the satisfaction reported with the waitlist and provision of bariatric surgery at JHC, indications are that demand is currently being met. If, at a future date, bariatric surgery should be offered at additional centres across the state, then consideration will need to be given to the number of cases that will need to be performed at the new sites and across WA as a whole, to ensure that proficiency is maintained. In addition, it will be important to ensure that there is equity and consistency in the quality of the services provided and that there is no inequity of access.

Conclusion

Bariatric surgery appears to be a relatively safe and clinically effective. It is also a cost effective procedure assuming that the surgeons have the sufficient level of expertise required to maintain proficiency. There are a huge number of infrastructure requirements surrounding the surgery with specialised equipment being required.

On the basis of a the WA Bariatric Surgery Plan and the Operational Directive, the current bariatric surgery service in WA appears to be working well, with good efficacy and low adverse event rates and well managed wait list and strict eligibility criteria for surgery.

There appear to be no reasons at present to change the current arrangements for bariatric surgery in WA.

Introduction

The recent Clinical Senate debate: 'Living Large – a system response to obesity' (November 2013) considered the challenges of meeting the needs of the obese patients now and in the future. A number of recommendations resulted from this meeting, including the following with regards to bariatric surgery:

The Department of Health identify or commission a cost benefit analysis of bariatric surgery to inform decision making in the State's ongoing role in the provision of bariatric surgery.

- If the analysis reveals a compelling case to provide bariatric surgery, services should be expanded to include all public hospitals
- If not, the service should cease at public hospitals.
- Include guidelines for matching type of surgery to patient need and criteria for clinical prioritisation.

This technology brief aims to summarise the most recent published research findings on the efficacy, safety, and cost-effectiveness of bariatric surgery, and discuss these findings with reference to the Western Australian context.

Background

Body Mass Index (BMI) is a simple measurement used for identifying obesity. Clinically severe (morbid) obesity is defined as a BMI of equal or greater than 40 kg/m² or a BMI over 35 kg/m² where there are other obesity-related comorbidities. In 2011-2012, around 60% of Australians adults were classified as overweight or obese and, of these, more than 25% were classified as obese. In 2007, around 17% of children aged 2-16 were overweight and 6% were classified as obese (National Health and Medical research Council, 2013).

Obesity and morbid obesity are associated with numerous conditions such as type 2 diabetes, cardiovascular disease and some cancers. Obesity is also associated with a wider range of conditions such as osteoarthritis, reproductive and mental health problems. These conditions predict a higher mortality and/or morbidity, thus a reduced quality of life and/or life expectancy.

These health problems also result in a substantial economic burden. The cost of excess body mass to the acute hospital system in Western Australia 2011 (published in June 2013) was analysed. Excess body mass was defined as the body mass above which the risk of disease from the attributable harms are increased. This cost of illness study calculated that 6.7% of all inpatient separations and 1% of all emergency presentations in 2011 were attributed to excess body mass. Total acute hospital costs attributed to excess body mass were \$241.0 million or 5.4 % of all acute hospital expenditure. Projections from this study for the year 2021 predict costs of \$488.4 million (in constant price dollars) representing a 102.6% increase in costs compared to 2011.

The key lifestyle areas affecting overweight and obesity are nutrition, physical activity and behavioural change. Intensive interventions to support weight loss, considered as an adjunct to lifestyle approaches, include very low-energy diets, weight loss medication and bariatric surgery. Bariatric surgery is an evolving subspecialty of gastrointestinal surgery and is used to induce weight loss in people who have failed to achieve weight loss by other measures. Broadly speaking, bariatric surgery

aims to reduce intake by restricting gastric capacity and/or produce malabsorption the small bowel absorptive area.

There are several types of bariatric surgery currently being performed in Australia:

- Laparoscopic adjustable gastric banding (LAGB): a small silicone band is placed around the top of the stomach to produce a small pouch, about the size of a thumb, thereby limiting food intake. The band can be tightened or loosened.
- Sleeve gastrectomy (SG): the greater portion of the fundus and body of the stomach are removed with a stapling device. This results in a stomach tube instead of a stomach sack with a fixed volume reduction to about 200mL.
- Roux en Y gastric bypass (RYGB): a combination procedure wherein a small stomach pouch is created to restrict food intake. A Y-shaped section of the small intestine is then attached to allow food to bypass the lower stomach, duodenum and proximal jejunum to produce malabsorption and thereby reduce kilojoule intake.
- Biliopancreatic diversion (BPD): a combination procedure wherein the lower stomach is removed and a duodenal and jejunal bypass is created to induce significant malabsorption. This is usually performed in speciality centres.
- Vertical banded gastroplasty (VBG) also known as stomach stapling: the stomach near the oesophagus is stapled vertically to create pouch. The outlet from the pouch to the rest of the stomach is restricted by a band. This technique is no longer considered standard practice in Australia (NHMRC, 2013).

Evidence Review – Australian Publications

A search for publications related to bariatric surgery revealed that a number of guidelines and reviews have been recently conducted that are relevant to the Australian context. Therefore a *de novo* systematic review or cost effectiveness analysis is not deemed necessary. A brief summary of the most recent and relevant reviews and guidelines is presented.

National Health and Medical Research Council (NHMRC, 2013)

In 2013, the NHMRC published updated '*Clinical Practice Guidelines for the management of overweight and obesity in adults, adolescents and children in Australia*'. The Guidelines provide detailed, evidence-based, recommendations for assessing and managing overweight and obesity in adults, adolescents and children. This review was funded by the Department of Health and Ageing.

Effectiveness

This review stated that bariatric surgery is more effective in achieving weight loss in adults with obesity than non-surgical weight loss interventions. The studies demonstrated weight loss of up to 30% of body weight in people with a BMI > 35 kg/m² undergoing bariatric surgery. Across all of the studies included in the review, weight loss with bariatric surgery (as opposed to any other intensive intervention) was most likely to be maintained after 5 years.

Bariatric surgery was found to be associated with significant short term improvements in some cardiovascular and metabolic risk factors; such as reduced hypertension and improved lipid profiles. The majority of these health benefits were found to be maintained in the longer term (10 year follow up). The following health benefits were also observed with bariatric surgery: improved indicators of abnormal renal function in adults with chronic kidney disease; improved symptoms of gastro-oesophageal reflux disease; improved markers of liver function and inflammation from non-alcoholic steatohepatitis. In addition, there were lower rates of mortality among people who have had bariatric surgery compared with those who have not.

There is also a growing body of evidence suggesting that bariatric surgery leads to improved glycaemic control and medication use and resolution of type 2 diabetes in people with newly diagnosed (less than 2 years) type 2 diabetes. However, given there remains some uncertainty surrounding the mechanism of this effect, the longevity of effect and strength of the effect in people with lower BMI ranges and also whether this effect is across all types of bariatric surgery.

With regards to the cost effectiveness of bariatric surgery, the review stated that numerous studies have reported that bariatric surgery is a cost-effective weight loss intervention compared with nonsurgical treatment of obesity, although the variability in estimates of costs and outcomes is large. In people with newly diagnosed type 2 diabetes, bariatric surgery has been shown to be a cost-effective option.

Adverse events

The review highlighted that while bariatric surgery can achieve long-term weight loss; the surgery is not always successful and may require revision or reversal of bariatric procedure depending on the type of surgery. Complications do affect a significant proportion of people who have bariatric surgery, with estimates from studies of major complications of 4.1%, operative re-intervention rates of 13% and operative death as 0.25%. Typically complications occur in the short term while the individual is

still in the care of the bariatric surgeon, however there are longer term complications and long term follow up, such as nutritional status, is required. Achieving long-term weight loss requires weight management strategies to be continued after bariatric surgery has been performed. Also, resolution of comorbidities may not be sustained in the longer term and continuing monitoring of these is required.

Additional considerations

The review did however highlight the need for caution in interpreting the results from the studies and stated that outcomes from the general medical community may not be equal to those of surgical 'centres of excellence'. In addition, the review highlighted the critical role of the multidisciplinary team in undertaking bariatric surgery. It stated that there is consensus in the literature that better outcomes are achieved when a multidisciplinary team (e.g. including bariatric physician, bariatric nurse, dietitian, exercise physiologist and psychologist) is involved.

Recommendations by NHMRC

The resulting guidelines and criteria for conducting bariatric surgery from this review are as follows:

- BMI >40 or BMI >35 with comorbidities that may improve with weight loss
- Bariatric surgery may be a consideration for people with BMI>30 with poorly controlled type 2 diabetes and increased cardiovascular risk
- Bariatric surgery should be part of an overall clinical pathway delivered by a multidisciplinary team including surgeons, dietitians, nurses, psychologists, physicians with follow-up.

The choice of surgical technique is individualised and involves discussion between the surgeon and the person. The choice of procedure takes into account factors such as age, access to services for follow up and monitoring, preparedness to commit to frequent follow-up and continuing lifestyle interventions, previous interventions, and risk profile.

Medical Services Advisory Committee (2011)

In 2011, the Medical Services Advisory Committee evaluated the current evidence and clinical best practice relating to Medicare Benefits Schedule (MBS) items for the surgical interventions for the treatment of obesity. The evaluation included a comprehensive review of the safety and efficacy of the individual bariatric procedures performed in Australia.

Effectiveness

The report states that bariatric surgery for clinically severe obesity is universally reported to be more effective in inducing long-term, sustainable weight loss than non-surgical methods. Three year data shows that the extent of BMI loss, for each procedure is between 25% and 35%. Weight loss was found to be correlated with improvement in metabolic diseases such as type 2 diabetes and has a positive impact on quality of life.

With regards to the type of bariatric surgery, biliopancreatic diversion (BPD) and biliopancreatic diversion with duodenal switch (BPD-DS) was found to be the most effective procedure of those compared in inducing long-term weight loss and comorbidity resolution, particularly in 'super-obese' patients. Many studies found laparoscopic adjustable gastric banding (LAGB) to be less effective than most other procedures. There are few relatively long-term study data and quality of life post-surgery

studies available for newer surgical techniques such as sleeve gastrectomy (SG). However, the evidence that is available suggests that laparoscopic SG has been shown to reduce weight, comorbidities, and operative risk and can be considered as an effective stand-alone restrictive procedure for weight loss.

Laparoscopic procedures were generally associated with similar efficacy as open procedures. There were limited outcome data for subgroups of the morbidly obese, including adolescents and patients with particular comorbidities.

The economic review in the report noted that there was a lack of well-performed Australian studies and cost-utility analyses. However, the studies that were identified suggested that bariatric surgery for obesity is universally reported to be cost effective compared with no surgery. Many of the studies show bariatric surgery to be cost saving to the health care payer after several years, although caution was recommended in considering the scope of these studies. Generally, LAGB was most cost effective technique; however caution is required in interpreting results across studies as differences may be driven by the underlying data and study designs.

The review also concluded that the published literature suggests that bariatric surgery appears to be more cost effective in women and younger people (due to greater life expectancy over which benefits accrue), and people with higher BMIs and comorbidities such as diabetes (in whom surgery makes the greatest clinical difference). Surgery is also more cost effective in people with newly diagnosed diabetes compared with established diabetes (at least two years since diagnosis).

Adverse events

The review found that bariatric surgery is generally considered to have acceptably low morbidity and mortality rates. However, bariatric surgery is associated with complications that may affect the patient's quality of life, and bariatric procedures are not uniformly low risk. Generally, potential for postoperative complications is related to surgical complexity, which is correlated with the effectiveness of the procedure. For example, LAGB is associated with lower initial operative mortality and morbidity than other surgical procedures for obesity and may therefore be preferred for people who want a safer operation with potentially lower weight loss. However, there is some concern about reoperation/revision rates despite its greater safety, faster recovery period. Biliopancreatic diversion (BPD) and biliopancreatic diversion with duodenal switch are technically demanding procedures, associated with the highest morbidity and mortality rates of all bariatric surgery techniques. The high mortality, coupled with higher incidence of long-term nutritional and vitamin deficiencies, stomal ulceration, severe protein-energy malnutrition, and dumping has resulted in limited widespread acceptance of BPD.

Laparoscopic approaches to each of the bariatric procedure have been demonstrated to achieve improved safety compared with open techniques of the same procedure. This is because laparoscopic procedures result in the same gastrointestinal transformation as open procedures but minimise the problems related to open surgery such as wound infection, incisional hernia and general anaesthetic risk related to laparotomy. Laparoscopic procedures may not, however, be possible for all patients (e.g. the super obese, or patients who have had multiple abdominal surgeries).

Additional considerations

The review highlighted that large weight loss with surgery also depends on ongoing dietary/lifestyle interventions as surgical therapy is usually combined with dietary therapy and/or a behaviour counselling/lifestyle modification program. In addition, the review concluded that, ideally, bariatric surgery should be performed by a surgeon who has substantial experience, performs bariatric surgeries frequently (50–100 cases per year), operating in properly equipped, high volume weight loss centres (>100 cases per year) with integrated and multidisciplinary treatment, as there is a steep learning curve associated with bariatric surgery and experience reduces operative mortality.

Recommendations by MSAC

The review summarised that all of the current bariatric surgical procedures in Australia were found to be safe and cost effective compared with non-surgical interventions at inducing weight loss. Some procedures were found to be safer than others (for example LAGB) and some procedures were more clinically effective than others (for example gastric bypass). From an economic viewpoint, LRYGB should potentially be used over open bypass unless laparoscopic procedures are contra-indicated in the patient or conversion is required during surgery. However, the review does not recommend restricting MBS items because different procedures will better suit different patients depending on their clinical condition.

MSAC agreed that, compared to other interventions, surgery is more effective in the longer term than non-surgical treatment of obesity and is associated with more acceptable levels of morbidity and mortality in correctly selected patients and in the hands of experienced surgeons.

Evidence Review – International Publications

National Institute for Health and Care Excellence (NICE), UK

The National Institute for Health and Care Excellence (NICE) in the UK have issued a number of pieces of guidance related to bariatric surgery and the management of obesity. These include NICE Clinical Guideline 43 on Obesity (published in 2006); this is currently being reviewed with an update due to be published in November 2014.

A review of the clinical and cost effectiveness of bariatric surgery for obesity: a systematic review and economic evaluation (2009) conducted by the Southampton Health Technology Assessment (HTA) Centre on behalf of NICE was also identified.

Effectiveness

The review conducted by the Southampton HTA Centre found that bariatric surgery was a more effective intervention for weight loss than non-surgical options. In one large Swedish cohort study weight loss was still apparent 10 years after surgery, whereas patients receiving conventional treatment had gained weight; the review notes that although there were significant baseline differences between treatment groups that these were controlled for during analysis.

After surgery statistically fewer people had metabolic syndrome and there was higher remission of Type 2 diabetes than in non-surgical groups. In one large cohort study the incidence of three out of six comorbidities assessed 10 years after surgery was significantly reduced compared with conventional therapy.

With regards to the type of bariatric surgery, a total of 20 randomised controlled trials (RCTs) were identified that compared types of surgical intervention. The review qualitatively summarised the studies and stated that gastric bypass (GBP) was more effective for weight loss than vertical banded gastroplasty (VBG) and adjustable gastric banding (AGB). All comparisons of open versus laparoscopic surgeries found similar weight losses in each group. Comorbidities after surgery improved in all groups, but with no significant differences between different surgical interventions.

Bariatric surgery was found to be cost-effective in comparison to non-surgical treatment in the reviewed published estimates of cost-effectiveness. However, these estimates are likely to be unreliable and not generalisable because of methodological shortcomings and the modelling assumptions made. Therefore a new economic model was developed which found that although bariatric surgery was more costly than non-surgical management of obesity, the outcomes were improved. All estimates of cost effectiveness were within the range regarded as cost-effective from an NHS decision-making perspective.

The review stated that adverse event reporting varied; mortality ranged from none to 10%. Adverse events from conventional therapy included intolerance to medication, acute cholecystitis and gastrointestinal problems. Major adverse events following surgery, some necessitating reoperation, included anastomosis leakage, pneumonia, pulmonary embolism, band slippage and band erosion.

Additional considerations

The review highlighted a number of areas for further research, including the fact that uncertainties remain regarding the following factors: patient quality of life; impact of surgeon experience on

outcome; late complications leading to reoperation; duration of comorbidity remission and resource use.

Recommendations by NICE

Clinical Guideline 43 recommending bariatric surgery as a treatment option for people with obesity if all of the following criteria are fulfilled:

- they have a BMI of 40 kg/m² or more, or between 35 kg/m² and 40 kg/m² and other significant disease (for example, type 2 diabetes or high blood pressure) that could be improved if they lost weight
- all appropriate non-surgical measures have been tried but have failed to achieve or maintain adequate, clinically beneficial weight loss for at least 6 months
- the person has been receiving or will receive intensive management in a specialist obesity service
- the person is generally fit for anaesthesia and surgery
- the person commits to the need for long-term follow-up.

The type of surgical intervention is chosen after taking the following into account:

- the degree of obesity
- comorbidities
- the best available evidence on effectiveness and long-term effects
- the facilities and equipment available
- the experience of the surgeon who would perform the operation.

Additional factors

As alluded to within the evidence review section, there are a number of additional factors that impact on the clinical and cost effectiveness of bariatric surgery. Most importantly these include patient selection, pre and post-operative care, the use of a multi-disciplinary team and sufficient caseload to ensure surgeon expertise in the techniques.

There are also infrastructure requirements that must be considered in the implementation of bariatric surgery. Firstly there are minimum equipment requirements that include (but are not limited to) the following: appropriately sized chairs; imaging equipment; appropriately weighted beds and examination couches; scales going above 150 kg; toilets that are not wall suspended; operating tables which are wide enough and appropriately weighted; longer surgical instruments; specialised bariatric anaesthetic equipment and equipment for patient transfers. It is also important to consider the credentialing requirements of the operating surgeons, ongoing audit of outcomes, peer review and supervision with mechanisms for quality and outcome monitoring.

The NHMRC report also outlined that services for bariatric surgery and necessary follow-up may be more limited in rural and remote areas. The additional cost and resource implications to the individual

and the health system include frequent follow-up and monitoring, transport issues in both urban and rural areas, and accessibility to services and providers. The sustained lifestyle changes and additional intensive interventions that may be required to ensure the effectiveness of surgery should also be factored in to individual and health system costs. Subsequent surgical procedures (for weight loss, complications or cosmetic procedures) should also be considered as a significant cost implication to the individual and health system.

The Western Australian Context

The following documents identified regarding bariatric surgery are directly relevant to the Western Australian context:

- [Morbid Obesity Model of Care](#) (May 2008)
- [WA Health Bariatric Surgery Plan – a standardised approach to surgery for obesity](#) (July 2012)
- [Plan for access to Surgical Procedures for Obesity for Public Patients](#) (OD 0402/12, November 2012)

The 'WA Health Bariatric Surgery Plan – a standardised approach to surgery for obesity' was informed by a review conducted by Professor Kingsley Faulkner, who was appointed on behalf of the Director General. Professor Faulkner undertook an independent review of bariatric services and formulated recommendations for WA Health. The resulting Bariatric Surgery Plan provides an overview of obesity in the context of elective surgery and identifies issues and proposed strategies to improve the care co-ordination and management of these patients. The Bariatric Surgery Plan recommends that an operational directive for elective bariatric surgery be developed consistent with the approaches taken in England and New South Wales. In particular, it recommends the following:

- standardised access criteria for bariatric surgery and establish this as a state-wide policy for all public hospitals providing bariatric surgical intervention.
- state-wide policy that all uncomplicated elective bariatric procedures are classified as category 3.
- Joondalup Health Campus (JHC) should become the statewide provider for bariatric surgery. Cases requiring tertiary level care will be referred to Sir Charles Gairdner Hospital (SCGH).

As a result of the report by Professor Faulkner and the Bariatric Surgery Plan, Operational Directive 0402/12: 'Plan for access to Surgical Procedures for Obesity for Public Patients' was mandated. As of 26 November 2012, all bariatric cases were transitioned to the state-wide bariatric service at JHC. Complex tertiary level bariatric cases continue to be completed at SCGH. Bunbury Hospital are also contracted to provide services for rural and remote patients in the south west. This operational directive also sets out standardised access criteria for surgical procedures for obesity.

Current service provision in WA

In accordance with Operational Directive 0402/12, JHC currently provides laparoscopic gastric bands and laparoscopic gastric sleeves. A multidisciplinary team approach is adopted and the team is currently comprised of three surgeons, bariatric GPs, clinical psychologists and the dietetics and anaesthetic departments of JHC. Before having surgery, all patients have to undergo a 12 month supervised weight loss program; those able to adhere to this 12 month weight loss program and have achieved significant weight loss will likely be able to comply with the post-operative requirements. Other key criteria for surgery include being aged between 16 and 55 and with a BMI > 40, or a BMI > 35 with associated obesity illnesses (such as type 2 diabetes with sleep apnoea).

WA Health initially agreed to fund 300 separations of bariatric surgery in 2013. The contract for primary bariatric services will include 280 separations at JHC and 20 cases allocated to Bunbury

Hospital (6.75%) to service that catchment area. This would result in consistent ratio (population 2,352,215 divided by 300 separations) across WA of 1:7841.

Table 1 below shows the most recent data on public and private hospital inpatient separations for obesity cases with bariatric surgery recorded in any procedural field. From the data, it is demonstrated that around 10% of the total cases were conducted in the public system.

Table 1

Hospital	2007	2008	2009	2010	2011	2012	2013
Private	1,602	2,091	2,354	2,121	2,223	2,456	2,720
Public	176	231	208	304	419	221	267
Total	1,778	2,322	2,562	2,425	2,642	2,677	2,987

Table 2 below provides a breakdown of the public hospitals inpatient separations for bariatric surgery. In accordance with the operational directive, the majority of bariatric surgery has been conducted as JHC in recent years, with a more limited caseload at SCGH and Bunbury Hospital.

Table 2

Hospital	2007	2008	2009	2010	2011	2012	2013
Bunbury	75	64	27	8	15	17	12
Fremantle	7	6	<5	<5	<5	.	<5
Joondalup HC (public only)	57	124	143	257	359	150	202
Osborne Park	<5	10	.	<5	.	<5	<5
PMH	.	.	<5	<5	<5	<5	<5
SCGH	34	27	35	34	40	49	46
Total	176	231	208	304	419	221	267

Recent waitlist analysis suggests that JHC have 216 procedures for obesity on its elective surgery waitlist. SCGH has 138 procedures for obesity and Bunbury have 26 procedures for obesity on their elective surgery waitlists respectively. All patients referred from SCGH in 2008-2010 and transferred to JHC have been processed and no patient referred to SCGH before 2011 and subsequently transferred to JHC is currently awaiting assessment. Patients referred to SCGH in early 2013 are currently commencing the assessment process. The reasons for transferring care to SCGH include patients requiring tertiary care, patients being prisoners, and the patients weighing over 180kg at the time of surgery.

Both staff at JHC, SCGH and WACHS report that the bariatric surgery service provided is good and that it is working well. Refinements have been made to the criteria for surgery and working relationships have become well established to ensure that the service provided is of high quality. No serious adverse events have been reported during the conduct of bariatric surgery at JHC. Good progress has been made in reducing the waiting time for assessment and reducing the wait time for bariatric surgery overall.

Although there is currently no reported issue in terms of access to and provision of an appropriate bariatric surgery service in WA, one potential issue has been identified with regards to the referral

system and waitlist management. A centralised system needs to be fully developed to ensure that there is no inequity of access for assessment and the subsequent surgery.

Future service provision in WA

Given the satisfaction reported with the waitlist and provision of bariatric surgery at JHC, indications are that demand is currently being met. Wider publication of the current Operational Directive may be warranted to ensure that it is fully disseminated through the system.

As detailed in the earlier sections of this report, careful consideration needs to be given to the supporting infrastructure requirements for such surgery. Such requirements include, but are not limited to, access to multi-disciplinary teams and the wide range of appropriate equipment. Based on these requirements, it makes sense to continue the current service arrangements with the majority of procedures contracted to JHC.

If, at a future date, bariatric surgery should be offered at additional centres across the state, then consideration will need to be given to the number of cases that will need to be performed at the new sites and across WA as a whole. As previously highlighted, it is critical that there is a high volume caseload at operating centres and that individual surgeons have a high enough caseload to maintain proficiency. Increasing the number of sites and thereby reducing the number of operations per site could reduce the effectiveness and thus cost effectiveness of the procedure as a whole. In addition, it will be important to ensure that there is equity and consistency in the quality of the services provided and that there is no inequity of access.

Conclusion

Bariatric surgery appears to be a relatively safe and clinically effective. It is also a cost effective procedure assuming that the surgeons have the sufficient level of expertise required to maintain proficiency. There are a huge number of infrastructure requirements surrounding the surgery with specialised equipment being required.

On the basis of a detailed review and WA Bariatric Surgery Plan developed in 2012, JHC has been contracted by WA Health to conduct 280 cases per year, with 20 cases conducted at Bunbury hospital to service the south west region. Complex tertiary cases are still referred to SCGH. This service appears to be working well, with good efficacy and low adverse event rates and well managed wait list and strict eligibility criteria for surgery.

In conclusion, there appear to be no reasons at present to change the current arrangements for bariatric surgery in WA.