



Guideline

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Statewide Anaesthesia and Perioperative Care Clinical Network (SWAPNet)

Anaesthesia: Non-bariatric Surgery in Obese Patients

1. Statement

Non-bariatric surgery on the obese patient carries with it complexities and risks. Surgeons and anaesthetists need to be aware of these risks and consider the location of the procedure and postoperative care to achieve the best outcomes for patients.

2. Purpose

This guideline provides recommendations to support best practice for the management of obese patients presenting to Queensland Health Level 3 facilities for elective surgery and is specifically designed to enhance safety for patients and staff.

3. Scope

This guideline applies to all Queensland Health employees (permanent, temporary and casual), its agents (including Visiting Medical Officers and other partners, contractors, and consultants) involved in performing elective procedures in operating theatres.

4. Related documents

- Obesity background information (attachment 1)
- Queensland Health Clinical Services Capability Framework Surgical Complexity Criteria (attachment 2)
- ASA Physical Status Classification System (attachment 3)
- Queensland Health Clinical Services Capability Framework
- Queensland Maternity and Neonatal Clinical Guideline – Obesity
- World Health Organisation (WHO) classification of obesity
- Australian Institute of Health and Welfare, Obesity
- Australian Bureau of Statistics, obesity
- Monash Obesity and Diabetes Institute, obesity in Australia
- National Institute of Health, Clinical Guidelines on the Identification, Evaluation and Treatment of Overweight and Obesity in Adults
- Miller's Anaesthesia, sixth edition, R.D.Miller
- International Anaesthesia Research Society, Morbid Obesity and Tracheal Intubation
- British Journal of Medical Practitioners, Anaesthetic management of obese parturient
- American Society of Anaesthesiologists, Predictors of Difficult Intubation in Patients with Morbid Obesity Undergoing Bariatric Surgery

Document details

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Author: Statewide Anaesthesia and Perioperative Care Clinical Network
Endorsed by: Statewide Anaesthesia and Perioperative Care Clinical Network Steering Committee and Statewide Surgical Advisory Committee
Contact: SWAPNET@health.qld.gov.au

Disclaimer:

These guidelines have been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach. Information in this guideline is current at time of publication.

Queensland Health does not accept liability to any person for loss or damage incurred as a result of reliance upon the material contained in this guideline.

Clinical material offered in this guideline does not replace or remove clinical judgement or the professional care and duty necessary for each specific patient case.

Clinical care carried out in accordance with this guideline should be provided within the context of locally available resources and expertise.

This Guideline does not address all elements of standard practice and assumes that individual clinicians are responsible to:

- Discuss care with consumers in an environment that is culturally appropriate and which enables respectful confidential discussion. This includes the use of interpreter services where necessary
- Advise consumers of their choice and ensure informed consent is obtained
- Provide care within scope of practice, meet all legislative requirements and maintain standards of professional conduct
- Apply standard precautions and additional precautions as necessary, when delivering care.
- Document all care in accordance with mandatory and local requirements.

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For further information contact the Statewide Anaesthesia and Perioperative Care Clinical Network (SWAPNET), PO Box 128, RBWH Post Office, Herston Qld 4029, email SWAPNET@health.qld.gov.au, phone (07) 3328 9164. For permissions beyond the scope of this licence contact: Intellectual Property Officer, Queensland Health, GPO Box 48, Brisbane Qld 4001, email ip_officer@health.qld.gov.au, phone (07) 3234 1479.

5. Guideline for Anaesthesia: Non-bariatric Surgery in Obese Patients

5.1 BMI Classification

Body Mass Index (BMI) is a simple index of weight for height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in metres (kg/m²). For example, an adult who weighs 70kg and whose height is 1.75m will have a BMI of 22.9 (BMI = 70 kg / (1.75 m²) = 70 / 3.06 = 22.9).

The World Health Organisation (WHO) international classification of adult underweight, overweight and obesity according to BMI is as follows:

Classification	BMI(kg/m ²)	
	Principal cut-off points	Additional cut-off points
Underweight	<18.50	<18.50
Severe thinness	<16.00	<16.00
Moderate thinness	16.00 - 16.99	16.00 - 16.99
Mild thinness	17.00 - 18.49	17.00 - 18.49
Normal range	18.50 - 24.99	18.50 - 22.99
		23.00 - 24.99
Overweight	≥25.00	≥25.00
Pre-obese	25.00 - 29.99	25.00 - 27.49
		27.50 - 29.99
Obese	≥30.00	≥30.00
Obese class I	30.00 - 34.99	30.00 - 32.49
		32.50 - 34.99
Obese class II	35.00 - 39.99	35.00 - 37.49
		37.50 - 39.99
Obese class III	≥40.00	≥40.00

5.2 Physical Status Classification

The American Society of Anaesthesiologists (ASA) physical status classification categorises obese patients as ASA II (obesity BMI >30 <40) and ASA III (morbidly obese with a BMI >40).

It is acknowledged that a waist-height index has a more direct relationship with morbidity however currently Body Mass Index (BMI) is more commonly measured.

Fat distribution is also an important consideration in assessing overweight or obesity and the associated risk of disease. For example, increased abdominal obesity has been consistently shown to be related to a higher risk of cardiovascular disease, type 2 diabetes and cancer. Central (abdominal) obesity is measured using waist circumference.

5.3 Guidelines for anaesthesia for elective surgery

The following information has been developed to provide assistance for consideration of requirements for safe anaesthetic practice in this population group presenting for elective surgery.

CSCF Level 3 and below facilities (GP anaesthetists, high dependency unit and Bi-level positive airway pressure (BiPAP) available) are able to provide treatment to patients under the following criteria:

BMI	Surgical Complexity	ASA Classification
<30	SC IV	ASA II - III
<35	SC III	ASA II - III
>36 <40	SC III	ASA II
>40	SC II	

* Criteria detailed in attachments 2 and 3

Patients that fall outside the above criteria should be discussed between the surgical and anaesthetic teams and consideration be given to transferring them to the closest hospital with an appropriate CSCF level for the patient BMI.

Informed consent for procedures should include a risk discussion of complications of obesity.

CSCF Level 4 and 5 (specialist anaesthetists, subspecialty surgeons, access to intensive care unit, access to coronary care unit and BiPAP available) are able to provide treatment to patients under the following criteria:

BMI	Surgical Complexity	ASA Classification
<40	SC IV	ASA II - IV
40 - 60	SC III	ASA III - IV
>60	SC II	ASA III - IV

* Criteria detailed in attachments 2 and 3

Patients that fall outside the above criteria should be discussed between the surgical and anaesthetic teams and consideration be given to transferring them to the closest hospital with an appropriate CSCF level for the patient BMI if the facility does not have the necessary resources to manage them effectively or if complications are predictable.

If a decision is made by the multidisciplinary team and the patient to proceed with the anaesthesia and procedure, informed consent should include a comprehensive discussion with the patient about the risks and complications associated with obesity and acknowledgment in writing from the patient that they fully understand the risks and complications.

6. Emergency Surgery

Obese patients that fall outside the elective CSCF criteria will present for emergency surgery. If a patient cannot be transferred due to urgency or logistics (eg. no bariatric ambulance or flight available) effective communication between medical, surgical, nursing and allied health staff is required.

7. Recommended requirements

7.1 Preoperative

7.1.1 Patient

Usual work up plus	Neck circumference greater than 50cm and mallampati 3, indicative of difficult airway, preparation for an awake fibre optic intubation, second anaesthetist and adjuncts such as video laryngoscopy available.
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Cardiovascular Disease	Hypertension (poorly controlled) ischaemic heart disease, congestive heart failure. Consider preoperative echocardiogram for ventricular function and assessment of right ventricular systolic pressure, and / or functional assessment of the heart via dobutamine stress echocardiography or myocardial perfusion scan
Pulmonary	Asthma, obstructive sleep apnoea, consider preoperative arterial blood gas if BMI > 50, polycythemia implies sustained hypoxemia.
Gastrointestinal	Reflux (88% of obese patients have a gastric pH of < 2.5 and 85% have a gastric volume > 25ml), diabetic control

7.1.2 Equipment

- Table and transfer devices appropriate for weight (eg arm boards to expand table)
- “Hover” mattress slide sheets
- Arterial line for blood pressure monitoring, and use of ultrasound for IV and regional placement
- In anticipation of obstructed airway, “ramping” equipment, difficult airway trolley in the room
- Early de-saturation, 10l/min nasal prong oxygen supplementation or pressure support ventilation with tight mask to provide CPAP pre-oxygenation, or high flow nasal oxygenation equipment (ie. Optiflow Thrive)
- Deep vein thrombosis protection devices.

7.1.3 Staffing

- Extra personnel for transfers, positioning and retraction as required.

7.2 Intraoperative

- Anticipation of early de-saturation/reflux as above, ramping and 10l/min nasal prong oxygen supplementation or use of high flow nasal oxygenation (ie. Optiflow Thrive)
- Patient protection – padding, beware of constricting clothing
- Prevention of temperature loss
- DVT prophylaxis
- Discussion with surgeon
- Regional techniques/decreased opioid.

7.3 Postoperative

- Position, head up tilt 30 degrees
- Continued monitoring of respiratory status (ie. continuous oximetry)
- Careful analgesic regime and follow up, acute pain service, consider regional anaesthesia techniques and non-sedative analgesics
- Early BiPAP or CPAP, supplementary oxygen, or high flow nasal oxygenation (ie. Optiflow Thrive) 72-96 hours for abdominal incisions
- Early consultation with allied health for requirements for mobilization, appropriate beds and chairs
- Fluids, nutrition, protein supplementation.

(For more comprehensive information refer to related policy or documentation).

8. Transferring patients to another facility

8.1 Considerations for decision making

Decision making around whether to transfer a patient to another facility for treatment is in some cases quite clear and relatively easy to decide (eg. 74 year old, BMI > 45, poorly controlled diabetes, obstructive jaundice, and unstable angina needing an ERCP or cholecystectomy). However, some cases are more complex and not clear and in these instances, it is important for all issues to be considered.

If the situation is in your opinion marginal and all other members of the team assess that to proceed is appropriate, consideration should be given to clearly documenting your concerns. Discuss your concerns with the patient and ask them to acknowledge your concerns and advice by writing them in their patient health record, particularly with respect to the care that may not be immediately available in your facility should complications develop eg. angiography for an acute coronary syndrome in the post-operative period.

Where a patient's risk of a major cardiac event is higher than 12% (based on Lee's Index) due to ischaemic heart disease, obesity, and co-morbid risk factors, consideration for involvement of the patient and their relatives - with their documented acknowledgement of the possible complications - is recommended.

According to the REASON study, patients over the age of 70 years undergoing surgery with an expected inpatient stay of 2 or more days had a 30 day mortality rate in excess of 5%, 10% required admission to an intensive care unit and 20% had complications. Patient factors correlated better with the outcome than did the type of surgery (Anaesthesia, 2010, 65, pages 1022–1030). However, it is also important to consider that removal of elderly patients from familiar faces and family support in itself increases mortality.

Consideration of all of the above factors and the involvement of all team members in the decision making process (including consultation with relevant representatives from the facility to which the patient is being transferred if required) and the family is recommended.

9. Guideline revision and approval history

Version	Modified by	Amendments authorised	Approved by
V1.1	Karen Hamilton	Initial re-draft	Ivan Rapchuk, Co-Clinical Chair, SWAPNet
V1.2	Karen Hamilton	Following initial consultation with broader network	Ivan Rapchuk, Co-Clinical Chair, SWAPNet
V1.3	Karen Hamilton	Reviewed by Ivan Rapchuk	Ivan Rapchuk, Co-Clinical Chair, SWAPNet
V1.4	Karen Hamilton	Tabled at SWAPNet Steering Committee 3/2/17	Ivan Rapchuk, Co-Clinical Chair, SWAPNet
V2.0	Karen Hamilton	Endorsed at the meeting on 3 February 2017	SWAPNet Steering Committee

10. Approval and Implementation

Policy Custodian:

Deputy Director-General, Clinical Excellence Division

Approving Officer:

Dr John Wakefield, Deputy Director-General, Clinical Excellence Division

Approval date: 13 February 2017

Effective from: 1 March 2017

Background information

According to the Australian Bureau of Statistics 2008 data, the proportion of adults (aged 18 or over) classified as obese or overweight increased from 56% in 1995 to 61% in 2007-08 (men increased from 64% to 68% and women increased from 49% to 55%) resulting in health system costs, productivity declines and carers costs in 2008 totalling approximately \$58 billion making it the single biggest threat to public health in Australia.

Obesity affects all age groups and contributes to numerous and varied co-morbid conditions. Complications can occur in many organ systems, ranging from cardiovascular to respiratory to orthopaedic and even ophthalmologic. Overweight and obesity are known risk factors for heart disease, diabetes, hypertension, gallbladder disease, osteoarthritis, sleep apnoea and other breathing problems, and some cancers (uterine, breast, colorectal, kidney, and gallbladder). In addition, obesity is associated with pregnancy complications, high blood cholesterol, menstrual irregularities, hirsutism (excessive hair growth), stress incontinence, psychological disorders, and increased surgical risk.

Obesity-related co-morbidity requires specific intervention and management on the part of the anaesthetist and modifies perioperative and post-operative risk. Obese patients presenting for anaesthesia and surgery are likely to suffer a number of obesity related co-morbidities. The majority of these are related not only to the severity of overweight or obesity, but also to their duration. Most require independent consideration and management. The effects of these co-morbidities may be more severe and less predictable than in non-obese individuals. Appropriate investigation and control of obesity related conditions are best handled by a multidisciplinary team approach.

Morbid obesity is associated with increased morbidity and mortality; reduces life expectancy by up to 10 years; increases occupational health and safety risks for staff delivering health care services and presents a significant risk factor for anaesthesia and surgery. It complicates airway management and increases the risk of gastric reflux and aspiration. Fat acts as a reservoir for anaesthetic agents making it difficult to accurately titrate doses. Cardiovascular co-morbidities, diabetes and deranged respiratory mechanics further increase the risk.

Queensland status

In Queensland, obesity is a growing health issue. In 2011, 57.4% of the adult population weighed more than is recommended for good health making obesity the largest single contributing risk factor for premature death and disability overtaking tobacco.

Patients with BMIs greater than 40, 50 and 60 are presenting to Queensland Health facilities for elective surgery. These patients pose an increased burden on the health system as they require additional pre and post operative care and additional resources in terms of staff and equipment.

Clinical Service Capability Framework

The Clinical Services Capability Framework (CSCF) has been developed to provide a standard set of minimum capability criteria for service delivery and planning in Queensland. The capability of health services is recognised as an essential element in the provision of safe and quality patient care.

The framework outlines the minimum service requirements, staffing, support services and risk considerations for both public and private health services to ensure safe and appropriately supported clinical service delivery (including anaesthesia and surgery), but does not provide any direction in relation to obese patients.

The CSCF Framework and the surgical complexity matrix have been referenced to guide the development of these guidelines and are to be used in conjunction with the Queensland Maternity and Neonatal Clinical Guideline - Obesity.

References and links

1. [http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1370.0~2010~Chapter~Obesity%20\(4.1.6.6.3\)](http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1370.0~2010~Chapter~Obesity%20(4.1.6.6.3))
2. <http://www.aihw.gov.au/obesity-health-priority-area/>
3. <http://www.modi.monash.edu.au/obesity-facts-figures/obesity-in-australia/>
4. http://www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.pdf
5. [Clinical Service Capability Framework, Queensland Health 2011](#)
6. Miller's Anaesthesia, sixth edition, R.D.Miller
7. <http://www.anesthesia-analgesia.org/content/94/3/732.full>
8. <http://www.bjmp.org/content/anaesthetic-management-obese-parturient>
9. <http://www.asaabstracts.com/strands/asaabstracts/abstract.htm;jsessionid=70511C2B9C6C80D74E07F81034A3D6EE?year=2007&index=4&absnum=768>
10. [Queensland Maternity and Neonatal Clinical Guideline - Obesity](#)

CSCF Surgical Complexity Criteria

Surgical complexity I

Surgical complexity I (SCI) (eg. local anaesthetic for removal of lesions), level of complexity:

- is an ambulatory/office surgery procedure
- requires local anaesthetic but not sedation
- requires a procedure room, aseptic technique and sterile instruments but not an operating theatre
- requires access to resuscitation equipment (including oxygen) and a means of delivery
- requires an area where patients can sit, but not a recovery room
- generally does not require post-operative stay or treatment
- does not require support services other than suture removal or a postoperative check.

Day surgery for SCI:

When this definition is applied to patients having day surgery (i.e. those admitted and discharged on the same day), refer to Section 2, Day Surgery Services of the Perioperative Services module.

Surgical complexity II

Surgical complexity II (SCII) (eg. local anaesthetic and/or sedation for excision of lesions), level of complexity:

- is usually an ambulatory, day-stay or emergency department procedure
- requires local anaesthesia or peripheral nerve block and possibly some level of sedation, but not general anaesthesia
- requires at least one operating room or procedure room, and a separate recovery area

Day surgery for SCII:

When this definition applies to patients having day surgery, refer to Section 2, Day Surgery Services of the Perioperative Services module.

Surgical complexity III

Surgical complexity III (SC III) (eg. general anaesthesia for inguinal hernia), level of complexity:

- usually requires general anaesthesia and/or a regional, epidural or spinal block
- requires at least one operating room and a separate recovery room
- may be a day-stay/overnight case or extended-stay case
- may have access to close observation care area/s.

Day surgery for SCIII:

When this definition is applied to patients having day surgery, refer to Section 2, Day Surgery Services of the Perioperative Services module.

Freestanding day hospitals require at least one operating room and a separate recovery room when performing SCIII procedures. Freestanding day hospitals may not provide extended-stay cases.

Surgical complexity IV

Surgical complexity IV (SCIV) (eg. general anaesthesia for abdominal surgery such as laparotomy), level of complexity:

- involves major surgical procedures with low to medium anaesthetic risk
- usually requires general anaesthesia and/or a regional, epidural or spinal block
- has potential for perioperative complications
- has a close observation care area
- has access to intensive care services
- may have capacity to provide emergency procedures.

Surgical complexity V

Surgical complexity V (SCV) (eg. general anaesthesia for any major or complex surgery), level of complexity:

- includes major surgical procedures with high anaesthetic risk
- includes surgery and anaesthetic risk with the highest potential for intra- and post-operative complications
- provides the most complex surgical services
- requires specialist clinical staff, equipment and infrastructure has on-site intensive care services
- may have extensive support services available.

Note: Developed by the CSCF Surgical, Perioperative and Anaesthetic Services Advisory Groups (acknowledging the gap in surgical descriptors between intermediate and complex within the CSCF version 2.0).

ASA Physical Status Classification System

ASA PS Classification	Definition	Examples, including but not limited to
ASA I	A normal healthy patient	Healthy, non-smoking, no or minimal alcohol use
ASA II	A patient with mild systemic disease	Mild diseases only without substantive functional limitations. Examples include (but not limited to): current smoker, social alcohol drinker, pregnancy, obesity (30 < BMI < 40), well-controlled DM/HTN, mild lung disease
ASA III	A patient with severe systemic disease	Substantive functional limitations; One or more moderate to severe diseases. Examples include (but not limited to): poorly controlled DM or HTN, COPD, morbid obesity (BMI ≥40), active hepatitis, alcohol dependence or abuse, implanted pacemaker, moderate reduction of ejection fraction, ESRD undergoing regularly scheduled dialysis, premature infant PCA < 60 weeks, history (>3 months) of MI, CVA, TIA, or CAD/stents.
ASA IV	A patient with severe systemic disease that is a constant threat to life	Examples include (but not limited to): recent (< 3 months) MI, CVA, TIA, or CAD/stents, ongoing cardiac ischemia or severe valve dysfunction, severe reduction of ejection fraction, sepsis, DIC, ARD or ESRD not undergoing regularly scheduled dialysis
ASA V	A moribund patient who is not expected to survive without the operation	Examples include (but not limited to): ruptured abdominal/thoracic aneurysm, massive trauma, intracranial bleed with mass effect, ischemic bowel in the face of significant cardiac pathology or multiple organ/system dysfunction
ASA VI	A declared brain-dead patient whose organs are being removed for donor purposes	

*The addition of “E” denotes Emergency surgery: (An emergency is defined as existing when delay in treatment of the patient would lead to a significant increase in the threat to life or body part).

Last approved by the ASA House of Delegates on October 15, 2014 □□Committee on S, Practice P, Apfelbaum JL, Connis RT, Nickinovich DG, American Society of Anesthesiologists Task Force on Preanesthesia E, et al. Practice advisory for preanesthesia evaluation: an updated report by the American Society of Anesthesiologists Task Force on Preanesthesia Evaluation. *Anesthesiology*. 2012;116(3):522-38.