INTRAOPERATIVE NURSING CARE OF THE OBESE ADULT PATIENT: An e-Learning Guide

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TABLE OF CONTENTS

• Introduction	3
• Anesthetic Considerations	7
• Surgical Considerations	17
• Intraoperative Teamwork and Communication	24
• Special Circumstances	30
 Patient Communication and Ethical Considerations. 	.33
• Learning Comprehension Assignment	.38
• Links	44
• Videos	45
• References	46

INTRODUCTION

Welcome nursing students and nurses with some perioperative care knowledge, interested in furthering their expertise in intraoperative patient care by exploring the special considerations of one of the most common patient groups treated in the operating theater. The obese, adult patient.

Using both international and Finnish national science and evidence-based research, this guide will examine patient safety, nursing competency, efficiency and communication, as well as provide ethical considerations during the surgical treatment of the obese, adult patient. These will be considered through the perspectives of three primary nursing roles in the operating theater: anesthetic nursing, circulating nursing and scrub nursing.

The main learning objective of this e-learning guide is to facilitate and improve the knowledge and skills of nursing students and nurses interested in providing safer and more efficient care by learning about the unique risks, challenges and considerations involved in the intraoperative nursing care of obese, adult patients.

Using evidence-based research in order to inspire the creative thinking necessary for intraoperative nursing, an assignment will be provided, assessing critical understanding of the material and encouraging solution-based problem solving.

WHY IS THIS IMPORTANT?



- From 1995-2016, obesity has over tripled in the global population, from 200 million to 650 million. -WHO 2017, 2020
- In Finland, 38% of women and 26% of men over 30 are obese. -THL 2017
- Obesity increases the risk of noncommunicable chronic diseases, hugely affecting the cardiovascular and musculoskeletal systems as well as contributing to some cancers, resulting in a disproportionate representation of obese patients compared to nonobese patients, requiring surgical intervention. -WHO 2017
- Obesity is likewise associated with more surgical complications, higher infection rates, poorer surgical outcomes and increased morbidity and mortality.
 Stephen et al. 2014
- In other words, the obese patient group is a common patient group within the intraoperative environment, requiring the increased knowledge, attention and innovation of intraoperative nurses in order to best advocate for their patients.

REVIEW: What is obesity?

 The World Health Organization (WHO) recognizes obesity as the physical and physiological impact of a form of malnutrition associated with the "increased intake of energy dense foods that are high in fats and sugars" combined with "physical inactivity."

• Obesity is broadly measured by body mass index, or BMI (weight in kg/height in m²).

Obesity

• BMI 30-34.9

Severe Obesity

• BMI 35-39.9

Morbid or Complex Obesity

• BMI >40

Super Obesity

• BMI >60

-Käypä Hoito 2020, Leonard et al. 2015

BARIATRIC SURGERY vs. SURGICAL PATIENT WITH OBESITY

SURGICAL TREATMENT OF A PATIENT WITH OBESITY AND THE SURGICAL TREATMENT OF OBESITY SHOULD NOT BE MISTAKEN FOR BEING THE SAME THING.

BARIATRIC SURGERY: Is a surgical specialty defined by the surgical treatment of obesity, such as with gastric bypass surgery.

-Stephenl et al. 2014

SURGICAL PATIENT WITH OBESITY: Is

a patient who is undergoing any surgical intervention not directly related to the treatment of obesity, such as with an appendectomy or CABG.

This e-learning guide will focus on the surgical treatment of patients with obesity, and not on bariatric surgery specifically.

ANESTHETIC CONSIDERATIONS

Obese patients are associated with a 30% increase incidence of difficult or failed intubation, due to indicators like larger neck circumference (>60cm) and/or presence of obstructive sleep apnea (OSA).

The anesthetic nurse must therefore use careful and effective planning and preparation for potential airway management issues before the induction and during the maintenance of anesthesia.

-Lang et al. 2017, Nightingale et al. 2015

INDUCTION POSITION

Positioning equipment, assistance and a step for the intubating anesthesia member should be anticipated

The recommended position during induction is the ramped, head-up position (using towels or wedge) or positioning the patient in Reverse Trendelenburg at a 20°-45° angle.

PROPER POSITIONING WILL:

Improve oxygenation, ventilation, and visualization through direct laryngoscopy.

1

Reduce the risk of gastroesophogeal reflux and subsequent aspiration.



AIRWAY MANAGEMENT

PREOXYGENATION

Preoxygenation is vital for the obese patient group.

 Augmenting functional residual capacity (FRC) and extending safe apnea period.

EXAMPLE:

 Use 10L/min nasal prong oxygen supplementation or pressure support ventilation with fitted mask, to provide CPAP.

VENTILATION

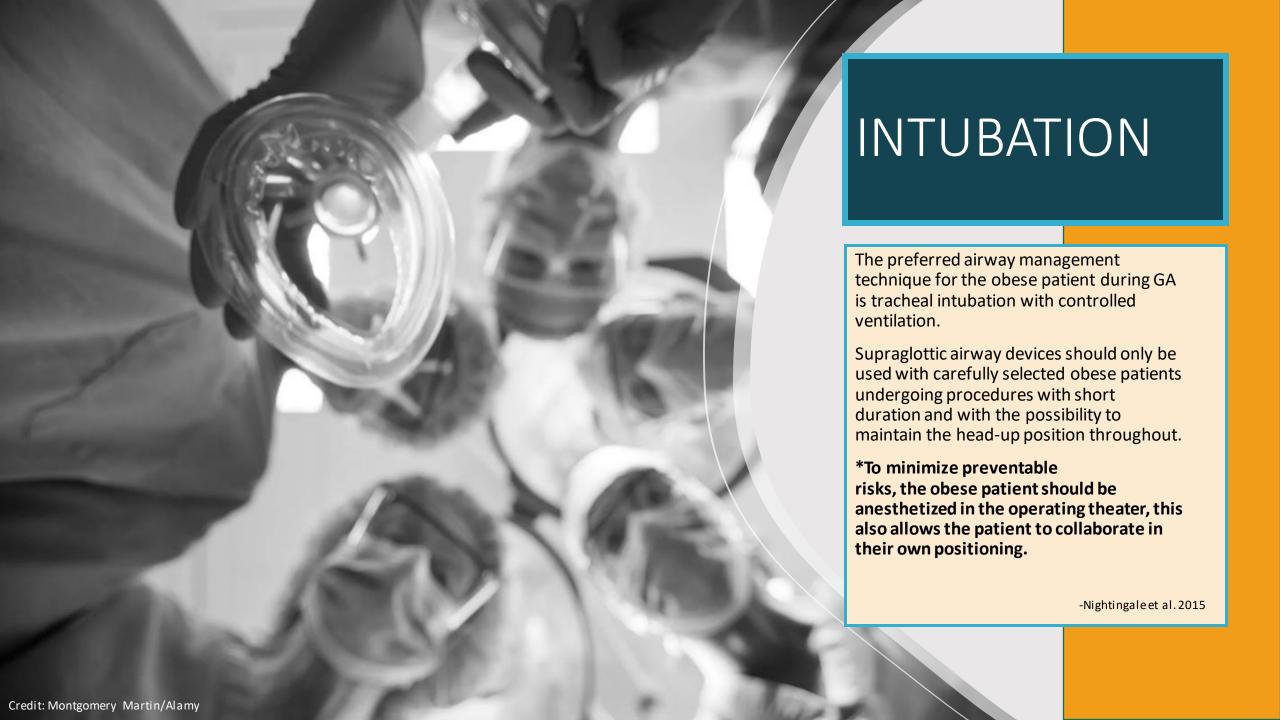
Obesity is an independent predictor of difficult bag-mask ventilation.

This should only be performed by experienced staff.

The airway management technique of choice for the obese patient during general anesthesia (GA) is tracheal intubation with controlled ventilation.

To ensure proper seal of the mask, ask the patient to remove any facial hair prior to surgery

-SWAPNet 2017 Nightingale et al. 2015



SECONDARY ANESTHETIC CONSIDERATIONS

FLUIDS & BODY TEMPERATURE

Fluid management can be challenging with the obese patient group due to the difference in body fluid compartments compared to non-obese patients.

*In normal circumstances, approximately 4-5L of crystalloids per 2 hours of operation, with urine output of 1mL/kg/h, should be adequate.

As with the non-obese patient group, body temperature is important to maintain during surgery. Heated IV fluids and active forced-air warming devices are recommended.

-Leonard et al. 2015

PERIPHERAL CIRCULATION

Obesity is an independent risk factor for perioperative venous thromboembolism (VTE) or deep vein thrombosis (DVT).

All obese patients should receive VTE prophylaxis which includes perioperatively administered anticoagulant chemoprophylaxis and sequential compression devices.

*Ensure the medication is available, adequately sized compression devices are correctly applied onto the patient, and the equipment is appropriately turned on and functioning.

-Lang et al. 2017, Leonard et al. 2015, Nightingale et al. 2015

INTRAVENOUS ACCESS

*Intravenous access is often more challenging in obese patients, here are a few tips:

- Gain experience with difficult IV catheterization
- Have support from the anesthesiologist
- Have access to an infrared vein viewer or ultrasound
- Utilize an armboard to aid IV catheterization.

For super obese patients (BMI >60): invasive arterial or pulmonary catheter kits may be required



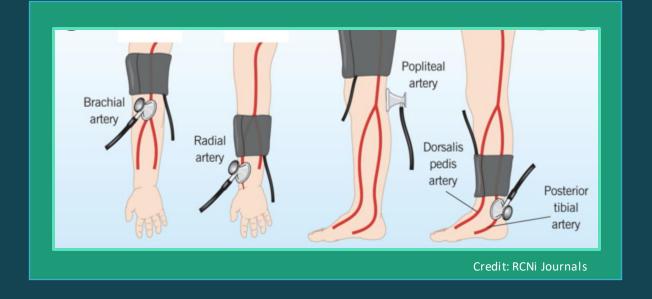
-Leonard et al. 2015, SwapNet 2013

ANESTHETIC EQUIPMENT

*Ensure any
monitoring
equipment and
otherwise needed
equipment are
suitable for the size
of the patient

BLOOD PRESSURE (BP) CUFFS: LENGTH should be at least 75%, and WIDTH at least 40%, of the arm's circumference => If necessary, BP cuff can be placed on wrists or ankles.

OTHER POSSIBLE EQUIPMENT: Extra-long spinal-or epidural needles, nerve stimulator, large/long tourniquets.



EXTUBATION Emerging from anesthesia can involve a high incidence of potential risks for the obese patient group, and thus requires a plan, such as the **DAS Extubation Guidelines:** https://das.uk.com/content/das-extubation-guidelines A nerve stimulator should be used to guide the reversal of a neuromuscular blockade. Motor capacity should be restored before waking the patient. Return of airway reflexes with good tidal volume breathing should be present. The patient should be awake and sitting prior to extubation. *Patients with OSA may benefit from a nasopharyngeal airwayto be inserted prior to waking in order to assist with the partial airway obstruction. -Carron et al. 2020, Nightingale et al. 2015 Credit: Christopher Silas Neal, NY Times

EMERGENCY AIRWAY PREPAREDNESS



Familiarize yourself with the difficult airway guidelines followed by your hospital.

EXAMPLE:
-DAS Difficult
Intubation
Guidelines.

https://das.uk.com/files/das2015 intubation_guidelines.pdf



Locate the
Difficult Airway
Cart, and make
sure it is easily
accessible.

Double check that the cart contains supplies suitable for obese patients.

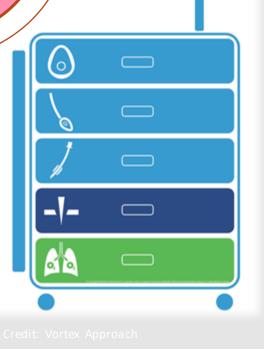


Ensure that a video laryngoscope, cricothyroidotomy/ tracheotomy kit, and fiberoptic larygoscope are available.

A plan should always be in place for airway management.

-Carron et al. 2020, Nightingale et al. 2015

Plan for the unexpected before the patient enters the OR



ASA Obesity and Anesthesia Video

Please click on the video directly, or copy and paste the below link into a search engine in order to access the video.

https://youtu.be/jieCaX6LIU0



SURGICAL CONSIDERATIONS

During the surgical treatment of obese patients, there are a few essential risks to be aware of. Due to increased body mass and the higher potential for underlying comorbidities, obese patients are more prone to poor surgical outcomes compared with non-obese patients.

These risks can be reduced with increased nursing knowledge of patient positioning, available equipment and instrumentation intended for bariatric use, surgical site prep, and staff communication.

-Hughes 2020

RISK FACTORS

PATIENT FACTORS

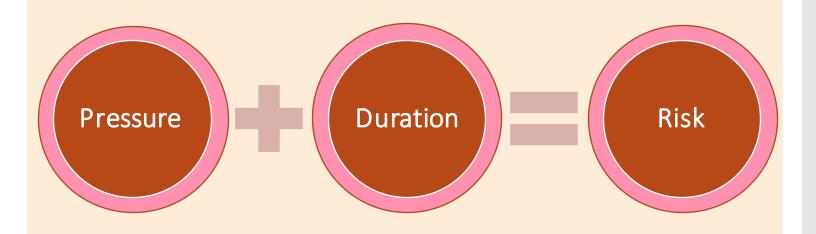
- Obesity related comorbidities. Ex: diabetes and hypertension.
- Heightened inflammatory response caused by obesity.
- Hypovascularity of excess adipose tissue.
- Compromised skin integrity due to increased microbial growth between skin folds.

OPERATIVE FACTORS

- Surgical scrub duration
- Skin antisepsis
- Preoperative shaving
- Skin prep
- Duration of the operation
- Antimicrobial prophylaxis
- Drains/Suture material
- Surgical Technique.

-Gupta et al. 2008

POSITIONING INJURIES



*It is the responsibility of the circulating nurse to make a full body assessment of the skin condition prior to surgery and immediately following surgery, making note of skin intactness around the surgical site, and more broadly.

Positioning injuries include:

pressure injuries, nerve damage, circulation risks and skeletomuscular pain.

Excess weight contributes to both poor skin condition and the increased risk of damaged skeletal muscle.

Increased body mass is associated with extra skin folds which are both hypoperfused and trap moisture, creating ideal spaces for bacteria and yeast to flourish, consequently breaking down the skin.

Combined with poor skin condition, immobility, and excess weight of the patient, contribute to the increased susceptibility to pressure injury. -VanWicklin 2018

PREVENTING POSITIONING INJURIES

NON-STERILE PRECAUTIONS

- Ensure that IV tubing, catheters, cords, or other medical equipment are not resting under the patient or within any crevices.
- Strictly adhere to the same guidelines for safe positioning as with non-obese patients.
- Place a roll under the patient's right flank, relieving pressure from the vena cava while in the supine position.

-Fencl et al. 2021, VanWicklin 2018

STERILE PRECAUTIONS

- Ensure that the sterile backtable and mayo stand are not resting on the patient during surgery.
- Take care that sterile instrumentation, such as table-fixed surgical retractors don't pinch or press into the patient.
- Be aware of sterile personnel leaning on the patient.



- Ensure the OR table can accommodate the patient based on weight limitations.
- Normal anatomical landmarks may be more challenging to locate on obese patient. Thus, straps and safety belts should be wide enough and long enough so they don't press skin folds down onto the body, or seed into crevices.
- Use smarter padding material rather than more padding material in order to avoid creating unintended pressure points, preferring gel pads over foam padding.
- Have extra-long surgical instrumentation and sterile supplies on hand.
- Be prepared with unconventional sterile drape options in order to provide adequate exposure of the surgical site.

Fencl et al. 2021, Hughes 2020

PLANNING FOR TRANSFER

Once the patient is induced, the ability to safely move the patient is jeopardized for both the patient and staff.

*Plan for extra staff to help during transfer

Consider having the patient take part in their own positioning by transfering themselves onto the OR table.

Depending on necessity, consider placing x-ray film plates and anesthesia positioning aids on the OR table, prior to induction.

Be aware of proper ergonomics in order to prevent personal injury.

*Plan for post-operative patient transfer prior to surgery

Soft, lateral transfer devices such as air assisted transfer devices or mechanical lift sheets and slider sheets can be placed directly on the OR table, for later use.

Arrange for an extra-wide hospital bed to be available following the surgery.

-Dunn 2005, Hammond 2013



Please click on the video directly, or copy and paste the below link into a search engine in order to access the video.

PREVENTING SSI's

Decreasing the risk of surgical site infection (SSI's) in the obese patient requires multidisciplinary action; however, surgical nurses are specifically culpable for decreasing nosocomial infection by mechanical means:



Rigorously follow scrub guidelines, and hand hygeine recommendations.

Choose prep solutions based on the size of the patient and skin integrity, anticipating more prep solution or applicators in order to meet manufacturer recommendations for surface coverage and skin antisepsis.

Reduce foot traffic within the operating theater by anticipating required equipment, instrumentation and testing supplies prior to surgery.

Maintain sterility of the sterile field and scrubbed personnel.

INTRAOPERATIVE TEAMWORK & COMMUNICATION

Intraoperative teamwork is the driving force behind successful, safe and effective surgical care of the obese patient. Obesity is a significant risk factor for those undergoing surgery and OR staff must come together to anticipate the unexpected before complications arise. The chaotic narrative of the unexpected can be assuaged with routine use of checklists, safety briefings, and guidelines which reinforce effective communication and teamwork.

REVIEW: Intraoperative Nursing Roles

Anesthetic Nurse

 Part of the anesthetic team: planning, administering and monitoring anesthesia and maintaining the airway

Circulating Nurse

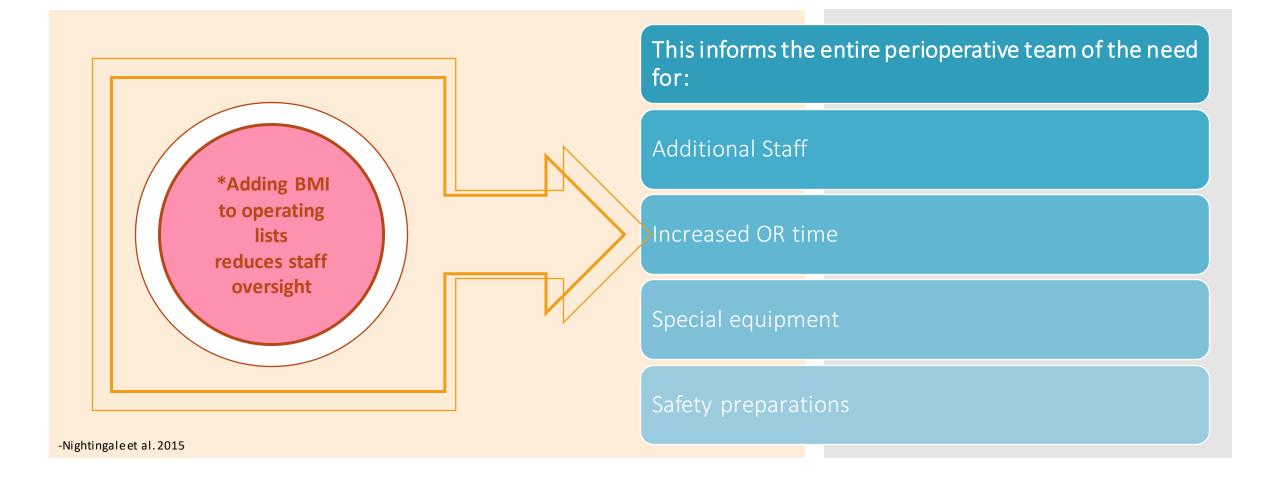
 Part of the surgical team: functioning outside of the sterile field, leading patient safety functions, positioning, charting and communications

Instrument or Scrub Nurse

 Part of the surgical team: functioning within the sterile field, anticipating the needs of the surgeon



WHAT DOES BMI TELL US?



Anaesthesia for the Obese Patient

Society for Obesity and Bariatric Anaesthesia

re-operative Evaluation

Red Flags A

- Poor functional capacity
- Abnormal ECG Uncontrolled BP, CCF or IHD
- SpO2 <94% on air
- If bicarbonate >27, OHS likely
- Previous DVT/PE
- STOP-BANG≥5
- OS-MRS >3
- Metabolic Syndrome High NSQIP ACS Risk





- Preoperative CPAP
 Blood Gases / Sleep Studies
- Echocardiogram Cardiorespiratory referral
- Experienced Anaesthetist
- Book HDU Bed
- May be suitable for day-case



tools.farmacologiaclinica.info

riskcalculator.facs.org/RiskCalculator

Consider premed antacid & analgesia Careful glucose control

Minimal induction to ventilation time

Avoid spontaneous ventilation, use PEEP

Use short-acting inhalationals or TIVA

Commence maintenance promptly Tracheal intubation recommended

Caution with SAD in BMI >40

DVT prophylaxis Self-position on operating table

Preoxygenate and intubate in

ramped/sitting position Consider CPAP and HFNO



NSQIP ACS Risk Calculato

OS-MRS Calculator

Central Obesity

(waist > half height)

- Difficult airway/ventilation more likely
- Greater risk of CVS
- disease/thrombosic
- Higher risk of metabolic syndrome



Peripheral Obesity (Fat outside body cavity)

- · Less co-morbidity
- · Lower risk



STOPBANG Calculator

www.stopbang.ca

Anaesthetic Technique:

ntra-operative Management

- Suggested Equipment:
 Suitable bed/trolley and operating table
- Gel padding
- Wide strapping
- Table extensions/arm boards
- Forearm cuff or large BP cuff
- Device or equipment for ramping Step for anaesthetist
- Difficult airway equipment
- Videolaryngoscope Ventilator capable of PEEP & pressure modes
- Hover mattress or equivalent
- Long spinal, regional and vascular needles
- Ultrasound machine

Ideal Body Weight: Broca formula

Women: height (in cm) - 105

Usual discharge criteria should be met

DSA or Obesity Hypoventilation Syndrome: Sit up and avoid sedatives and post-op opioids

No evidence of hypoventilation

Lean Body Weight: This exceeds ideal body weight in the obese and plateaus at:

If in doubt, titrate and monitor effect

SpO2 should be maintained at pre-op levels with minimal O2 therapy

- Appropriately sized calf compression devices
- Depth of anaesthesia monitoring
- Neuromuscular monitoring
- Sufficient staff to move patient

≈100kg for a man

ost-operative Care

≈70kg for a woman

Men: height (in cm) - 100



Ramping

- Tragus level with sternum

Reduces risk of difficult laryngoscopy

Improves ventilation and pre-oxygenation

- Short-acting opioids & multimodal analgesia

PONV prophylaxis Ensure full NMB reversal

Extubate and recover sitting up Suggested dosing for anaesthetic drugs

- (Males Max 100Kg Females Max 70Kg) Ideal plus 40% excess)
- Propofol induction
- Fentanyl and Alfentanil
- Morphine Non-depolarising NMBDs
- Paracetamol Local Anaesthetics

Propofol Infusion LMWHs (titrate done with Xa levels!

Antibiotics

Neostigmine (max 5mg) Sugammadex (read pack)

General good ward level practice includes:

- · Caution with long-acting opioids and sedatives
- Early mobilisation
- Robust thromboprophylaxis regime
 Experienced Consultant Review

- Reinstate patient's own CPAP if applicable with additional time in recovery until free of apnoeas without stimulation
- Patients untreated, intolerant of CPAP or ineffectively treated (persistent symptoms) are at risk of hypoventilation.

 In these cases, IV opioids should be avoided but where necessary, patient should have continuous SpO₂ monitoring and level 2 care must be considered















Minimize the opportunity for human error. *Routinely rely on hospital packs, checklists and guidelines

SOBA: Anesthesia for the Obese Patient



Obesity Pack

In the box	Large Equipment	Where to find it
Audit form	Bariatric operating table	
Single sheet summary	Step for patient	
Large BP cuff	People!	Recovery, ward
BIS/Entropy stickers	Oxford pillow plus arm attachments	
Large calf compressors	Arm, leg & side extensions	
Long epidural & spinal needles	Hoist	
Arrow 24cm lines	Bed for post op	
Long regional block needles	Desflurane	
Airtrach & bougie	Infusion pumps	
	Ultrasound machine	
Slide sheet	Step for anaesthetist	
Gel padding	Large tourniquet cuff	
Wide Velcro strapping	BIS monitor	
Cricothyroidotomy kit	Patient & fluid warming	
	Large retractors etc	
	Additional gel padding	
	Difficult airway equipment	

WHO: Surgical Safety Checklist

*Initiated by the circulating nurse

a safety checklist makes every intraoperative team member aware of the patient care plan from a multidisciplinary perspective. This addresses the surgical procedure, patient risk factors, equipment and positioning requirements, need for additional staffing, anesthetic approach, and plans for postop care.

Surgical Safety Checklist



Before induction of anaesthesia	Before skin incision	Before patient leaves operating room
(with at least nurse and anaesthetist)	(with nurse, anaesthetist and surgeon)	(with nurse, anaesthetist and surgeon)
Has the patient confirmed his/her identity, site, procedure, and consent? ☐ Yes	□ Confirm all team members have introduced themselves by name and role. □ Confirm the patient's name, procedure,	Nurse Verbally Confirms: The name of the procedure Completion of instrument, sponge and needle
Is the site marked? ☐ Yes ☐ Not applicable	□ Confirm the patient's name, procedure, and where the incision will be made. Has antibiotic prophylaxis been given within the last 60 minutes? □ Yes	counts Specimen labelling (read specimen labels aloud, including patient name) Whether there are any equipment problems to be addressed
Is the anaesthesia machine and medication check complete? ☐ Yes	☐ Not applicable Anticipated Critical Events	To Surgeon, Anaesthetist and Nurse: What are the key concerns for recovery and
Is the pulse oximeter on the patient and functioning? — Yes	To Surgeon: What are the critical or non-routine steps? How long will the case take?	management of this patient?
Does the patient have a:	☐ What is the anticipated blood loss?	
Known allergy? No Yes	To Anaesthetist: Are there any patient-specific concerns? To Nursing Team:	
Difficult airway or aspiration risk? ☐ No ☐ Yes, and equipment/assistance available	☐ Has sterility (including indicator results) been confirmed? ☐ Are there equipment issues or any concerns?	
Risk of >500ml blood loss (7ml/kg in children)? No Yes, and two IVs/central access and fluids planned	Is essential imaging displayed? ☐ Yes ☐ Not applicable	

This checklist is not intended to be comprehensive. Additions and modifications to fit local practice are encouraged.

WHO Video: How to use the Surgical Safety Checklist

Please click on the video directly or copy and paste the below link into a search engine in order to access the video

https://youtu.be/CIFhLUiT8H0



SPECIAL CIRCUMSTANCES

The special considerations covered in this guide have thus far consisted of factors that broadly apply to most surgical disciplines.

However, there are a few special circumstances that require particular attention, including:

OBSTETRICS and CARDIOPULMONARY RESUSCITATION (CPR).

MATERNAL OBESITY

RISK FACTORS:

- Pre-eclampsia
- Post-partum hemorrhage
- Gestational diabetes
- Anesthetic complications
- Prolonged operative time
- Venous thromboembolism
- Aortocaval compression
- Wound infection
- Epidural failure
- Reflux and aspiration
- Challenging vascular access
- Difficult airway

SOLUTIONS:

- Establish early vascular access
- Prepare ultrasound for central neuraxial blockade
- Ensure difficult airway cart is easily accessible
- Administer prophylactic antibiotics and antacids
- Tilt the OR table left to relieve aortocaval compression.
- Have blood transfusion products ordered and ready

Labor is
unpredictable, be
prepared with a
flexible plan
for caesarean
section and other
obstetric related
surgical
interventions.



CPR TROUBLE SHOOTING



Ineffective defibrillation

Challenging vascular access

Difficult airway access

Optomize body position during CPR

• Use a step, platform, or apply compressions from the patient's head end.

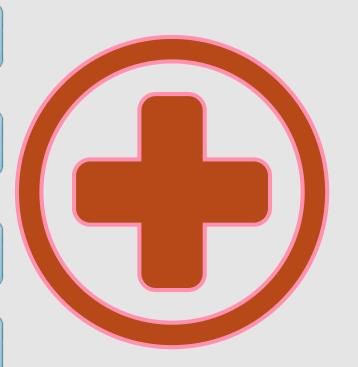
Recognized ineffective defibrillation immediately

- Adjust pad placement
- Increase shock levels

IV Access is essential -consider the need for intraosseous (IO) access

• Preferring the upper humerus

CPR should be synonymous with immediate access to the difficult airway cart



PATIENT COMMUNICATION & ETHICAL CONSIDERATIONS

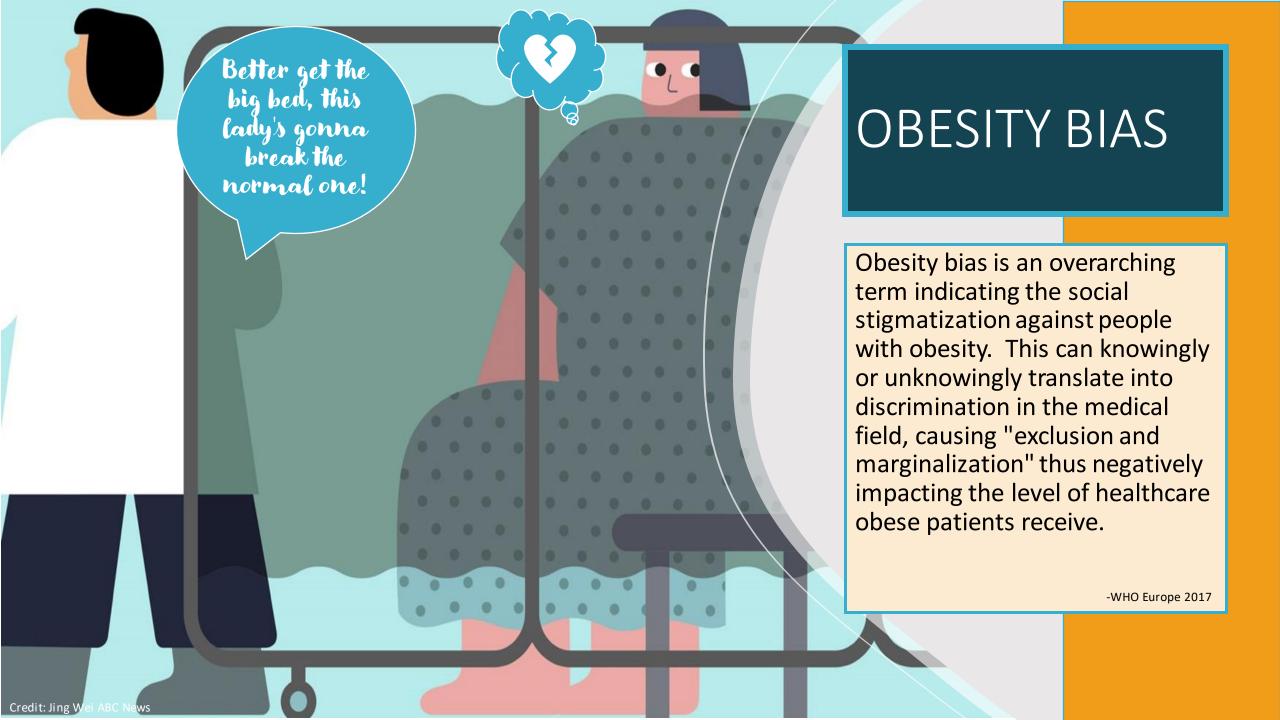
Anticipating a surgical procedure is a vulnerable experience for all surgical patients, causing a range of feelings from nervousness and embarrassment to severe anxiety and fear.

As the patient is not often an active participant in their surgical experience, it is necessary to create an environment of support and trust, not only by using compassionate communication methods, but by creating a physical environment that elicits confidence in the entire process.

In alignment with patient and staff safety guidelines and ethical treatment of patients, creating this environment specifically for the obese patient means being prepared with equipment and supplies intended for use by a person with obesity.

In essence, fostering an environment that creates a sense of action around preserving patient dignity, cultivates a level of trust in the medical treatment provided.

-Thomas et al. 2011



TANGIBLE BARRIERS

ACKNOWLEDGING THE REALITY

From the intraoperative perspective, a dichotomy exists between providing unbiased care while advocating for the special needs of each individual patient, and suffering the pressures of being understaffed, underfunded, and lacking appropriate equipment and nursing education.

*These barriers to patient care have an impact on patient and staff safety, requiring extra time and planning in order to surpass.

Increase nursing education around obesity and causes of obesity. Normalize the use of obesity packs and safety guidelines, streamlining special considerations of the obese patient group. Increase awareness of available equipment and supplies intended to accommodate, transfer, and safely position obese patients.

Lee et al. 2012

TACKLING SOCIAL STIGMA

Putting an end to the perpetuation of obesity bias can easily begin with the individual healthcare professional using tools to develop compassionate communication skills and educating themselves around understanding obesity as a disease process.

Obesity bias can manifest within the patient as well

Social stigma
against obesity is
as prevalent
amoung medical
professionals as
with the general
public



Don't Ignore

obesity out of

politeness



Don't shame the patient for their weight



Do talk about obesity using supportive language



Do treat obesity as a disease process



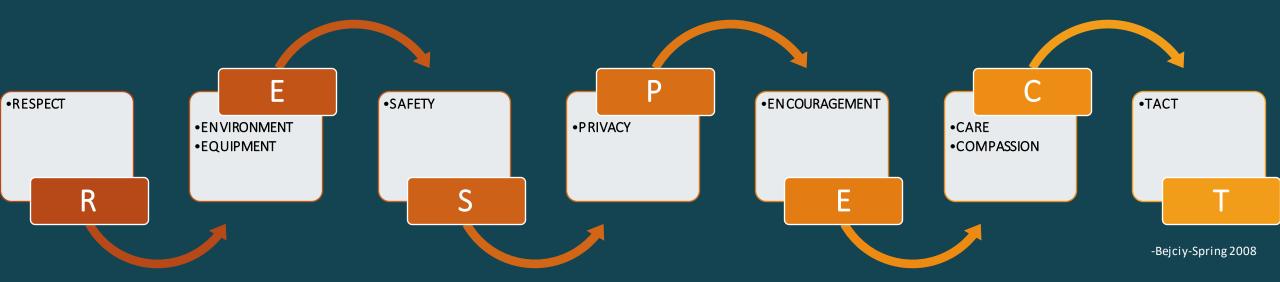
Do involve the patient in their own care plan (ex: plans for positioning and transferring)

-Thomas et al. 2011, Lee et al. 2012

TABLE 1. Supportive language			
OLD	NEW		
Overweight, obese	Person/patient of size		
Will power	Commitment		
Preach	Enable		
Compliance	Exploration		
Should/must	Consider		
Limit, restrict	Choose, experience		
Prescribe	Negotiate		
Approval	Self-esteem		
Expectations	Discoveries		
Good/bad	What works for you		
Diet	Eating style		
Exercise regimen	Activity style		
ldeal weight	Healthy BMI, Healthy Weight, Waist Circumference		

R.E.S.P.E.C.T. MODEL

A MODEL FOR THE SENSITIVE TREATMENT OF BARIATRIC PATIENTS



LEARNING COMPREHENSION ASSIGNMENT

These tasks are intended for nursing students and nurses, and can be completed as part of a group work project followed by discussion, or individually.

Please use the information, links and videos provided in this elearning guide for the upcoming assignment.

PATIENT CASE

PART 1

Max, a 35 year old male, has been admitted to the hospital with severe, lower right abdominal pain. He is diagnosed with acute appendicitis and is scheduled for an emergency laparoscopic appendectomy. His chart shows that he last visited the doctor 10 years ago for heartburn, has a BMI of 58 and has a history of obstructive sleep apnea (OSA). He is otherwise healthy, with no other known diseases, allergies, or prior surgeries. He takes Somac 40mg and vitamin D3 50µg, daily.

PART 2

During the laparoscopic appendectomy, the surgeon accidentally knicks the patient's bowel and cannot repair it laparoscopically. The surgeon makes the decision to convert to an open appendectomy.

PART 3

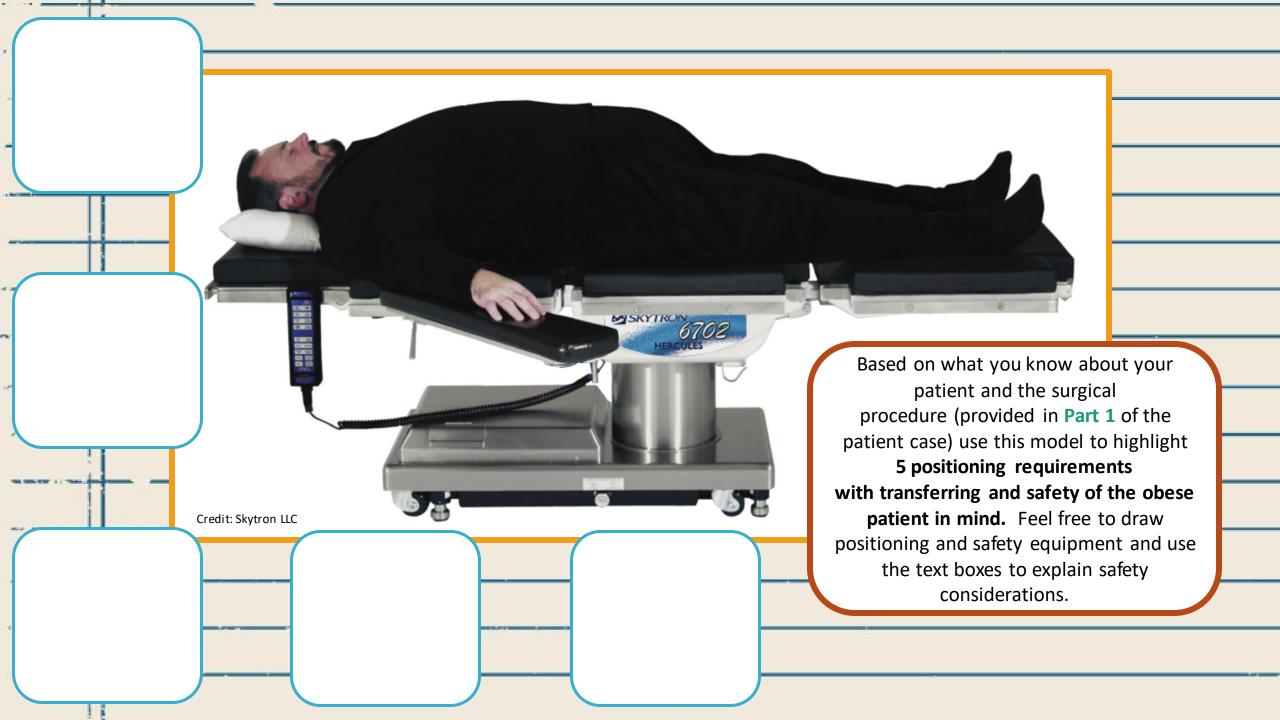
After converting to an open appendectomy, the patient suddenly goes into cardiac arrest and requires resuscitation.

*Max is successfully revived, the surgery is completed without further complications and the patient is awakened in the OR.











ASA Difficult Airway Algorithm (pg

10) https://www.researchgate.net/publication/289965142
Anesthetic-Complications-in-Pregnancy 2016 Critical-Care-Clinics

DAS

Extubation Guidelines https://das.uk.com/content/das-extubation-guidelines

DAS

Intubation Guidelines https://das.uk.com/files/das2015int
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SOBA Obesity Pack https://www.sobauk.co.uk/guidelines-1?lightbox=dataltem-iit6ri461

WHO Surgical Safety

Checklist https://www.who.int/teams/integrated-health-services/patient-safety/research/safe-surgery/tool-and-resources



ASA Obesity and Anesthesia https://youtu.be/jieCaX6LIU0

HoverMatt[®] In the Operating Room https://youtu.be/3NqVOgvRil

SWAPNet Anesthesia: Non-Bariatric Surgery in Obese Patients https://www.sages.org/video/guidelines-for-airway-sleep-apnea-management-in-the-obese-patient/

WHO Surgical Safety
Checklist https://youtu.be/CIFhLUiT8H0

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