



Core Topics York

Friday 7 February 2020

Welcome

 Association of Anaesthetists

This seminar is sponsored by:
 **PHARMACOSMOS**
Committed to Quality

Anaesthesia for morbid obesity

Jon Redman
SOBA Chairman
AAGBI Core Topics
York 2020



Association of Anaesthetists



SOBAUK

THE SOCIETY FOR OBESITY & BARIATRIC ANAESTHESIA



Association
of Anaesthetists

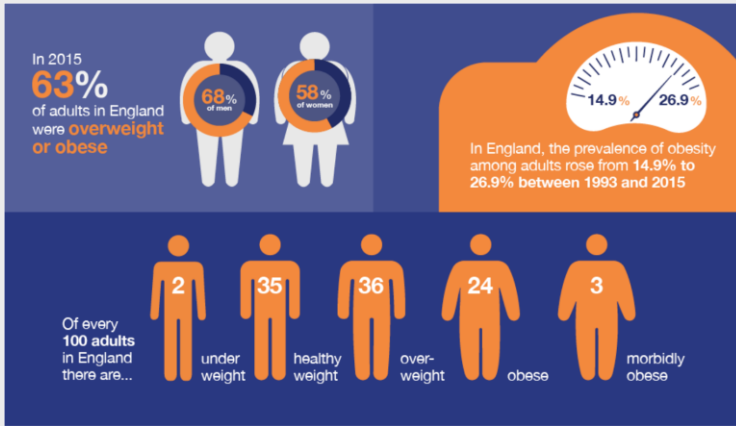
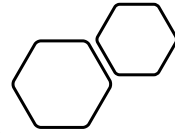


Declarations

- Current SOBA Chairman
- MSD Honorarium

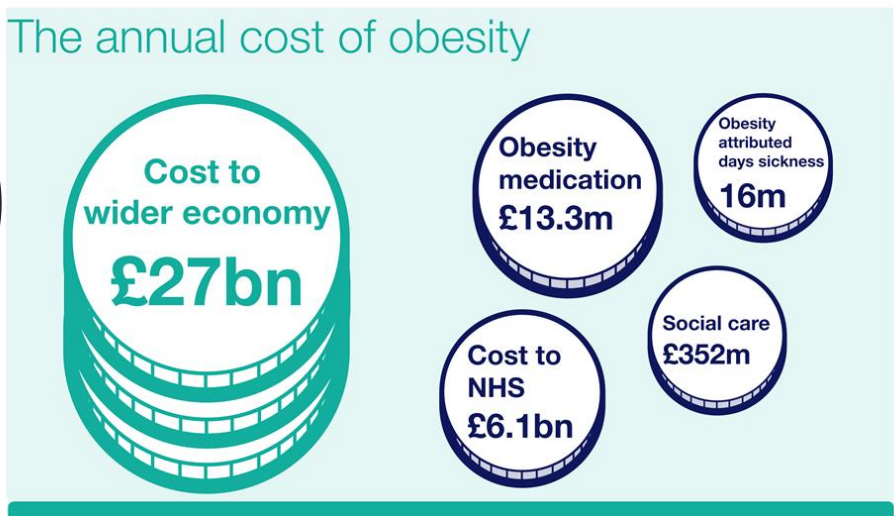
Over 13,000 people with BMI > 40 living
within catchment area of average DGH





The annual cost of obesity

Obesity the wider cost to the UK



Preoperative Redflags

- Weight/BMI ?
- METS
- OSA/OHS
- Risk scoring tools
- Heart Failure



BMI >30 HR 1.5

BMI >35 HR 2.0

BMI >40 HR 2.5

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Body-Mass Index and Mortality in Korean Men and Women

Sun Ha Jee, Ph.D., Jae Woong Sull, Ph.D., Jungyong Park, Ph.D., Sang-Yi Lee, M.D., Heechoul Ohrr, M.D., Eliseo Guallar, M.D., Dr.P.H., and Jonathan M. Samet, M.D.

ORIGINAL ARTICLE

General and Abdominal Adiposity and Risk of Death in Europe

T. Pischon, M.D., M.P.H., H. Boeing, Ph.D., M.S.P.H., K. Hoffmann, Ph.D.,* M. Bergmann, Ph.D., M.B. Schulze, Dr.P.H., K. Overvad, M.D., Ph.D., Y.T. van der Schouw, Ph.D., E. Spencer, Ph.D., K.G.M. Moons, Ph.D., A. Tjønneland, M.D., Ph.D., Dr.Med.Sci., J. Hallajaj, Ph.D., M.K. Jensen, Ph.D., J. Stegger, M.D., F. Clavel-Chapelon, Ph.D., M.-C. Boutron-Ruault, Ph.D., V. Chajes, Ph.D., J. Linseisen, Ph.D., R. Kaaks, Ph.D., A. Trichopoulos, M.D., Ph.D., D. Trichopoulos, M.D., Ph.D., C. Bamia, Ph.D., S. Sieri, Ph.D., D. Palli, M.D., R. Tumino, M.D., P. Vineis, M.D., M.P.H., S. Panico, M.D., M.Sc., P.H.M. Peeters, M.D., Ph.D., A.M. May, Ph.D., H.B. Bueno-de-Mesquita, M.D., Ph.D., M.P.H., F.J.B. van Duynhoven, Ph.D., G. Hallmans, M.D., L. Weinehall, M.D., Ph.D., J. Manjer, M.D., Ph.D., B. Hedblad, M.D., Ph.D., E. Lund, M.D., Ph.D., A. Agudo, Ph.D., L. Arriola, Ph.D., A. Barricane, Ph.D., C. Navarro, M.D., Ph.D., C. Martinez, M.D., J.B. Quirós, M.D., T. Key, D.Phil., S. Bingham, Ph.D., K.T. Khaw, M.B., B.Chir., P. Boffetta, M.D., M.P.H., M. Jenab, Ph.D., P. Ferrari, Ph.D., and E. Riboli, M.D., M.P.H., Sc.M.

Does obesity affect outcome?

Obese having surgery

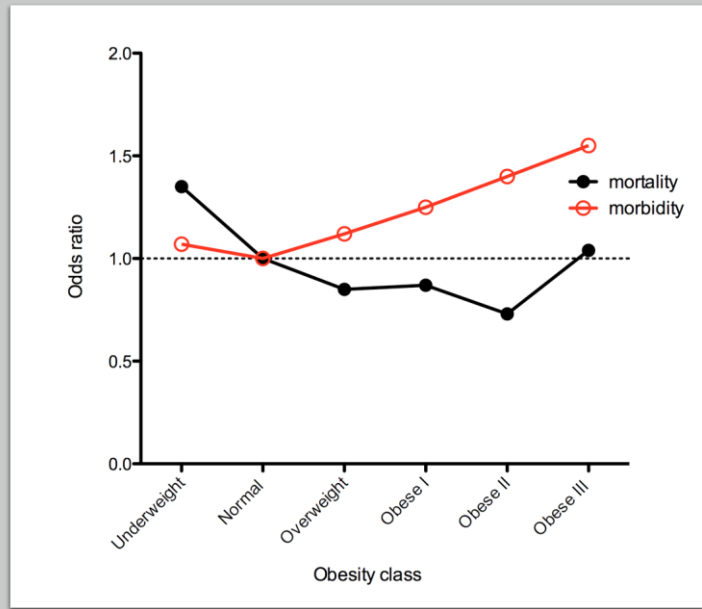
RETROSPECTIVE

UNDERPOWERED

NO MENTION OF DEATH



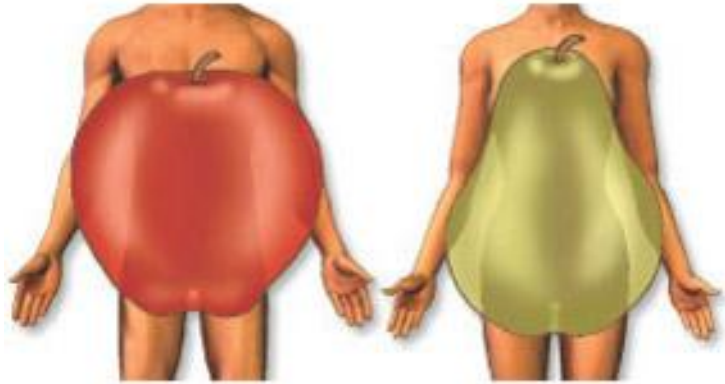
Obesity
Paradox



Mullen. Annals of Surgery 2009;250:166+172

Patient Risk Factors

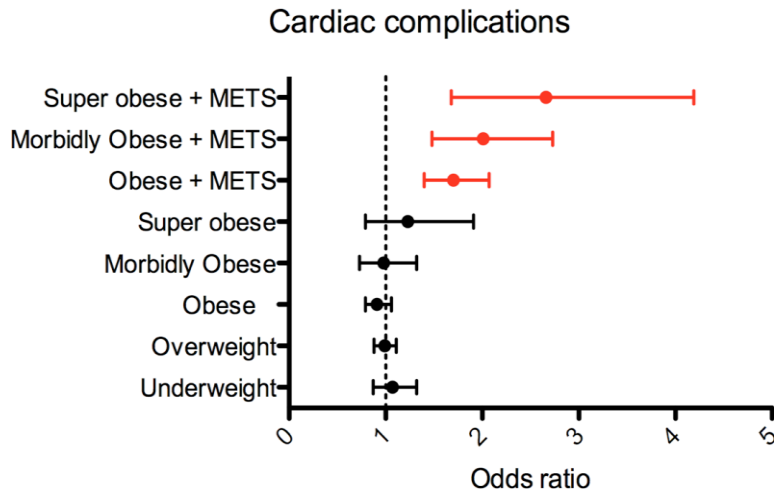
- **BMI**
- **Waist circumference**
- **Waist/hip ratio**
- **Waist/height ratio**



Metabolic Syndrome

Criteria	Essential	Central Obesity	Insulin Resistance	Lipid Profile	Hypertension	Others
WHO	DM or insulin resistance and 2 others	Waist to hip ratio: M>0.9, F>0.85		TAG \geq 150 mg/dl and/or HDL-C : M<35 mg/dl F<39 mg/dl	\geq 140/90	Urine albumin> 20 mcg/min
NCEP	Any three of the following	Waist circumference: M>102 cm F>88 cm	Fasting glucose \geq 110 mg/dl	TAG \geq 150 mg/dl HDL-C: M<40 mg/dl F<50 mg/dl	SAP>130 DAP> 85	
IDF	Waist circumference and any 2 other risk factors	Waist circumference: M>94 cm F>80 cm	Fasting glucose \geq 110 mg/dl or type II DM	HDL-C: M<40 mg/dl F<50 mg/dl or treatment for HDL dyslipidaemia	SAP>130 DAP> 85 or previous HTN treatment	

Implications of MET



Glance Anaesthesiology 2010; 113:959-72

Obstructive Sleep Apnoea

S	Snoring -do you snore loudly (louder than talking or heard through a door?)	Y	N
T	Tired -do you often feel tired or fatigued during the day?	Y	N
O	Observed - Has anyone observed you stop breathing during sleep ?	Y	N
P	Blood Pressure - Do you have or are you being treated for high blood pressure ?	Y	N
B	BMI > 35Kg/m ²	Y	N
A	Age: > 50	Y	N
N	Neck: > 16cm	Y	N
G	Gender: male	Y	N

Risk Scoring Tools

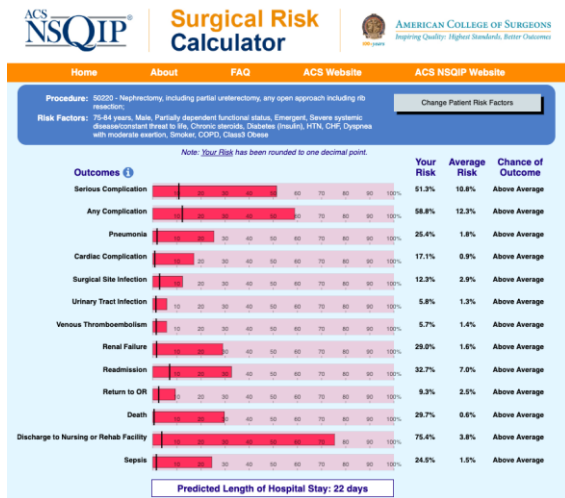
P-POSSUM

SORT

LRCI

EOSS

NSQIP ACS



ACS NSQIP

- INPUT
 - Surgery
 - Co morbidities
 - Weight
 - Height
- OUTPUT
 - Morbidity
 - Mortality

<https://riskcalculator.facs.org/>



OBESITY SURGERY MORTALITY RISK SCORE (OSMRS)

- BMI > 50 kg/m²
- Hypertension
- Male
- Age > 45
- PE risk

CLASS A 0-1 points

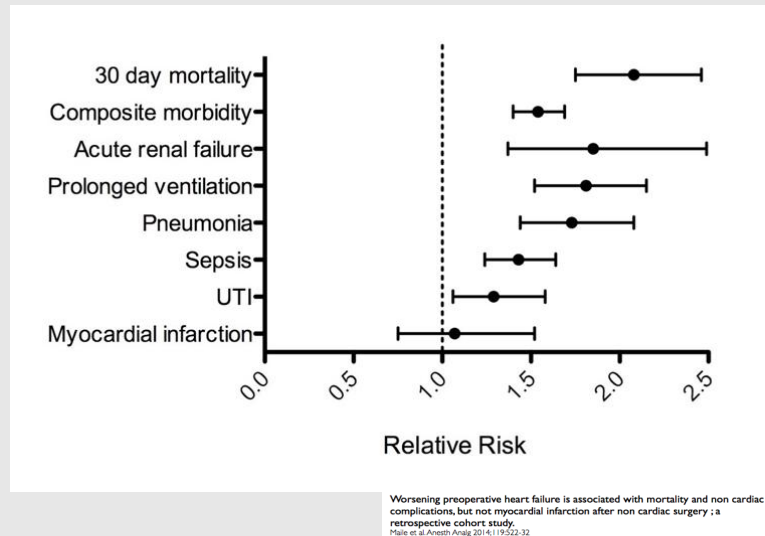
CLASS B 2-3 points

CLASS C 4-5 points

Class	De Maria 2007	De Maria 2009	Efthimiou 2009	Dimitriou 2010	Sarela 2011	Agrawal 2011	Mortality	No. of subjects
A	0.31%	0.23%	0.36%	0%	0%	0%	0.26%	4912
B	1.9%	1.17%	1.49%	0.69%	0%	0%	1.33%	4124
C	7.56%	2.4%	3.08%	0%	6.67%	0%	4.34%	346
Total	1.49%	0.74%	0.8%	0.33%	0.26%	0%	0.88%	9382

OBESITY SURGERY MORTALITY RISK SCORE (OSMRS)

Heart Failure

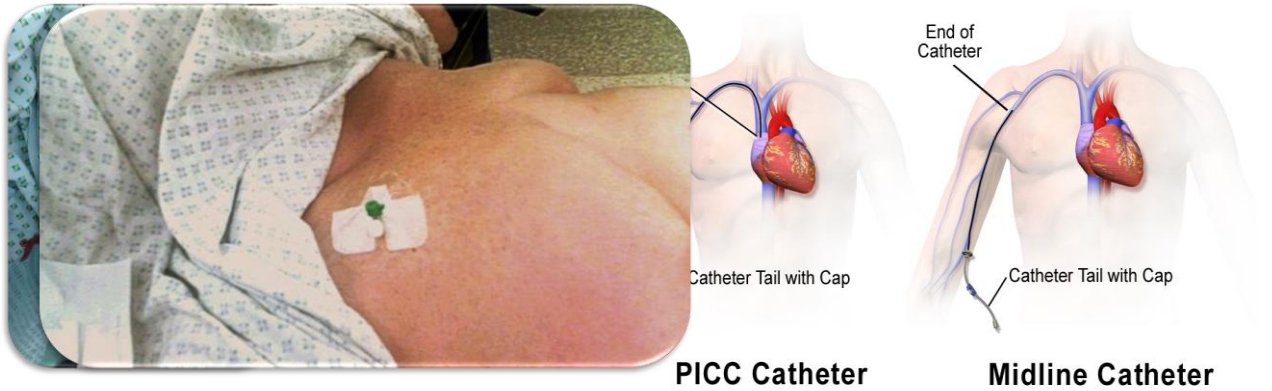


Where do we start?



- Movement - walk
- Self-positioning
- Awareness ↓
- Double sets of kit
- Staff division

Vascular Access



Monitoring

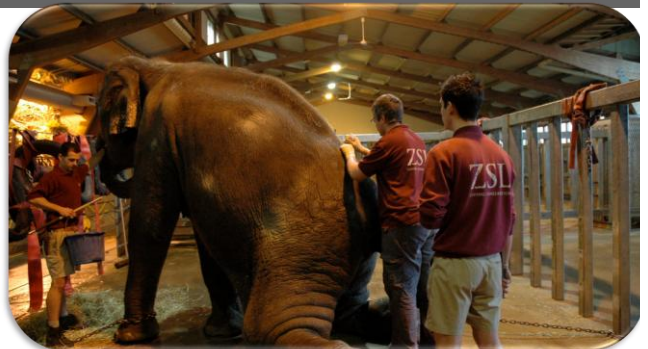
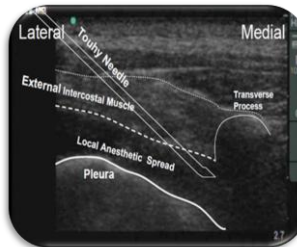
-  Routine 
-  Forearm NIBP 
-  NMB / TOF / PTC 
-  Depth of Anaesthesia 
-  Venous Bicarbonate 

Choice of anaesthetic technique



Regional blocks

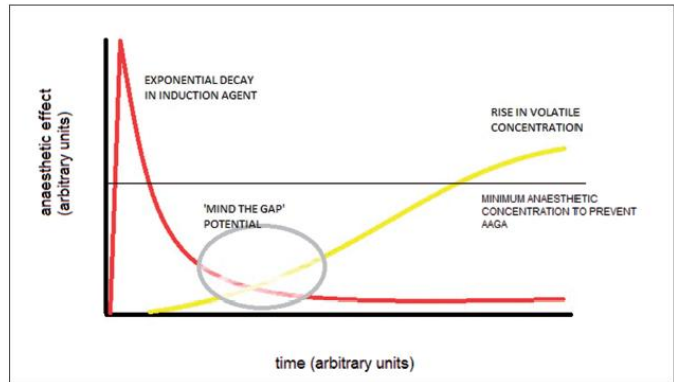
- Awake
- Special equipment
- Mobility restricts ERAS
- Success issues
- NAP 4.....



2013 <http://bariatrictimes.com/regional-anesthesia-for-bariatric-surgery/>

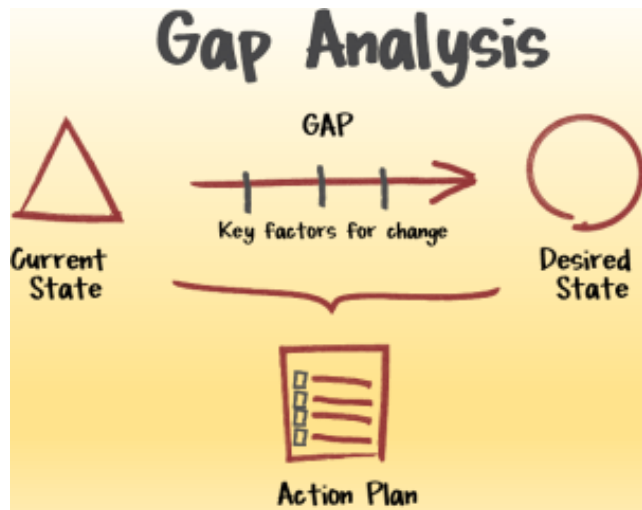
BJ Pain Vol 13; 2: 106-111

Induction and the 'gap'

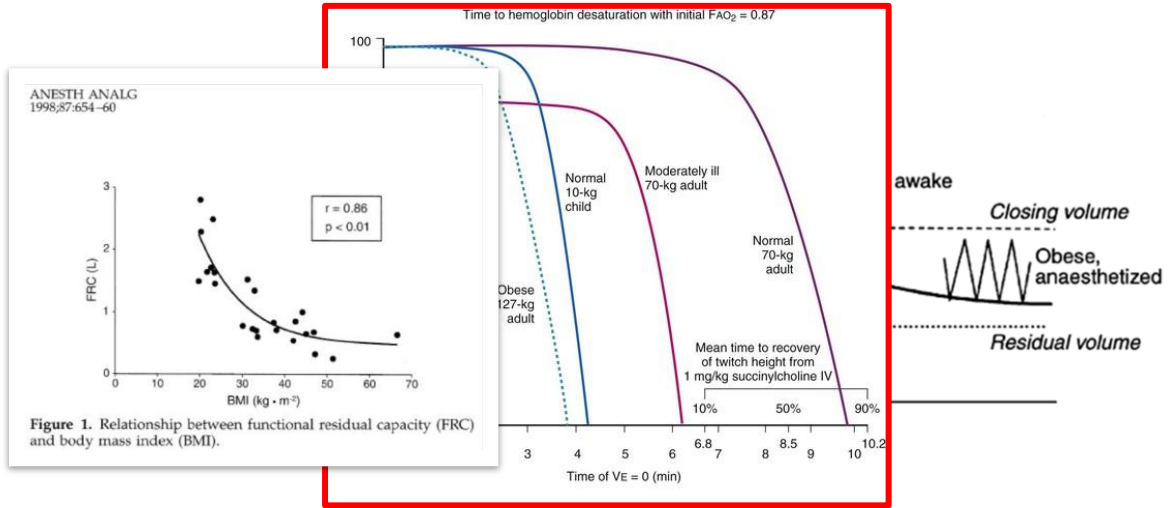


Avoiding awareness

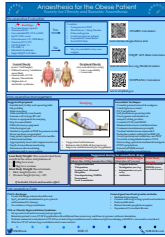
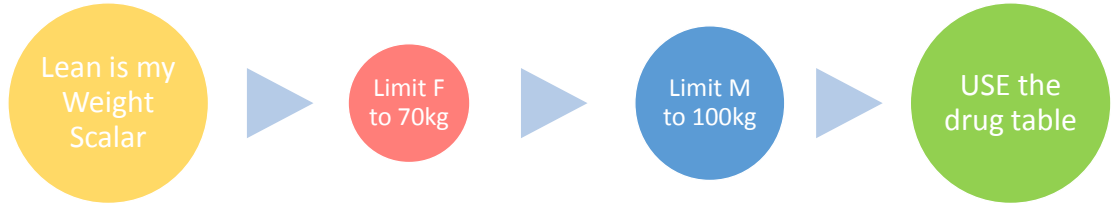
- Theatre for Induction
- Rocuronium – Airway
- BMV ? not RSI
- Bolus Propofol for intubation
- DoA/EEG monitor from start



Some Respiratory Physiology



Correct Drug Doses



Suggested dosing for anaesthetic drugs		
Lean Body Weight (Males Max 100Kg Females Max 70Kg)	Adjusted Body Weight (Ideal plus 40% excess)	Total Body Weight
<ul style="list-style-type: none"> Propofol induction Thiopentone Fentanyl and Alfentanil Morphine Non-depolarising NMBDs Paracetamol Local Anaesthetics 	<ul style="list-style-type: none"> Propofol Infusion Neostigmine (max 5mg) Sugammadex (read pack insert) Antibiotics 	<ul style="list-style-type: none"> Suxamethonium LMWHs (titrate dose with Xa levels)

Mirror NEWS • POLITICS SPORT • FOOTBALL CELEBS TV FILM MORE

News • UK News • Hospitals

Hospitals could ban commonly used anaesthetic for more eco-friendly version

Desflurane - one of the most commonly used gases to put patients asleep - has already been effectively "banned" at Raigmore Hospital in Inverness over climate change fear

By **Keith Perry** 20:11, 4 JAN 2020

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DAMENSEIN

ENIGMA2 Am Heart J. 2009 Mar;157(3):488-494

McKay RE et al BJA. 2010 Jan 19;104



Ventilation & Extubation



Pre-
Oxygenation ?

Pressure vs
Volume

PEEP

Recruitment

Avoid SV modes
Beware SGA

Nasal Airway

Failure Planning

Recovery

Reversal of NMB

- Monitor recovery of NM Block
- Quantative Assessment
- Neostigmine to 5mg
- Consider Sugammadex



11:07 SOBA Calc

Weight: 141 kg Height: 1.80 m Gender: Male

ANALGESICS

- Alfentanil** 406 to 812 mcg
LBW 5 - 10 mcg/kg
- Fentanyl** 81 to 812 mcg
LBW 1 - 10 mcg/kg
- Remifentanyl Infusion** Use AdjBW for TCI
- Morphine** 8 to 12 mg
LBW 0.1 - 0.15 mg/kg
- Bupivacaine** 150 mg
LBW 2 mg/kg, Max 150mg
- Lidocaine** 200 mg
LBW 3 mg/kg, Max 200mg
- Ropivacaine** 240 mg
LBW 3 mg/kg

LMWH - PROPHYLAXIS

- Tinzaparin** 4,500 units BD
TBW
- Dalteparin** 5,000 units BD
TBW
- Enoxaparin** 40 mg BD
TBW

ANTIBIOTICS - SURGICAL PROPHYLAXIS

11:07 SOBA Calc

Weight: 141 kg Height: 1.80 m Gender: Male

INDUCTION AGENTS

- Propofol Induction** 162 to 244 mg
LBW 2 - 3 mg/kg
- Propofol Infusion** Use AdjBW for TCI
- Thiopental** 244 to 500 mg
LBW 3- 7 mg/kg, Max 500mg

NEUROMUSCULAR BLOCKERS

- Atracurium** 49 mg
LBW 0.6 mg/kg
- Rocuronium** 49 to 97 mg
LBW 0.6 - 1.2 mg/kg
- Suxamethonium** 141 to 200 mg
TBW 1 - 1.5 mg/kg, Max 200mg
- Vecuronium** 8.1 mg
LBW 0.1 mg/kg

REVERSAL AGENTS


- Neostigmine** 5.0 mg
AdjBW 0.05 - 0.07 mg/kg, Max 5mg
- Sugammadex** 208 to 1668 mg
AdjBW 2 - 16 mg/kg

ANALGESICS

- Prop/Fent/Roc
- Ketamine
- High dose Paracetamol
- iv NSAIDs
- IPLA
- or iv Lidocaine / Mg
- Minimal opioids / OFA
- Dexmedetomidine avoiding PCA
- Tramadol
- Full reversal of NMB for fast recovery
- CPAP or HFNO in recovery

Eipe, N., S. Gupta, and J. Penning. "Intravenous lidocaine for acute pain: an evidence-based clinical update." *BJA Education* (2016): mkw008.

An 'OSA-safe' anaesthetic



Peri-op

- Avoid long-acting drugs
- Reduce Opioids/OFA?
- Sit up
- NIV
- Monitored
- ERAS and Mobilise/VTE
- Multimodal anti-emesis
- Non opioid adjuncts
- Oxygen post-op to SpO₂>94%
- Appropriate location



PRE-OP
RED FLAGS



RAMPED AIRWAY



LBW AND TITRATE



THEATRE
INDUCTION



REVERSE NMB



MINIMIZE
OPIOIDS



MOBILISE

Summary

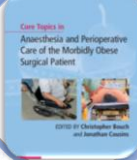


Resources

- Single Sheet Guide
- AAGBI/SOBA UK Guidelines
- Core Topic Textbook
- Obesity Theatre DVD
- ESPCOP
- SOBA

www.espcop.org

www.sobauk.com



The DVD

Filmed by Nick Kennedy and Abigail Hine in Taunton for all to process.

The filming was supported by Maquet and hosted by Vimeo



© 2015, 76, 459-476

doi:10.1111/anae.13111

Guidelines

Peri-operative management of the obese surgical patient 2015
Association of Anaesthetists of Great Britain and Ireland
Society for Obesity and Bariatric Anaesthesia

Members of the Working Party: C. E. Nightingale,¹ M. P. Margaron,¹ E. Shearer,¹ J. W. Redman,⁴ D. N. Lucas,¹ J. M. Cousins,¹ W. T. A. Fox,¹ N. J. Kennedy,¹ P. J. Venn,¹ M. Shires,¹ D. Gabbott,² M. Shires,¹ J. J. Pandit,³ M.T. Popat³ and R. Griffiths (Chair)³



KEY ISSUES IN ANAESTHESIA FOR THE MORBIDLY OBESE

The Fundamentals of Obesity & Bariatric Anaesthesia

Topics Include:

- Co-morbidities that Count
- The Peri-operative Perils
- Ventilation & Airway Management
- Sleep Apnoea & Avoiding Respiratory Arrests
- Tips & Tricks beyond 150kg



Scan for quick booking



Key Issues Course

Thursday 19th March 2020

Royal College of Surgeons, Edinburgh

Sponsored by 

www.sobaconference.com

Early Bird Rate

£100.00

until 28th February 20

£125.00 After

Online Booking Now Open

5 CPD POINTS PENDING

Scottish Airway Group Annual Meeting



Edinburgh, 20th March 2020

Programme includes:

- Awake Tracheal Intubation
- Intrathoracic pathology
- Laryngotracheal surgery
- Bariatrics

Speakers include:

- Dr Mark Steven, Glasgow
- Mr Andrew Kinshuck, Aintree
- Dr Karim El-Bogdady, London
- Dr Andrew McKechnie, Lewisham

When: Friday 20th March 2020

Where: Royal College of Physicians, Edinburgh

11 Queen Street, EH2 1JQ

Time: 09:15-17:15

Fee: £140 Consultants (£120 early bird)
£75 Trainees (£65 early bird)
£40 AHPs / students

Early Bird Rate available to 31st January

Abstracts: Details online

Closing date 31st January

Prizes for best poster and oral presentations

Online booking opening soon:
www.scottishairwaygroup.co.uk
5 CPD points



New Single Sheet

Anaesthesia for the Obese Patient

Society for Obesity and Bariatric Anaesthesia

Pre-operative Evaluation

Red Flags

- Poor functional capacity
- Abnormal ECG
- Uncontrolled BP, CCF or IHD
- SpO2 < 90% on air
- If brachystole > 27, OHS likely
- Previous DVT/PE
- STOP-BANG ≥ 5
- OSAHS ≥ 4
- Metabolic Syndrome
- High NSQIP ACS Risk

Consider:

- Preoperative CPAP
- Blood/Glucose / Sleep Studies
- Echocardiogram
- Cardiorespiratory referral
- Experienced Anaesthetist
- Book ICU bed

Yes

No

- May be suitable for day-case surgery

Central Obesity (waist > 102cm)

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

Peripheral Obesity (fat outside body cavity)

- Lower morbidity
- Lower risk

OS-MRS Calculator

tools.farmacologiaetia.info

NSQIP ACS Risk Calculator

riskcalculator.facs.org/RiskCalculator

STOPBANG Calculator


www.stopbang.ca

Intra-operative Management

Suggested Equipment

- Suitable bed/railery and operating table
- Gel padding
- Table extension/air boards
- Foamers roll or large BP cuff
- Device or equipment for rearing
- Strap for anaesthetist
- Difficult airway equipment
- Videolaryngoscope
- Ventilator capable of PEEP & pressure modes
- Flow warmer or equivalent
- Long spinal, regional and vascular needles
- Ultrasound machine
- Appropriately sized self-compression device
- Depth of anaesthesia monitoring
- Neurovascular monitoring
- Sufficient staff to move patient

Ramping



- Triage level with sternum
- Reduce risk of difficult laryngoscopy
- Improve ventilation and pre-oxygenation

Anaesthetic Technique

- Consider pre-ox and analgesia
- Careful glucose control
- DVT prophylaxis
- Self-position on operating table
- Preoxygenate and intubate in neutral sitting position
- Consider CPAP and HFNO
- Minimal induction to ventilation time
- Commence maintenance promptly
- Tracheal intubation recommended
- Caution with SAD in BMI > 40
- Avoid spontaneous ventilation, use PEEP
- Use short-acting rocuronium or TVA
- Short-acting opioids & multichannel analgesia
- PONV prophylaxis
- Ensure full NMB reversal
- Bulb and recover sitting up

Post-operative Care

ACS discharge:

- Usual discharge criteria should be met
- SpO2 should be maintained at pre-op levels with minimal O2 therapy
- No evidence of hypoventilation

OSA or Obesity Hypoventilation Syndrome:

- Sit up and avoid sedatives and pain-killers
- Reintroduce patient's own CPAP if applicable with additional time to recovery until free of apnoea without stimulation
- Patients unwell, intubated CPAP or non-invasively treated (pre-ox) 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

General good need level practice includes:

- Multisite analgesia
- Caution with long-acting opioids and sedatives
- Early mobilisation
- Robust thromboprophylaxis regime
- Experienced Consultant Follow-up

Questions?

Thank-you



Anaesthesia for morbid obesity

Jon Redman
SOBA Chairman
RCOA Updates
Nottingham 2020

RCOA
Royal College of Anaesthetists



SOBAUK
THE SOCIETY FOR OBESITY & BARIATRIC ANAESTHESIA



Declarations

- Current SOBA Chairman
- MSD Honorarium