

BARIATRIC ANAESTHESIA

(Anesthesia in Obese Patient)



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Two Worst enemy of Anesthetist







The
heaviest
person in
medical
history was
Jon Brower
Minnoch
(USA 1941–
83)
635 kg





Obesity: Definition

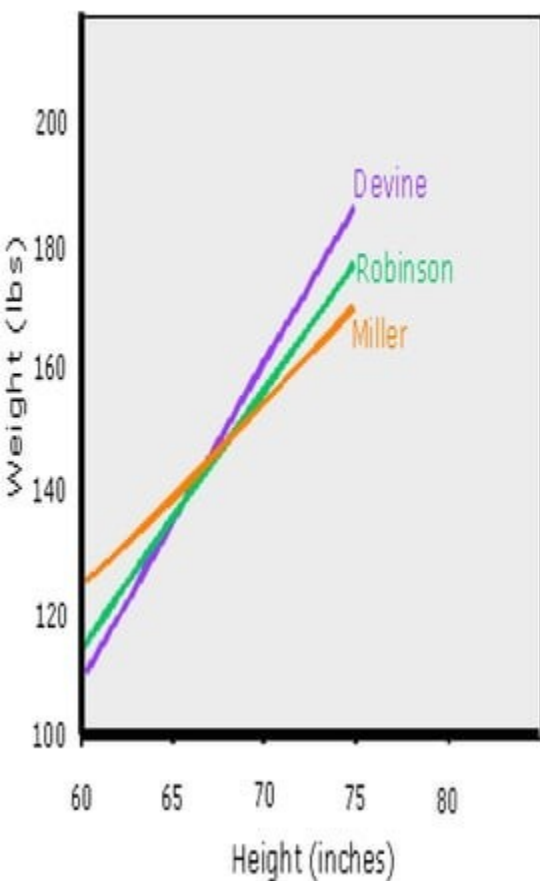
- A condition in which excess body fat may put a person at health risk. (laymen)
- A chronic metabolic disorder that is primarily induced and sustained by an over consumption or underutilization of caloric substrate (Medical)
- The American Heart Association (AHA) defines obesity as body weight 30 percent greater than the ideal body weight (Precise)

Equations

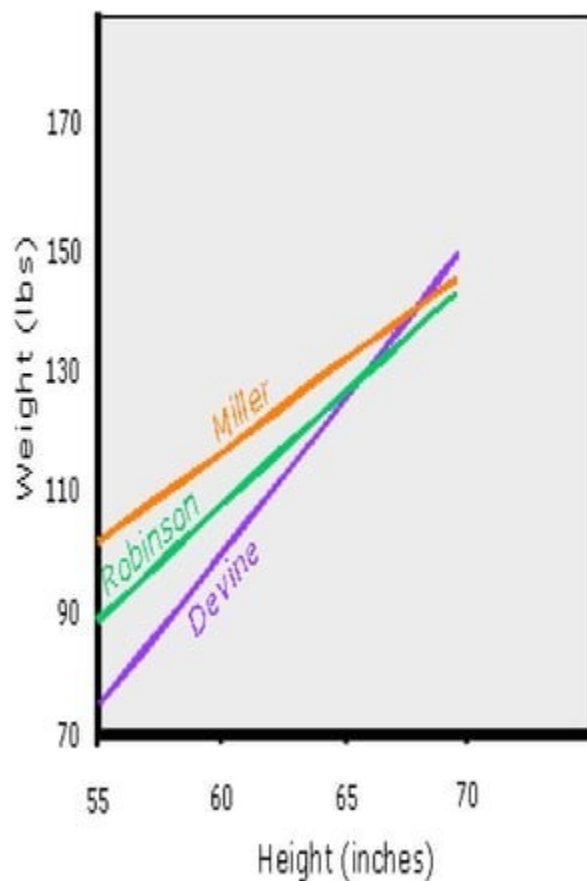
- Ideal body weight in Kg (IBW)
(Broca's Index)
 - Height in centimeters – 100 for men
 - Height in centimeters – 105 for women

— -----
- Body mass index (BMI)
 - weight in Kg / Height (m) ²

IBW formulas for Men



IBW formulas for Women



WHO Definitions

Obese

20% > IBW

BMI > 28 – 35

Morbidly Obese

> 2 x IBW

BMI > 35



Obesity Classification

Overweight - BMI > 25 kg/m²

Obesity - BMI > 30 kg/m²

Morbid Obesity - BMI > 40 kg/m² or
35 with coexisting co morbidities

Super Obese Patient - BMI > 50
kg/m²

My own BMI

- My weight is 80 kg
- My height is 5'8" (170 cm or 1.7 meter)
- So my BMI $80 / (1.7)^2$ is 27.68
- So I am Overweight but not obese

Obesity-- Disease –Death Risk

<u>BMI(kg / m2)</u>	<u>Class</u>	<u>Hazard Ratio for All Cause Death</u>	<u>Disease Risk</u>
18.5 – 24.9	Normal	1 %	---
25 – 29.9	Overweight	1.16 %	Increased
30 – 34.9	Obesity I	1.25 %	High
35 – 39.9	Obesity II	2.96 %	Very High
> 40	Obesity III	2.96 %	Extremely High

Height (ft/in)	5'0"	5'2"	5'4"	5'6"	5'8"	5'10"	6'0"	6'2"	6'4"	6'6"
Height (in)	60	62	64	66	68	70	72	74	76	78
BMI (kg/m2)										
150	29.4	27.5	25.8	24.3	22.9	21.6	20.4	19.3	18.3	17.4
160	31.3	29.3	27.5	25.9	24.4	23.0	21.7	20.6	19.5	18.5
170	33.3	31.2	29.2	27.5	25.9	24.4	23.1	21.9	20.7	19.7
180	35.2	33.0	31.0	29.1	27.4	25.9	24.5	23.2	22.0	20.8
190	37.2	34.8	32.7	30.7	28.9	27.3	25.8	24.4	23.2	22.0
200	39.1	36.7	34.4	32.3	30.5	28.8	27.2	25.7	24.4	23.2
210	41.1	38.5	36.1	34.0	32.0	30.2	28.5	27.0	25.6	24.3
220	43.1	40.3	37.8	35.6	33.5	31.6	29.9	28.3	26.8	25.5
230	45.0	42.2	39.6	37.2	35.0	33.1	31.3	29.6	28.1	26.6
240	47.0	44.0	41.3	38.8	36.6	34.5	32.6	30.9	29.3	27.8
250	48.9	45.8	43.0	40.4	38.1	35.9	34.0	32.2	30.5	29.0
260	50.9	47.7	44.7	42.1	39.6	37.4	35.3	33.5	31.7	30.1
270	52.8	49.5	46.4	43.7	41.1	38.8	36.7	34.7	32.9	31.3
280	54.8	51.3	48.2	45.3	42.7	40.3	38.1	36.0	34.2	32.4
290	56.8	53.2	49.9	46.9	44.2	41.7	39.4	37.3	35.4	33.6
300	58.7	55.0	51.6	48.5	45.7	43.1	40.8	38.6	36.6	34.7
310	60.7	56.8	53.3	50.1	47.2	44.6	42.1	39.9	37.8	35.9
320	62.6	58.7	55.0	51.8	48.8	46.0	43.5	41.2	39.0	37.1
330	64.6	60.5	56.8	53.4	50.3	47.4	44.8	42.5	40.3	38.2
340	66.5	62.3	58.5	55.0	51.8	48.9	46.2	43.7	41.5	39.4
350	68.5	64.1	60.2	56.6	53.3	50.3	47.6	45.0	42.7	40.5
360	70.5	66.0	61.9	58.2	54.9	51.8	48.9	46.3	43.9	41.7
370	72.4	67.8	63.6	59.8	56.4	53.2	50.3	47.6	45.1	42.8
380	74.4	69.6	65.4	61.5	57.9	54.6	51.6	48.9	46.4	44.0
390	76.3	71.5	67.1	63.1	59.4	56.1	53.0	50.2	47.6	45.2
400	78.3	73.3	68.8	64.7	60.9	57.5	54.4	51.5	48.8	46.3
410	80.2	75.1	70.5	66.3	62.5	59.0	55.7	52.8	50.0	47.5

Overweight

Obese

Morbidly
Obese

Incidence of Obesity

- **23 %** are obese of world population
- **5%** are morbidly obese
- Mortality is **2.96** times higher in obese

Twenty Years of Increasing Obesity



Source NCHS -- JAMA 2002;14:1723-27.

Causes of Obesity

- Genetic predisposition
- Socialization
- Age
- Sex
- Race
- Economic status
- Psychological (Dietary Habits)
- Cultural
- Emotional
- Environmental factors
- Cessation of smoking



Diseases Linked to Obesity

- Diabetes
- Coronary Heart Disease
- High Blood Pressure
- Stroke
- Arthritis
- Gastroesophageal reflux
- Cancer
- High cholesterol
- Endocrine disease



Diseases Linked to Obesity

- Hypertrophic Cardiomyopathy
- Infertility
- Depression
- Obstructive sleep apnea
- Gallstones
- Fatty liver
- Stress incontinence
- Venous ulcers
- End-stage kidney failure
- Sudden death



Hypertension is about **6 times** more frequent in obese subjects than in lean men and women

A 10-kg higher body weight is associated with a 3.0-mm Hg higher systolic and a 2.3-mm Hg higher diastolic blood pressure. These increases translate into an estimated 12% increased risk for **CHD** and 24% increased risk for **stroke**

Physical Complications of Obesity

- Heart disease
- Type II diabetes mellitus
- Hypertension
- Stroke
- Cancer (endometrial, breast, prostate, colon)
- Gallbladder disease
- Sleep apnea
- Osteoarthritis
- Reduced fertility
- increased risk of morbidity and mortality as well as reduced life expectancy
- Psychological & Sexual

Psychological Complications of Obesity

- Emotional distress
- Discrimination
- Social stigmatization
- Anxiety, fear, hostility and insecurity



Diabetes Mellitus Type 2 prevalence is 2.9 times higher in the obese than in non-obese for those 20-75 years of age.



Morbidity due to Cardio-vascular diseases has been reported to be almost 90 % in those with severe obesity.



For
Anaesthesiologist
Concerned

Changes in Body system due to Obesity

- Cardiovascular Physiology
- Respiratory Physiology
- Gastro Physiology

Cardiovascular Pathophysiology in Obesity

- **Excess body mass leads**

↑ metabolic demand → ↑ Cardiac Output

For every 13.5 kg of fat gained:

- 25 miles of neovascularization occurs
- Increased CO of 0.1 L/min for each kg of fat.

↑ workload

- **LVH**

∇↑ Pulmonary blood flow

– Pulmonary HTN → Cor Pulmonale → Right Heart Failure

∇ ↑ SV and SW Proportion to body weight

LVH dilatation

Cardiovascular Pathophysiology

- --↑ Risk of arrhythmias
 - Hypertrophy of Myocardium
 - Hypoxemia
 - Fatty infiltration of cardiac conduction system
 - ↑ Catecholamines
 - Sleep apnea
 - Dyslipidemia
 - Glucose intolerance

Cardiac Evaluation: in obese patient

Ask for

- Prior MI (Myocardial Ischemia / Infraction)
- HTN (Hypertension)
- Angina
- PVD (Peripheral Vascular Disease)
- Limitations in exercise tolerance
- History of orthopnea
- Paroxysmal nocturnal dyspnea

In ECG look for

- Resting rate
- Rhythm
- Ventricular hypertrophy or strain
- Ischemic changes or evidence of Coronary Artery Disease
- Low voltage ECG
- Axis deviation and atrial tachyarrhythmias
- LVH
- Ventricular ectopy

ECG Changes That May Occur in Obese Individuals

↑ Heart rate

↑ PR interval

↑ QRS interval

↑ or ↓ QRS voltage

↑ QT_c interval

↑ QT dispersion

T Inversion

ST-T abnormalities

ST depression

Left-axis deviation

Flattening of the T wave (inferolateral leads)

Left atrial abnormalities

False-positive criteria for inferior myocardial infarction

Vascular Access in obese

Very Challenging

- Excessive fat obscures blood vessels
- Always put IV cannula (No Scalp Veins)
- Central line placement, if indicated

Volume Replacement in Obese

- Adult total body water percentage is **70 %** in normal individual

But

- Severely obese has total body water is **40%**.

And

- In obese patient estimated blood volume is **50 ml / kg**, then **70 ml / kg** in non-obese

So,

**Obese patient less tolerate
fluid & blood loss during surgery**

Volume Replacement

- **Avoid rapid rehydration, to**
 - **Lessen cardiopulmonary compromise.**
- **Administer Hetastarch at recommended volumes per kilogram of IBW**
 - **20 mL/kg**
- **Albumin 5% and 25% used as indicated**
 - **To Support circulatory volume and oncotic pressure.**
- **Replace blood loss with crystalloid**
 - **3:1 ratio**

Respiratory Pathophysiology in Obesity

There is a clear association between dyspnea and obesity. Obesity increases the work of breathing because of the reductions in both chest wall compliance and respiratory muscle strength

- Excess metabolically active adipose tissue **plus**
 - ↑ workload on supportive respiratory muscle
 - ↑ CO₂ production
 - Hypercarbia**
 - ↑ O₂ consumption
 - Hypoxia**

Respiratory Pathophysiology in Obesity

Obese patient shows

- **Restrictive lung disease Pattern**
 - Decreased chest wall compliance
 - Diaphragm forced upwards
 - Decreased lung volumes
 - Lung volumes decreased by supine and Trendelenberg positions
 - FRC may fall below closing capacity
 - Ventilation / Perfusion mismatch

Changes in Pulmonary Volumes and Function Tests

- Tidal volume (TV)
 - Normal or Decreased
- Inspiratory reserve volume (IRV)
 - Decreased
- Expiratory reserve volume (ERV)
 - Greatly Decreased

Changes in Pulmonary Volumes and Function Tests

- FRC
 - Greatly decreased
 - Direct inverse relationship between BMI and FRC
- FEV₁
 - Normal or slightly decreased

Respiratory Pathophysiology

Severe Obese patients are

- Relatively Hypoxemic & Occasionally Hypercapnic showing

Obesity-hypoventilation Syndrome

(Pickwickian syndrome)

- Obesity usually extreme
- Hypercapnia
- Cyanotic / hypoxemia
- Polycythemia
- Pulmonary HTN
- Biventricular failure
- Somnolence
- Obstructive Sleep Apnea Syndrome (OSAS)

OSAS

- Definition
 - 10 seconds or more of total cessation of airflow despite respiratory efforts
- Clinically Relevant
 - 5 episodes per hour or 30 episodes per night

OSAS (clinical)

- Snoring
- Dry mouth and short arousal during sleep
- Partners report apnea pauses during sleep

OSAS

- More vulnerable to airway obstruction
 - Opioids
 - Sedatives
- More vulnerable in supine or Trendelenberg position

Diagnostics Criteria for OSAS

Nocturnal Poly-somnography positive

Body Mass Index is more than 30 kg /m²

Daytime PaCo₂ is more than 45 mm of Hg

Absence of other known cause of Hypoventilation

Respiratory Evaluation in Obese Patient

Ask & Look for,

- Dyspnea, snoring, Chest pain
- Sleep apnea & comfortable sleeping position
- X-Ray Chest
- Respiratory Rate & Breath Holding time
- Pulmonary Function Test
- Spo2 & EtCo2

GI Pathophysiology

∇ ↑ incidence

- Gastroesophageal reflux
- Hiatal hernia
- ↑ abdominal pressure

- Severe **risk** of Aspiration

GI Pathophysiology

- **After 8 hour Fast**
 - 85 – 90% of morbidly obese patients have
 - Gastric volumes > 25 ml
 - Gastric pH < 2.5

Anesthetic Considerations

↑ risk for aspiration pneumonitis if reflux history or Acid-Peptic Disease present

- Consider H_2 antagonist (pre, intra and post)
- Metoclopramide, Ranitidine or Ondansetron

Over all Assess for

- Cardio-Pulmonary reserve
- ECG & X-Ray Chest, if necessary Echocardiography
- LFT & RFT
- ABG
- PFT
- Medication for any Disease

Position

- Proper positioning can be difficult
- May need extra support under back in Supine
- **POSITION, POSITION, POSITION**

Preoperative Airway Assessment **for Intubation**

15% of obese patients are a difficult intubation

Short thick neck

Obesity and short thick neck Related to OSAS
and to each other

Fat in lateral pharyngeal walls are difficult to
exam in awake patient

Preoperative Airway Assessment for Intubation

- Limited TM joint mobility
- Limited atlanto-occipital mobility
- Narrow upper airway
- Small space between mandible and sternal fat pads
- See for mallampati classification
- Neck Circumference

Best Position for Intubation

External auditory meatus and sternal notch
at same level



Mallampati Classification

Class I = visualization of the soft palate, fauces, uvula, anterior and posterior pillars.

Class II = visualization of the soft palate, fauces and uvula.

Class III = visualization of the soft palate and the base of the uvula.

Class IV = soft palate is not visible at all.



Class I



Class II



Class III



Class IV

Neck Circumference

- Normal neck circumference is $\text{weight in kg} / 2$ in cm
- Normal neck cir. at 70 kg is 35 cm
- If it increase by 13 % then difficult intubation is counted

Anesthetic Considerations: Preoperative

- BP with appropriate size cuff
if arm is too fatty then forearm or leg
- Plan / examine for Venous / Arterial access
- Preferred to take two secured IV lines

Anesthetic Considerations: Preoperative

- If HTN – Pre-op good control
- If DM – well controlled
- H/o chest pain then ECG &/or Stress Echo
- Previous anesthesia exposure and any problem to ask
- If any other related disease then medical advice

Before giving Anaesthesia always keep in mind

- Assistant is always required
- Difficult Mask ventilation & Intubation
- Changes in Cardio-Respiratory System
- High risk of oesophageal reflux (GERD)
- High risk of aspiration
- Rapid sequence intubation with
 - pre-oxygenation
 - cricoid pressure
 - Succinylcholine
 - Proper position of Obese patient

Induction Airway Equipment

- Light Stylet
- Gum elastic bougie
- Oral airway
- LMA's
- ETT with stylet



Anesthetic Considerations: For Induction

- Consider awake intubation first or
- Awake fiber optic intubation if difficult airway suspected
 - Avoids airway collapse
 - Minimal to no sedation
 - LMA is good alternative for temporary mechanical ventilation in grossly and morbid obese patient
 - High FIO₂
 - For Breath sounds ETCO₂ important
 - Consider tracheotomy kit and surgeon stand by

VENTILATION

- In morbidly obese patients, the best strategy for ventilation is to deliver TV according to IBW (**10 -12 ml / kg**)
- Apply **5 cm H2O PEEP** in order to decrease the incidence of atelectasis.
- Minute ventilation and ETCO2 need to be monitored closely
- Usually use **pressure control ventilation**

Obesity: Pharmacology

Overdosing of pre medication and anesthesia drugs in obese patient is very common

- Doses should be calculated on predicted “lean body weight”
- **Lean body weight** = body weight - fat weight
- Avoid IM injection due to unpredictable absorption
- If possible, avoid narcotics and sedation in obese patient

Obesity: Pharmacology

- Propofol at **TBW**
- **Thiopental** at **IBW**
- **Midazolam** at **IBW**
- Scolene at **TBW**
- **Vcuronium** at **IBW**
- Atracurium at **TBW**
- **Rocuronium** at **IBW**
- Fentanyl & Sufentanyl
at **TBW**
- **Remifentanil** at **IBW**



Anesthetic Considerations: Intraoperative

- **Positioning**
 - 2 OR tables side by side
 - If weight is > 350 lbs (150 kg)
 - Prone position is poorly tolerated
 - Lateral decubitus is keeps abdominal weight off chest
 - Morbidly obese patient should never lie flat
 - Semi-Fowler's position
 - Upper body elevated 30 – 40°
 - Reverse Trendelenburg Position
- Best position during post-operative period

Reverse Trendelenburg Position

- RTP is best intraoperative position
 - Can ameliorate deleterious effects of supine position
- RTP is 30 degree head up position
- RTP
 - ↑ pulmonary compliance
 - ↑ FRC
 - Returned $P(A-a)O_2$ to baseline
- RTP may be a better solution than
 - Large TV and PEEP

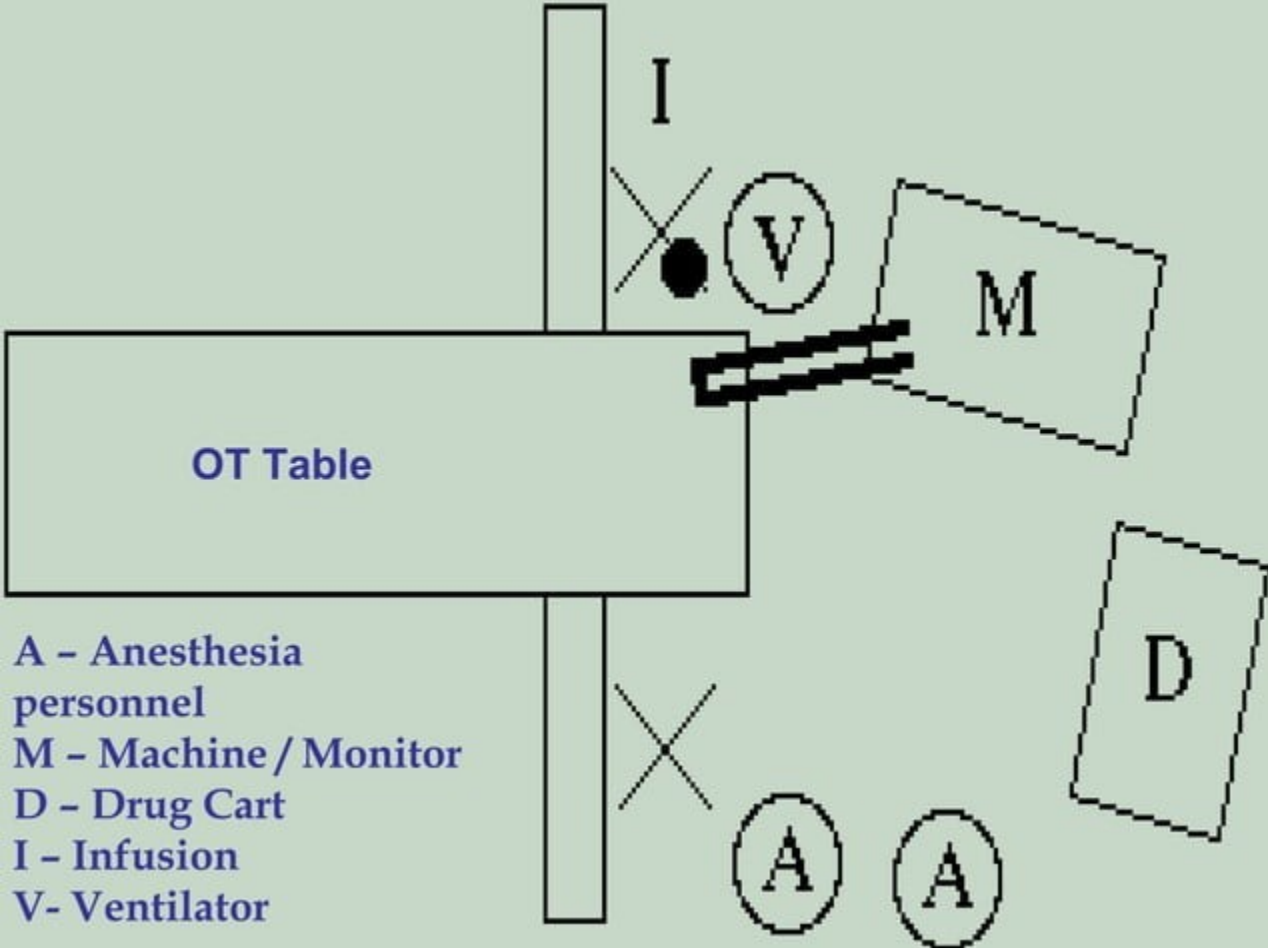
For MF2184, MF2184 (A)
MF2184 (B), MF2187



Reverse Trendelenburg Position

Monitoring

- ECG
- Pulse Oxymeter
- Blood pressure
- Temperature
- Inspired oxygen concentration
- Capnography
- Arterial catheter to continuously measure BP and blood gases (if medically indicated)
- CVP catheter
- Urinary catheter
- Advance monitoring according to Surgery
- If indicated then BIS (BI-Spectral Index)



Goals for Maintenance of Anesthesia

- Strict maintenance of airway
- Adequate skeletal muscle relaxation
- Optimum oxygenation
- Maintenance of anesthesia with inhalation and intravenous agents
- Avoid residual effects of muscle relaxants
- Appropriate intraoperative and postoperative tidal volume
- Effective postoperative analgesia.

Anesthetic Considerations: Postoperative

- Respiratory failure risk increased by
 - Preoperative hypoxia
 - Thoracic or upper abdominal surgery
 - Vertical incision
 - Delayed extubation
 - In complete reversal of muscle relaxation
 - Co existing disease
 - Un attention of patient
 - Narcotics and Sedation

Anesthetic Considerations: Postoperative

Strictly Followed

- Supplemental O₂ after extubation till
Transport from OR to Recovery room & then after
- 45 degree head up position
 - Unload diaphragm
 - Improves oxygenation
 - Improves ventilation
 - CPAP and BiPAP should available

Always keep in mind

- Increased mortality because of post op Hypoxia
 - 6.6% vs. 2.7% in non-obese
- Absolute no sedation post op
- Strict Antibiotic &/or Heparin regime Pre & Post for
 - Wound infection
 - DVT (Deep Vein Thrombosis)
 - PE (Pulmonary Embolism)

Postoperative Pain Relief

- PCA (Patient Controlled Analgesia)
 - Can provide good pain relief
 - Dose based on IBW
- NSAIDs, Local anesthetic infiltration
- Epidural route is preferred for
 - Administration of smaller dose than IV route

Obesity & Regional Anesthesia

- Regional anesthesia
 - Technically more difficult, Long spinal needle required
 - Require **20 – 25% less Local Anesthetic Drugs** for Spinal or Epidural anesthesia because of
 - (Epidural fat and distended epidural veins)
- Combined Epidural / General (GA) preferred to decrease GA requirement
- Epidural anesthesia ↓ postoperative respiratory complications

Airway Management of the Obese (ASA Guidelines)

- Formulate an airway management plan
- Facial anatomy needs appropriate mask selection
- Increased mass of soft tissues and Macroglossia
- Weight of head
- Head Tilt & "Sniffing Position" may require building up towels or blankets under the back, scapulae, and shoulders, as well as the head and neck
- beware of *"can't ventilate, can't intubate"* situations!
- Mask ventilation may require two persons: one to use two-handed mask technique with triple airway maneuver, airway device, and CPAP; with another to bag the patient and monitor effectiveness
- appropriately sized oropharyngeal or nasopharyngeal airway
- "Bull Neck" – short, thick neck inhibits mobility and makes visualization of the larynx difficult during laryngoscopy.
- Have "rescue" alternative airway devices ready to hand: e.g., Laryngeal Mask Airway (LMA) or Intubating LMA (Fastrach™); Elastic Gum Bougie; Lighted Stylet; Esophageal Combi-Tube™; Fiber-optic Laryngoscope or Bronchoscope

Airway Management of the Obese (ASA Guidelines)

- The first intubation attempt should be by the most experienced intubator
- If the first best attempt determines difficult or impossible laryngoscopy or intubation, change to either Rescue Airway plan (if patient condition is critical), or *early* Fiberoptic Intubation before airway trauma worsens the situation
- Large breasts may get in the way of the laryngoscope handle (half-size handles are available).
- Response to induction agents is less predictable for intubation
- Confirmation of endotracheal intubation should be by three or more methods including either capnometry or capnography
- Obese patients *will desaturate oxygen rapidly*
- All obese patients with airway problems or impending intubation should have 100% oxygen
- In failed Intubation by all methods, in emergency Percutaneous cricothyrotomy or surgical tracheostomy

CONCLUSION

A pre-anesthesia evaluation

- By an anesthesia clinician at least 1 day before
- When possible, within 1 month of scheduled surgery

Minimum labs:

- Hematocrit
- Glucose
- Creatinine and Blood urea

Extended preoperative testing

- As indicated by co morbidities
- According to the American Society of Anesthesiologists (ASA)

Standard clinical preoperative assessment

- For sleep apnea of every obese surgical patient-
- Polysomnography in selected patients.

Smoking cessation

-At least 6 weeks before surgery,

Standard use of the 30° Reverse Trendelenburg (head up) position

-During preoxygenation, induction, and emergence from anesthesia.

Induction techniques

to facilitate expeditious tracheal intubation, which may include a "rapid sequence induction."

Immediate availability of difficult airway management devices

- Fiber-Optic laryngoscope
- Laryngeal mask airway

An additional anesthesia clinician

- The good OT assistant and the Surgeon during induction and emergence.

Prior to extubation

- The patient should be fully awake
- Complete reversal of neuromuscular

Tailoring of the anesthetic

- Drugs to promote early return of the patient's protective airway reflexes & Maintenance of oxygenation.

Maintaining euvoolemia

-Monitoring body temperature, and fluid therapy

The use of alternate sites for noninvasive BP assessment

- the forearm or leg if needed

-invasive hemodynamic monitoring as medically indicated.

For Medications

-Begin dosing closer to the patient's estimated lean body mass, TWB and IBW

Use of ASA Standards for Postoperative Care

Taking the implications of a diagnosis of sleep apnea into consideration

-As well as the patient's overall medical condition.

Availability of CPAP/BiPAP,

-As needed, postoperatively for noninvasive positive pressure ventilation.

Post Operative good pain relief

-A combination of local anesthetics with opioids, Nsaids and possibly epinephrine in the epidural solution

Effective and unimpaired

-Intraoperative and perioperative communication among the anesthesia, nursing, and surgical members.

Identification of an anesthesiologist

-With a special interest in anesthetic care and pain management for obese surgical patients

Availability of at least

-One portable storage unit with specialized equipment for management of difficult airways throughout the perioperative period, maintained and operated by clinicians.

Availability of a Clinician

-With airway management skills perioperatively.

Formulation of, and adherence to, institutional protocols

-Of continued close monitoring of patients with documented or suspected complications for perioperative care of patients

Case study of female obese patient posted for Umbilical Hernia Repair

- 55 year old female
- Height 5'2" (1.55 meter)
- Weight 114 kg
- BMI 47.5
- ASA Physical Status II
- BP 142/82 mm hg & Resting pulse 82 / mn
- Spo2 at room air 93 %
- Mild asthma
- EF > 50
- No other positive personal, past or family history
- ECG and X-ray chest were normal
- Lab investigations WNL
- Negative history of GERD, snoring and obstructive sleep apnea
- ASA III

On Examination

- Very obese patient
- Very short neck
- Mallampati class II airway
- Patient was needing two pillows in supine
- Two anesthetist were there
- Two IV line taken with 20 # veinflon
- Neck circumference 68 cm

Preparation

- Pre oxygenation started with 5 liter through nasal prongs
- Multi parameter (NK) put including Spo2, ECG, Large BP cuff (NIBP), Temperature probe
- Patient put supine 30 degree RTP position with 2 pillows under head
- One nebulizer puff of bronchodilator given

Premedication

- Glycopyrolate 1 ml IV
- Rantac 2 ml IV
- Emeset 4 ml
- Lyceft 2 gm IV
- Fentanyl 100 mcg IV
- Midazolam 2 mg IV
- Voveran 3ml IV
diluted
- Xylocard 5 ml IV



INDUCTION

- Propofol 1.5 mg / kg IV slowly with total 17 ml given
- Immediately put large size oro pharyngeal airway
- Cricoid pressure applied
- Spontaneous ventilation maintained and assisted prior to intubation

Intubation

- Cricoid pressure applied
- Scolene 150 mg given fast IV
- Laryngoscopy and Intubation with 7 # cuff ET with stylet were performed uneventfully
- Cuff pressure 7 ml applied with air
- Not much threatening changes were noted on multi Para monitor

Maintenance

- Patient put on max ventilator with TV 900 ml (8 ml/kg) and RR 16 / min
- Capnography put between ET and Ventilator
- Atracurium 50 mg IV bolus
- Oxygen 3 lit and Nitrous Oxide 3 lit with Isoflurane 2 mark Continuously given
- Atracurium repeated 15 mg around every 30 minutes
- No adverse cardiac or respiratory events occurred
- Total 1500 ml RL given intra operative

At the end

- Nitrous Oxide and Isoflurane discontinued and Oxygen 100 % around 5 lit continued
- Neuromuscular blockade reversed with neostigmine 5 mg IV and Glycopyrrolate 1 mg IV
- Mechanical ventilation discontinued upon resumption of spontaneous ventilation

Recovery

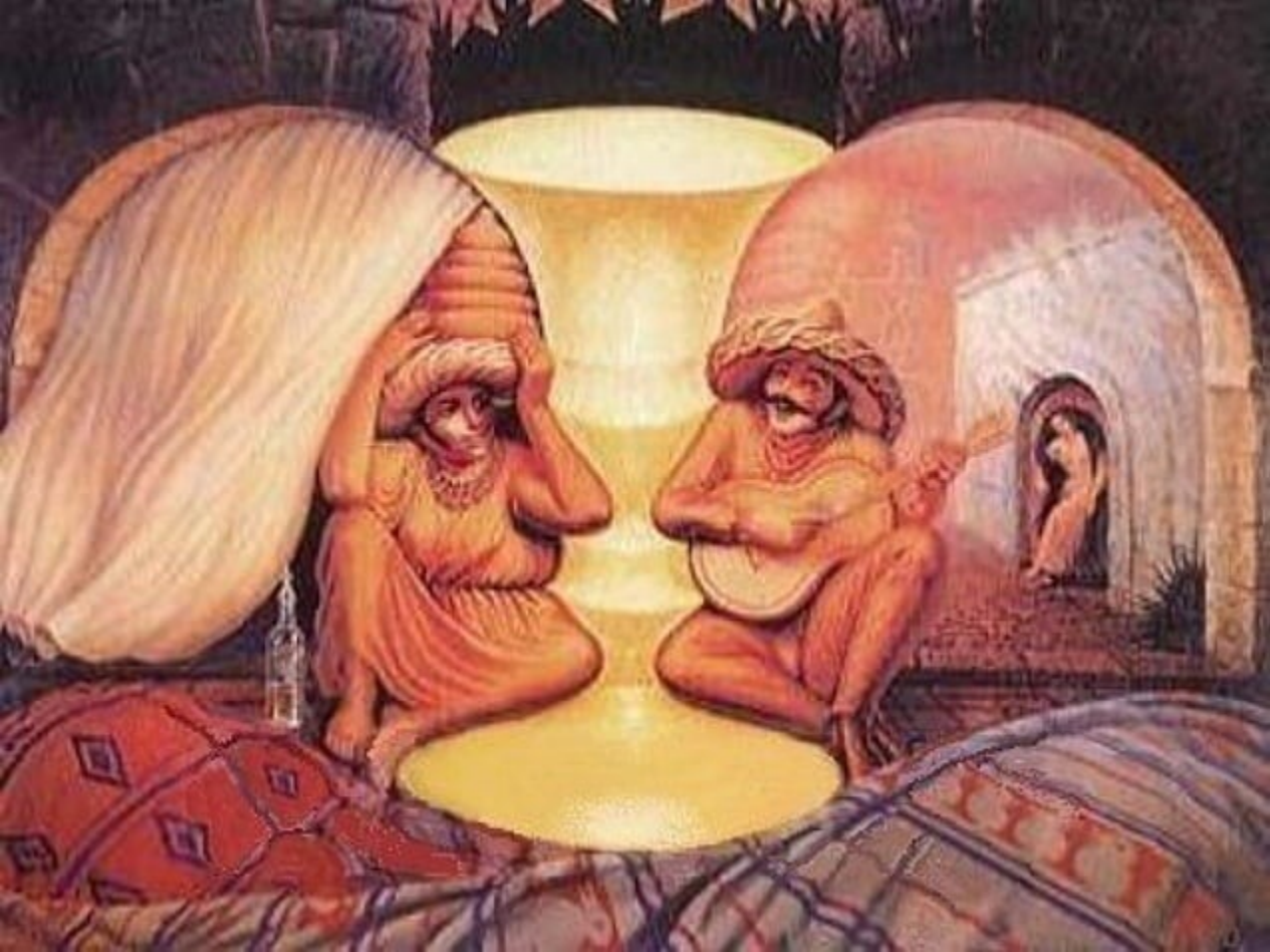
- Patient opened eyes and responded to command approximately 5 minutes after reversal. No coughing or breath holding noted
- Spontaneous ventilation, with sustained head lift and oxygen saturation maintained $> 95\%$
- Extubation performed uneventfully
- Patient transferred to recovery ward in left lateral position with oxygen 3 lit via nasal route
- Total surgical time was 1 hour 25 minutes and total anesthesia time was 1 hour 40 minutes

Transfer

- Patient put 30 degree head up in recovery room
- Patient transferred from recovery to special room after 6 hours
- No major or life threatening changes in vitals noted in post op period
- Patient discharged after 8 days

Message

- The anesthetic management of the clinically severe obese patient requires meticulous preoperative, perioperative and postoperative care.
- Careful planning is essential before taking the patient in the operating room.
- To have excellent outcome, a multidisciplinary approach, including the primary care physician, anesthesiologist, surgeon, nursing staff and social worker is necessary.







Dear Staff:

Due to the projected increase workload in the coming months, the management has decided that it can no longer afford for you to take time out of your busy schedule and go to the restroom. Instead, to increase employee efficiency the company will shoulder the expense of remodeling your cubicle to accommodate restroom privileges. Thank you for your cooperation.
Management

A 3D rendered orange mug with a matching handle, positioned on a reflective surface. The mug features the text "Coffee Break" in a serif font. The background is a soft, hazy sunset or sunrise sky with a gradient from light blue to orange, and a dark, reflective ground plane shows a subtle reflection of the mug.

Coffee
Break

Thank You

