

Morbid Obesity

Definitions

- Obesity - abnormally high percentage of body weight as fat
- Overweight - increased body weight above a standard related to height
- Android - central adipose tissue on upper body
- Gynecoid - peripheral adipose tissue on hips, buttocks, thighs

BMI

- **BMI** = body weight (kg) / height² (m)
 - Obesity > 30
 - Morbid Obesity > 40
 - Super Morbid Obesity > 55

Pulmonology

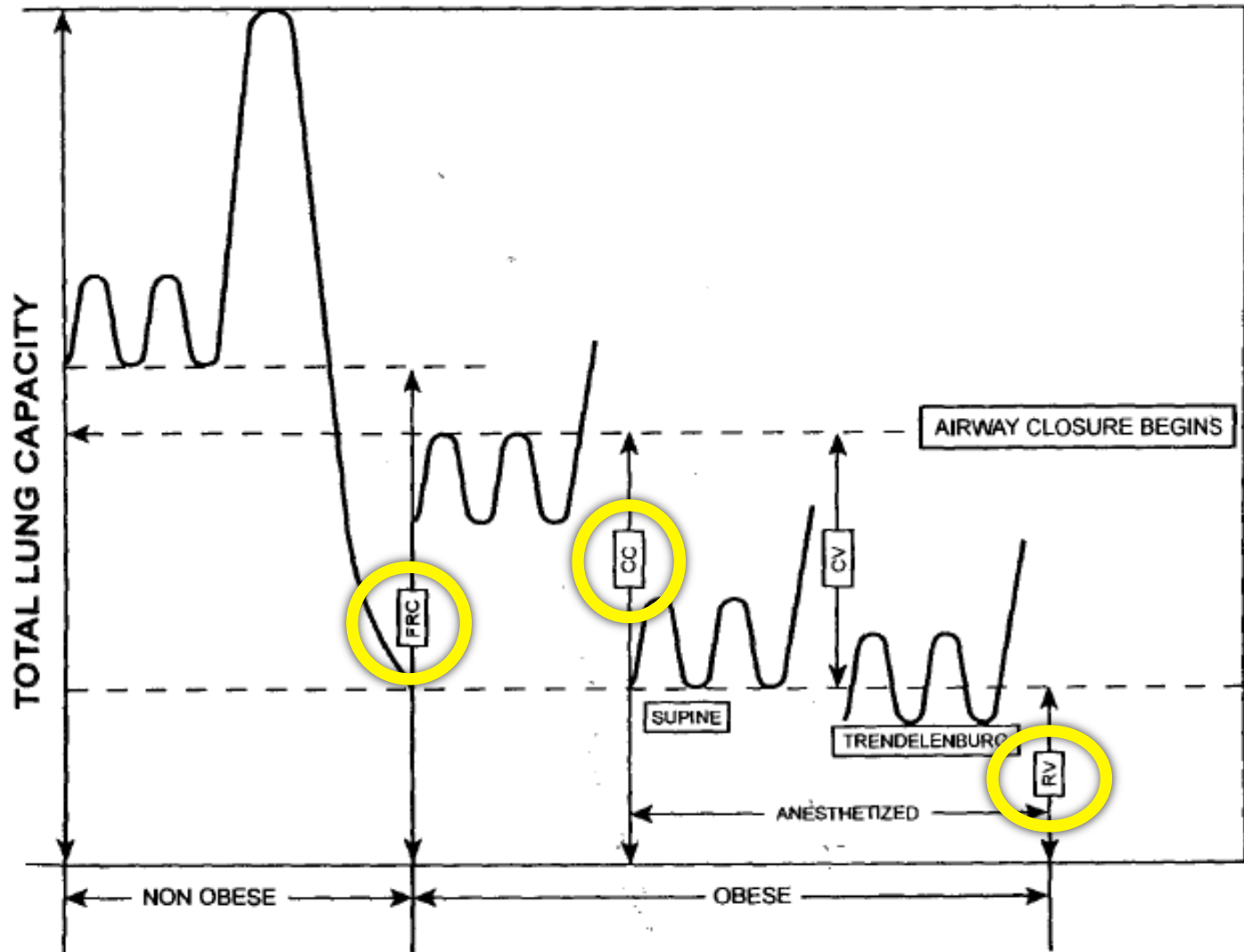
Decreased

1. Pulmonary Compliance
2. FRC
3. Vital Capacity
4. TLC
5. Residual Volume

Increased

1. Closing Capacity
2. O₂ Consumption
3. CO₂ Production
4. V/Q Mismatch

Ventilation



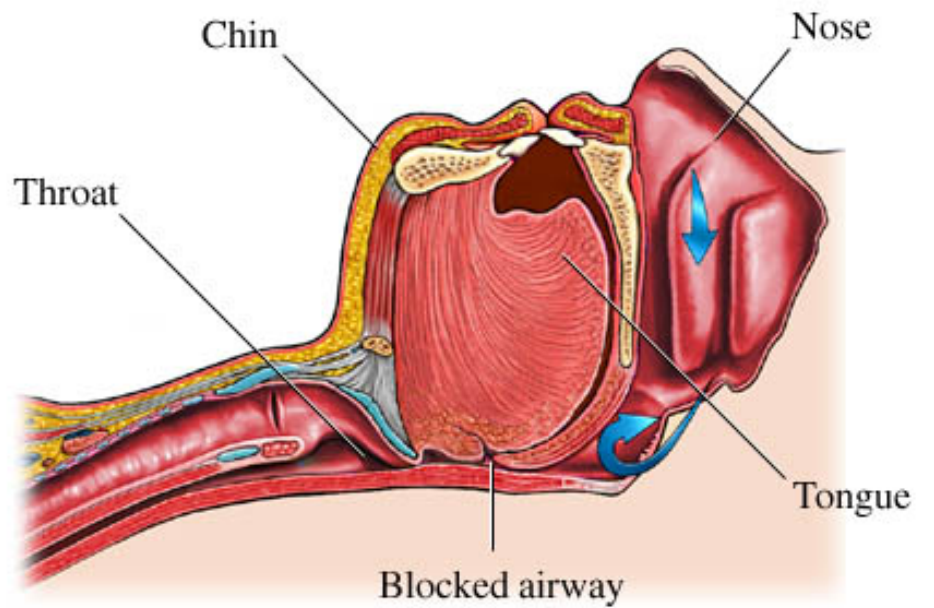
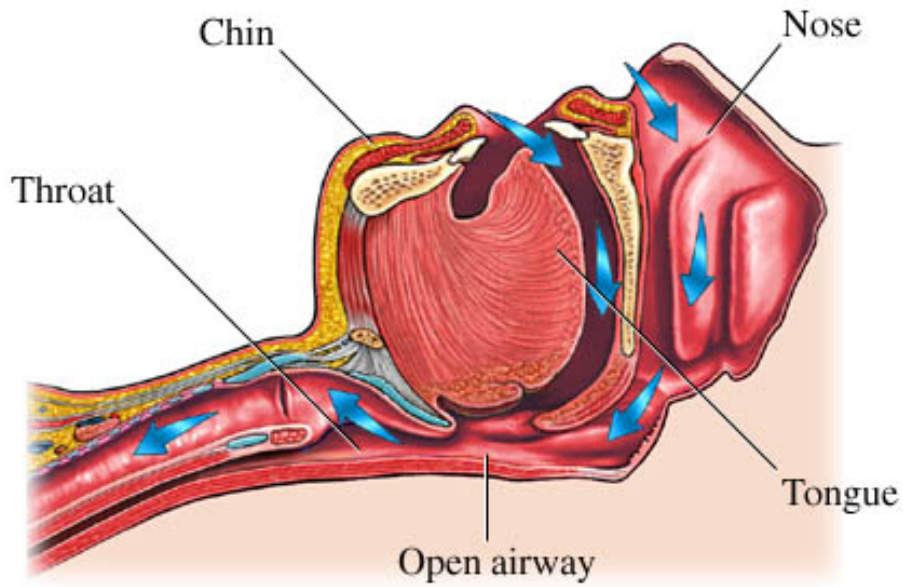
Obstructive Sleep Apnea

- 5% of obese individuals
- Physiologic abnormalities:
 - hypoxemia
 - hypercapnea
 - pulmonary & systemic vasoconstriction
 - polycythemia
- Increased risk for MI & CVA

Long term risk of Pickwickian Syndrome

-Aka: Obesity Hypoventilation Syndrome

1. Altered control of breathing (Central Apnea)
2. Hypoxic drive ventilation
3. Intrinsic lung disease
4. Right ventricular failure



Airway Issues

1. Limited atlanto-axial & cervical spine movement
2. Excessive pharyngeal / subpharyngeal tissue
3. Thick submental adipose deposition
4. Poor oral opening
5. Large tongue & epiglottis

Airway Evaluation

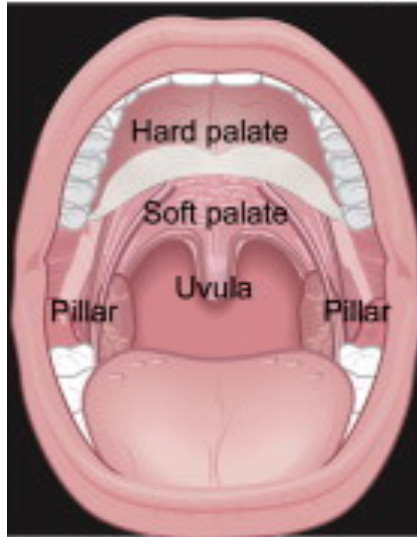
- Standard Exam: Mallampai, cervical spine mobility, Teeth, Thyromental distance
- STOP-BANG:
 - Snore
 - Tired
 - Observed obstructing
 - HTN
 - BMI>35
 - Age >50
 - Neck circumference >40 cm
 - Male
- Previous Intubations: review history

Neck Circumference

Single largest predictor of difficult intubation

- 5% with 40 cm neck (15.75 inches)
- 35% with 60 cm neck (23.6 inches)
- Associated factors: male, higher Mallampati, grade 3 views with laryngoscopy, and OSA

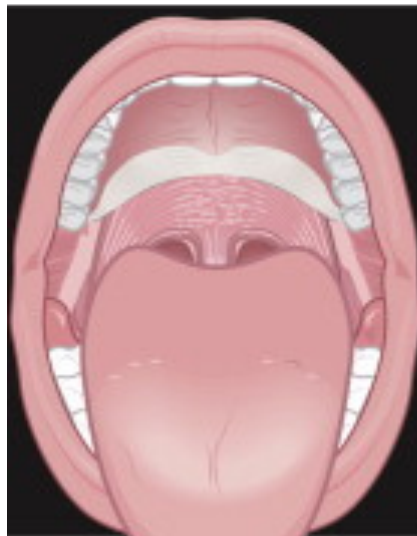
Mallampati Classification



Class I



Class II



Class III



Class IV

Induction & Intubation

- **Pre-Oxygenation!!!!**
- Extremely rapid desaturation
 - Increased oxygen demand, CO₂ production, and alveolar ventilation
 - Lower FRC
 - FRC < CC resulting in air trapping and right-to-left shunting
- “Ramping” / “Stacking” of upper chest / head
- **Awake Fiberoptic** vs. IV induction with laryngoscopy / Glidescope
- Larger doses of induction agents

Maintenance

- Continuous infusion of short-acting IV agents (propofol, inhalational)
- Short-acting paralytics (cis-atracurium, atracurium, rocuronium, vecuronium)
- Short-acting opioids (fentanyl, remifentanyl, alfentanil)
- Dexmedetomidine (Precedex) - very favorable agent for sedative & analgesic properties
- Tidal volumes of 8-10 ml/kg
- PEEP (5-10 cm H₂O)
 - May prevent Right-to-left shunting

Drug Dosing

- Medication dosing based on TBW run the risk of overdose, whereas dosing based on LBW can lead to underdosing
- In general LBW is the most appropriate dose for anesthetic drugs with the exception of NMBDs

Drug Dosing cont.

- Meds that should be dosed by IBW
 - NMBDs
- Meds that should be dosed by LBW
 - Propofol
 - Opioids
- Meds that should be dosed by TBW
 - Succinylcholine
 - Maintenance of TIVA with Propofol