

Anaesthesia for obesity

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FIBMS Anaesthesia

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Anaesthesia for obesity/ Definitions :

- Obesity is classified by the BMI. BMI is defined as weight (in kg) divided by height (in m) squared

Box 21.1 BMI definitions

BMI (in kg/m²)

- <19.9: underweight
- 20–24.9: normal
- 25–29.9: overweight
- 30–39.9: obese
- 40–49.9: morbidly obese (35–49.9 with co-morbidities)
- 50–59.9: super obese
- 60–69.9: super super obese
- >70: hyper obese

Physiological disturbance :

Cardiovascular

- cardiac output, myocardial demand, arterial pressure, and blood volume.
- LV failure and pulmonary vasoconstriction
- HTN , IHD , DM

Physiological disturbance :

Respiratory system :

- Restrictive lung disease Pattern
 - chest wall compliance
 - Lung volumes by supine and Trendelenberg positions
 - FRC, ERV & TLC .
 - FRC may fall below closing capacity
 - Ventilation / Perfusion mismatch
 - Anaesthesia → 50% in FRC (normally FRC 20%) .
 - Use PEEP to improves FRC and oxygenation .

Physiological disturbance :

Respiratory system :

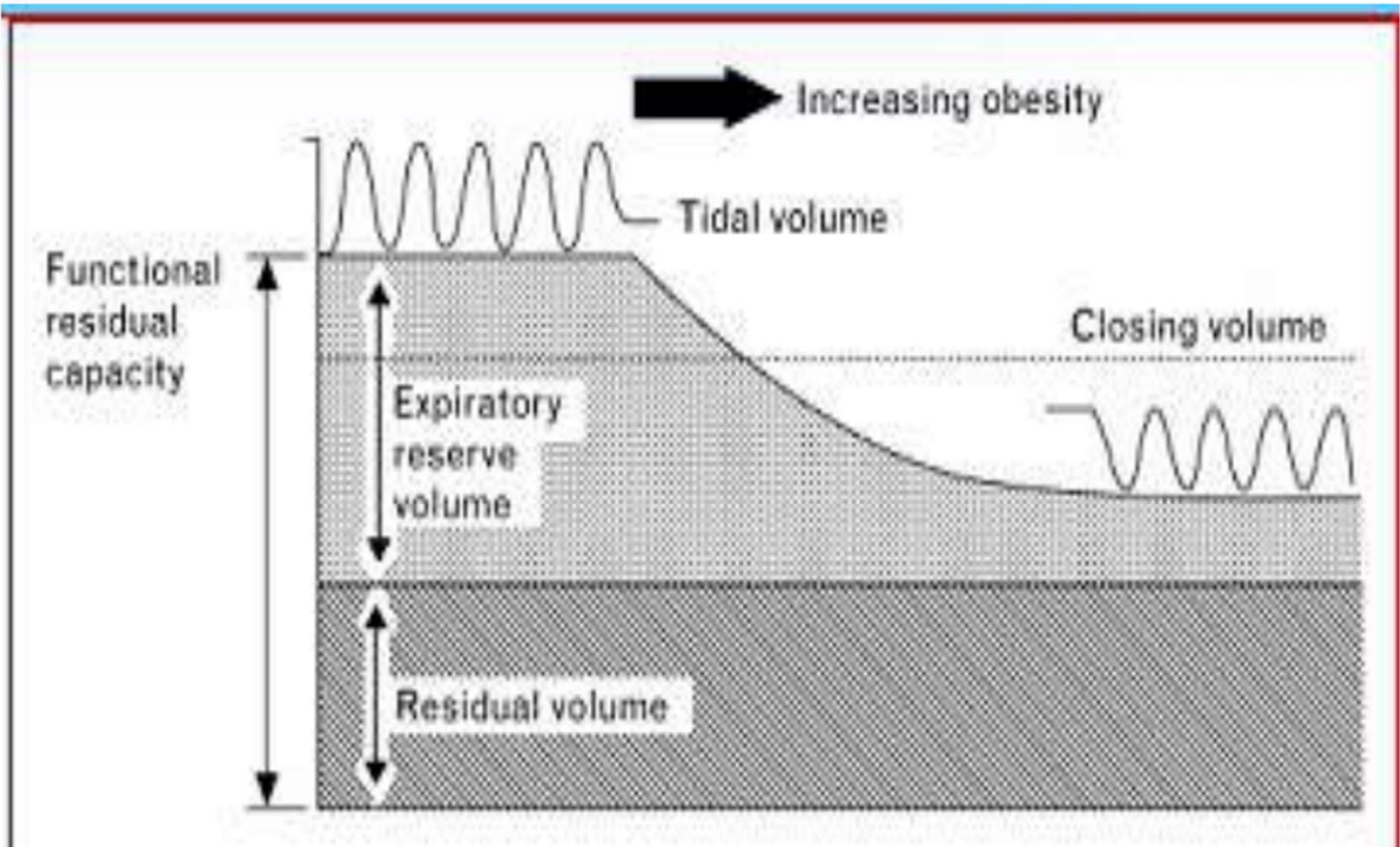
Respiratory Pathophysiology

Obesity-hypoventilation Syndrome

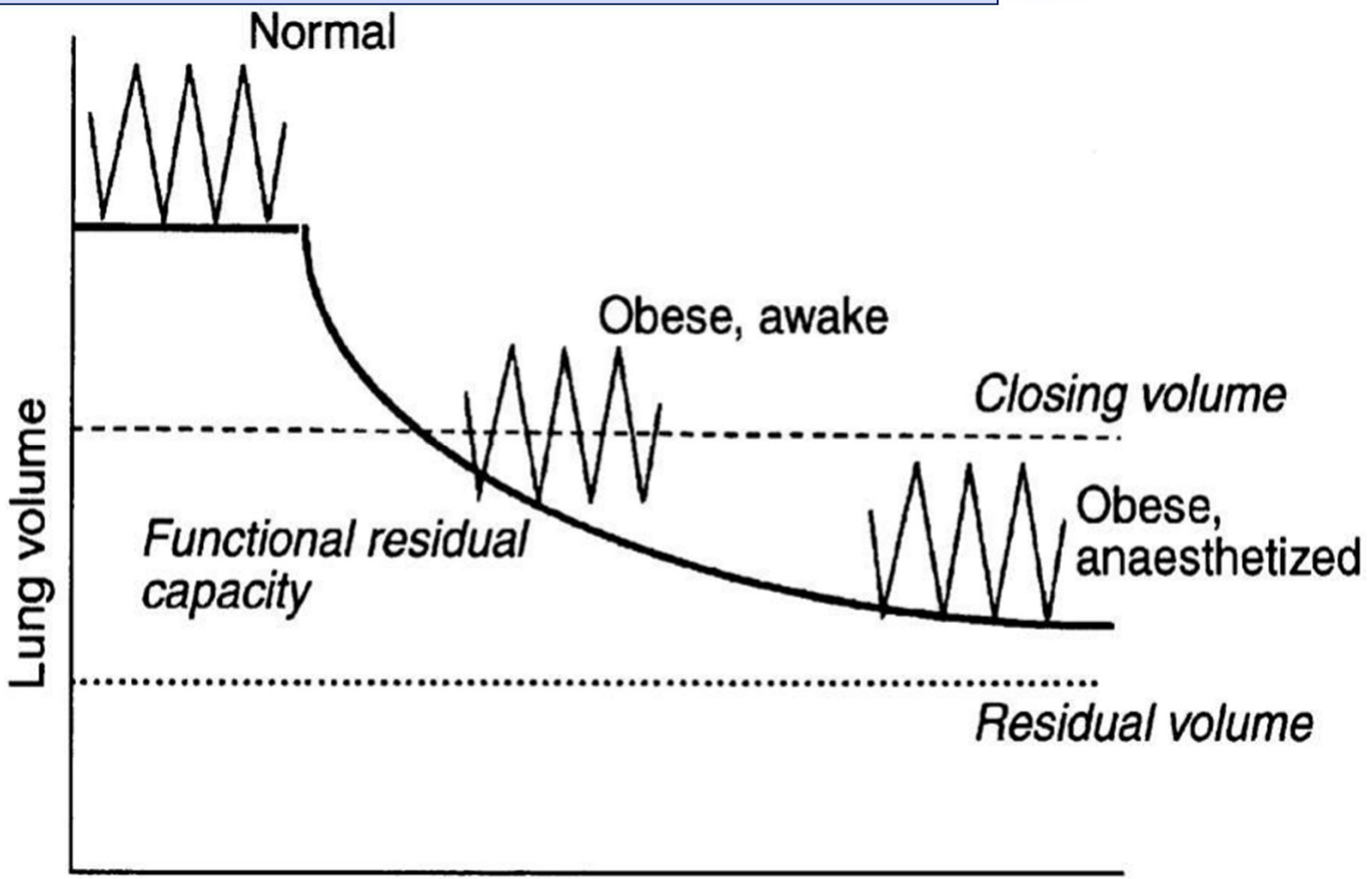
(Pickwickian syndrome)

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

Obesity & Alveolar Collapse :



Obesity & Alveolar Collapse :



Physiological disturbance :

OSAS (Obstructive Sleep Apnea Syndrome) :

- Definition

- 10 seconds or more of total cessation of airflow despite respiratory efforts
- 5 episodes per hour or 30 episodes per night
- Snoring
- Dry mouth and short arousal during sleep
- Family report apnea pauses during sleep

REGIONAL ANAESTHESIA-DIFFICULTIES :

- Difficult positioning & landmarks
- Extensive layers of adipose tissue
- Technical difficulties

Spinal Anaesthesia :



Pre anesthesia assessment :

1 - Difficult intubation and or ventilation

- Neck circumference >40 cm or mallampati 3 or 4
- Pt with home cpap >10 usually have difficult mask ventilation

2 - Associated comorbidities

- HTN, DM ,OSAS (Obstructive Sleep Apnea Syndrome)
Cardiac & Respiratory problems .
- High risk of esophageal reflux (GERD) & Aspiration .

INVESTIGATIONS :

- CBC .
- RBS .
- LFTs and Lipid Profile .
- RFTs .
- ECG .
- X-Ray chest .
- Echocardiography .
- ABGs .
- Pulmonary Function Test .

Premedication :

- * Metoclopramide, proton pump inhibitor .
- * Thromboprophylaxis (LMWH , graded elastic stockings).
- * Avoid sedative .

AIRWAY ASSESSMENT IN OBESE :

- Difficulty in mask ventilation
- Difficult intubation--Consider FOB
- Temporomandibular joint-limited mobility
- Atlanto-occipital—limited mobility
- Narrow upper airway
- Large breasts
- Excessive palatal & Pharyngeal soft tissue.
- Short and thick neck(if circumference >40 cm difficult intubation)0

Intra OR / Monitoring

- NIBP : large cuff is needed (should cover 75% or entire arm) or use forearm cuff .
- IBP required in morbid obesity with severe cardiopulmonary disease CVP, and intra op. ECHO may also be required .
- Neuro-muscular monitoring .
- Special operating table capable of holding up to 455 kg instead of 205kg for regular table

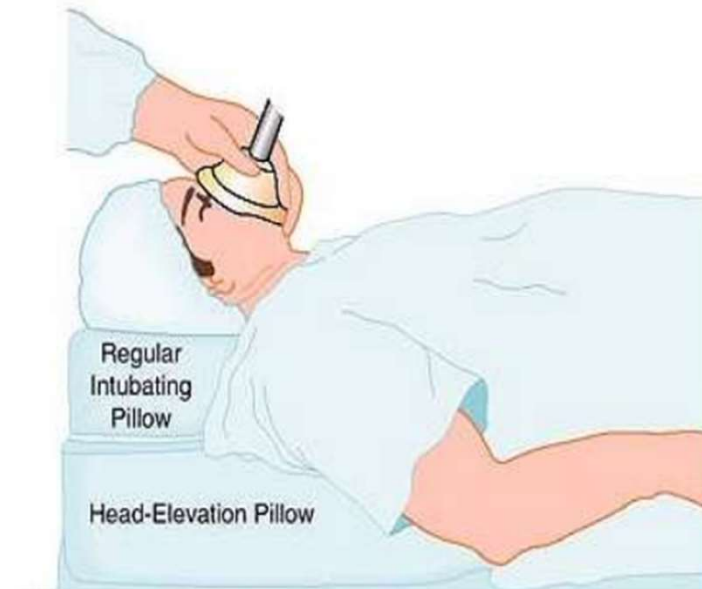
Intra OR / Intubation :

- Intubation with fiberoptic bronchoscope in selected patients.
- Rapid sequence intubation with
 - pre-oxygenation
 - cricoid pressure
 - Succinylcholine

Ramped position: to keep ears level with sternum If needed 25-30% head up Pre-oxygenation + CPAP (10-12 cm h₂o or a value equal to the level used by the patient) 10-12 cm peep. recruitment method is required (40cm of water for 40 second or 40 cm of water for 10 sec repeated 4 times)

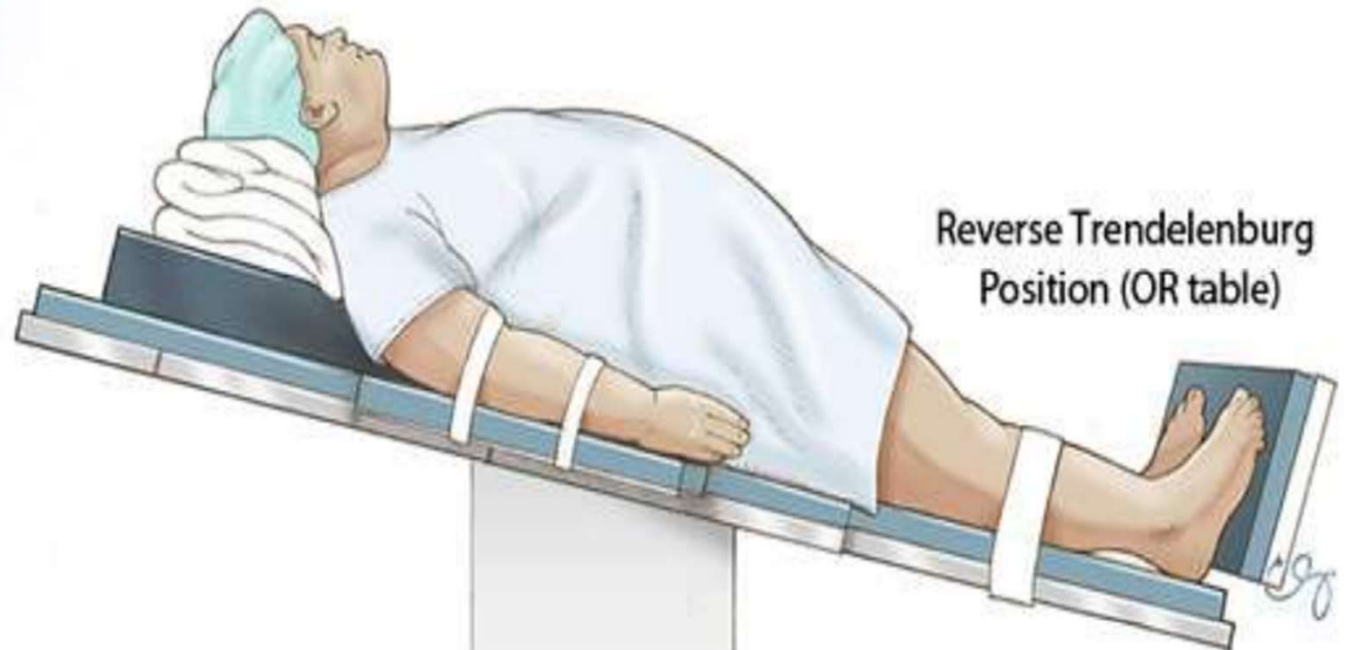
- There is no difference between PCV and VCV.

Position :



Position :

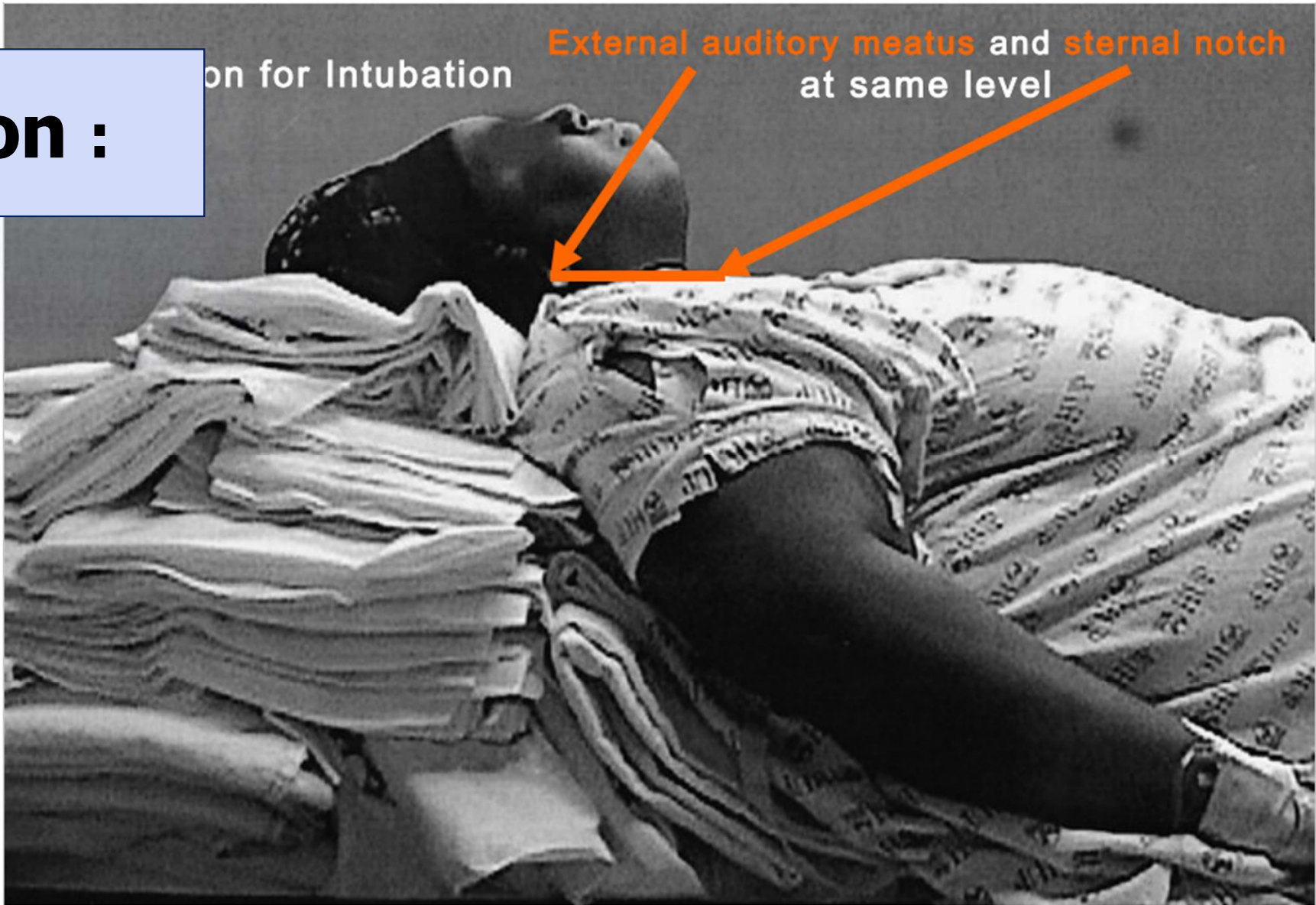
Head Elevated
Laryngoscopy Position (patient)



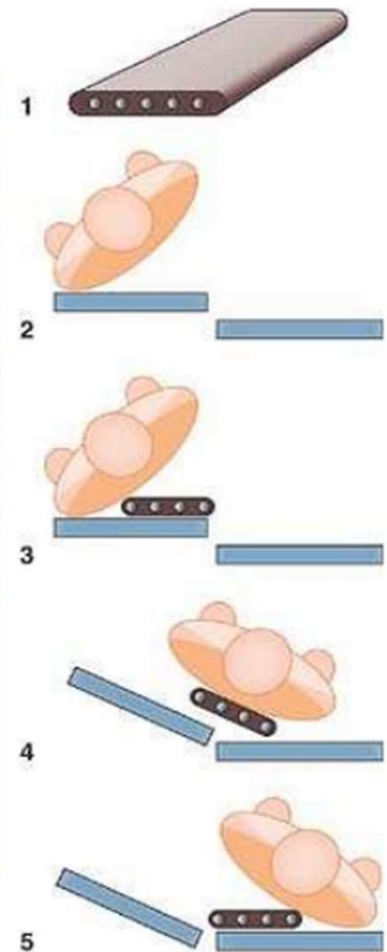
Position :

Position for Intubation

External auditory meatus and sternal notch at same level



Lifting and Transferring :



Pharmacology :

- Hydrophilic drugs (e.g. competitive neuromuscular blockers such as rocuronium, vecuronium, and atracurium) have similar absolute volumes of distribution, clearance, and elimination half-lives. Base the dose on the ideal body mass.
- Lipophilic drugs (e.g. thiopental, propofol, opioids, and benzodiazepines) have increased volumes of distribution, normal clearance, and increased elimination half-life. Titrate to cardiac output, which equates to the lean body weight in a fit patient

Pharmacology :

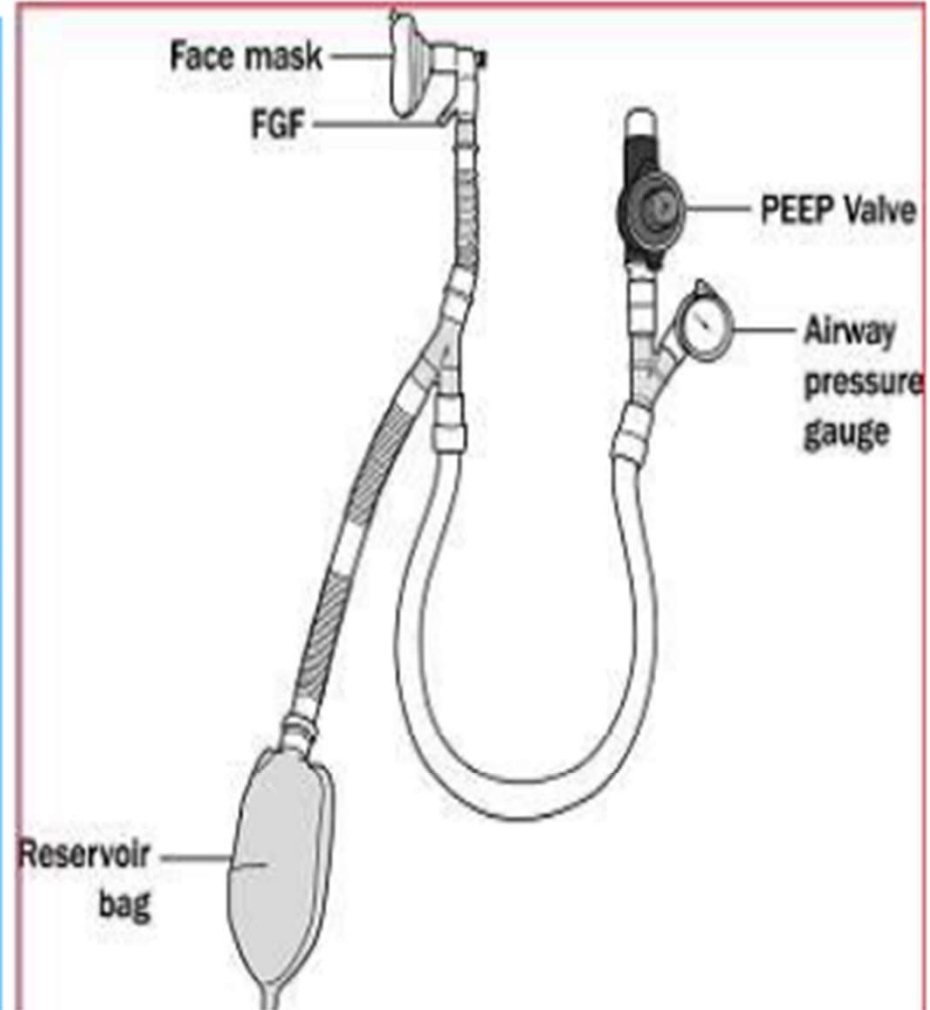
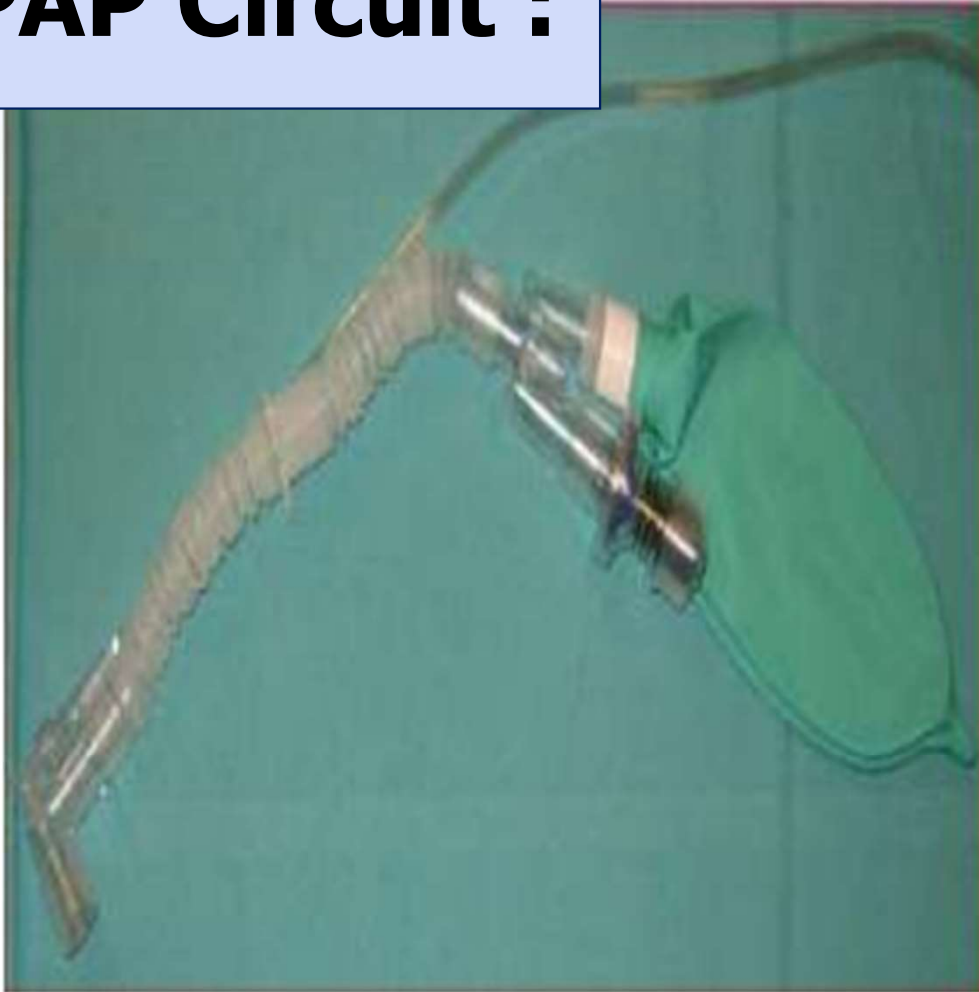
- Increased plasma cholinesterase activity. Suxamethonium dose should be based on the total body weight to a maximum of 200mg.
- **IBW** : Propofol, Vec, Rocuronium, Remifentanyl
- **TBW** : Thio, Midaz, Sch, Atra, Cis-atra, Fentanyl, Sufentanil
- Maintenance : **TBW** : Propofol
IBW : Sufentanil

POSTOPERATIVE / CONSIDERATIONS:

EXTUBATION :

- Delayed until effects of NMBAs completely reversed
- Fully awake
- Adequate airway maintenance
- Adequate tidal volume
- Supplemental oxygenation
- Modified sitting position

CPAP Circuit :



POSTOPERATIVE / COMPLICATIONS :

- * Respiratory failure
 - Pre-operative hypoxia .
 - Thoracic & upper abdominal Surgery .
- * Deep Venous Thrombosis .
- * Pulmonary Embolism .
- * Wound Infection .

Thank You

End of lecture