



Wessex **BASIC** Course

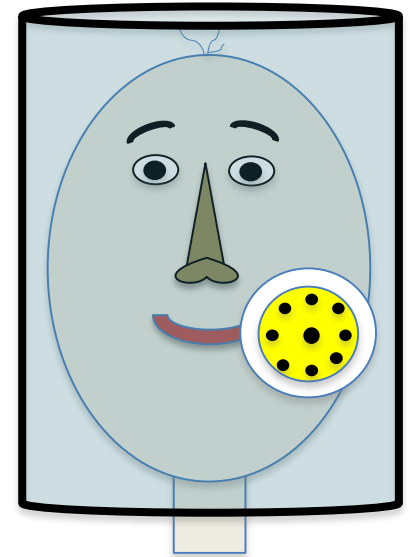
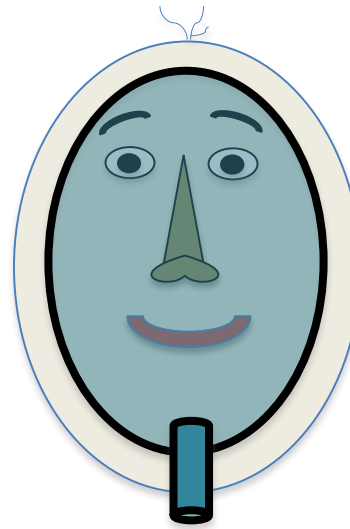
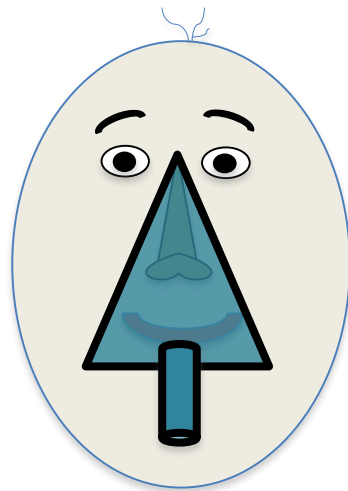
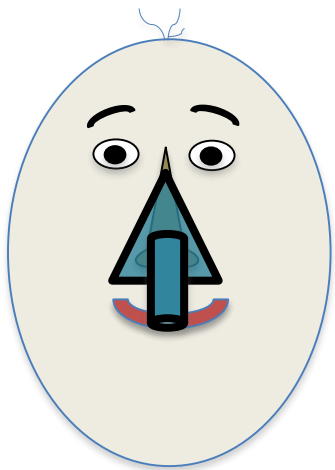
Basic Assessment & Support in Intensive Care

Non-Invasive Ventilation

NIV in Critical Care

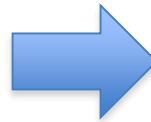
- Interfaces
- Advantages & Disadvantages
- Indications & Contraindications
- Commonly used modes

Commonly used Interfaces



Indications

- Exacerbation of COPD
- Pulmonary oedema
- Immunosuppression
- Post extubation
- Neuromuscular weakness
- OSA



- 1. Hypoxaemia**
PaO₂ <8kPa on high F₁O₂
- 2. Respiratory acidosis**
pH <7.30, pCO₂ >6kPa
- 3. Increased work of breathing**

NIV

Advantages

- Avoid intubation
- Easy and quick to set up
- Intermittent
- No sedation required
- Movement & communication
- Airway reflexes preserved
- Eating and drinking possible
- Reduced infection risk

Disadvantages

- Uncomfortable air flow
- Claustrophobia
- Pressure sores, eye irritation
- No airway protection
- Gastric distension
- Poor seal and leak
- Inability to suction
- Retained secretions

NIV

May delay intubation !!!

Contraindications

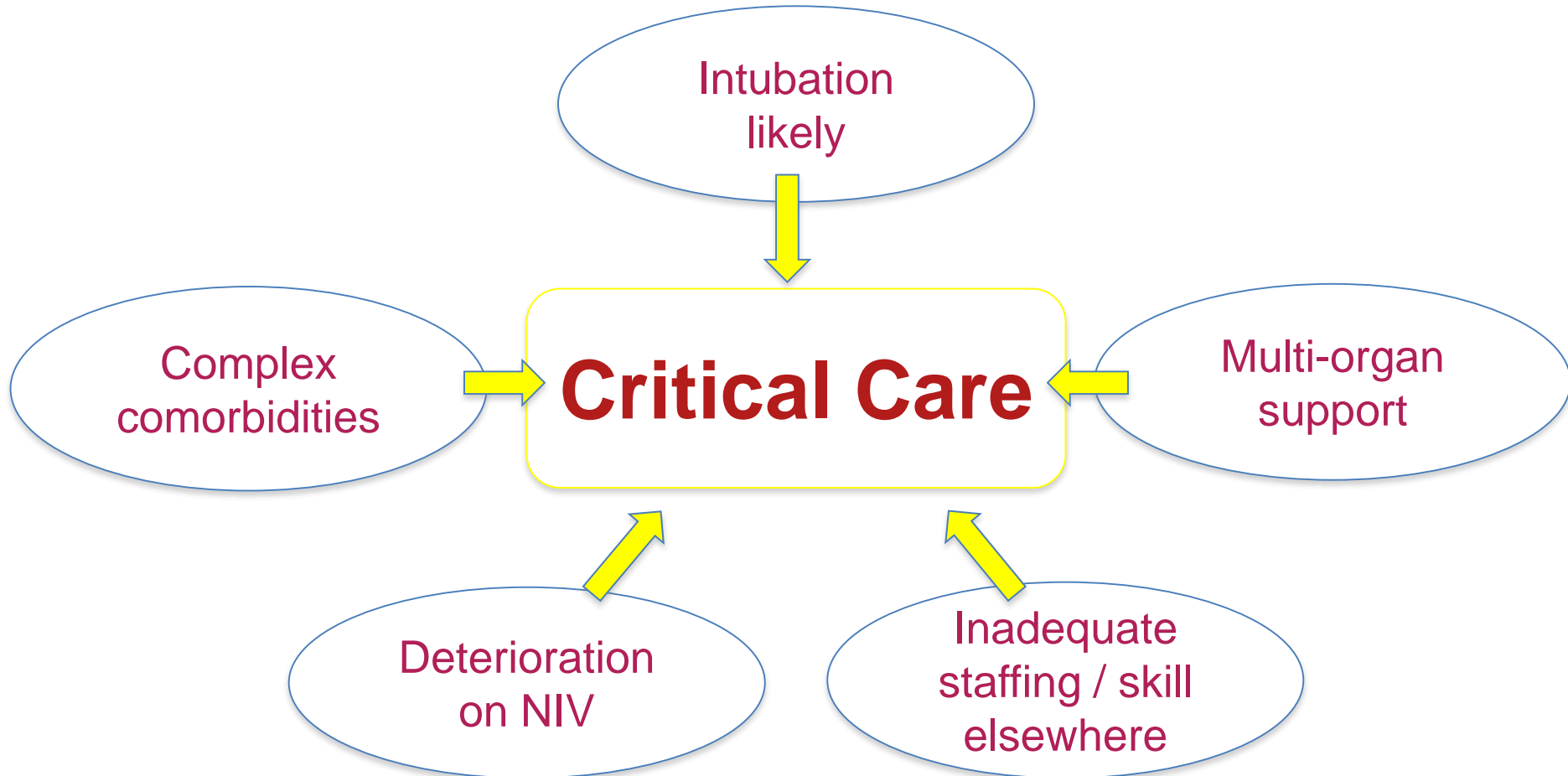
Any condition that requires intubation!

- Airway not patent or at risk
 - e.g. Trauma, Haemorrhage, Burns
- High ventilation pressures
- Coma
- Haemodynamic instability
- Severe acidosis

Caution

- Uncooperative patient
- Excessive secretions; weak cough
- Severe pneumonia
- Asthma
- Recent oesophageal / gastric surgery
- Morbid obesity
- Continuous, prolonged support required

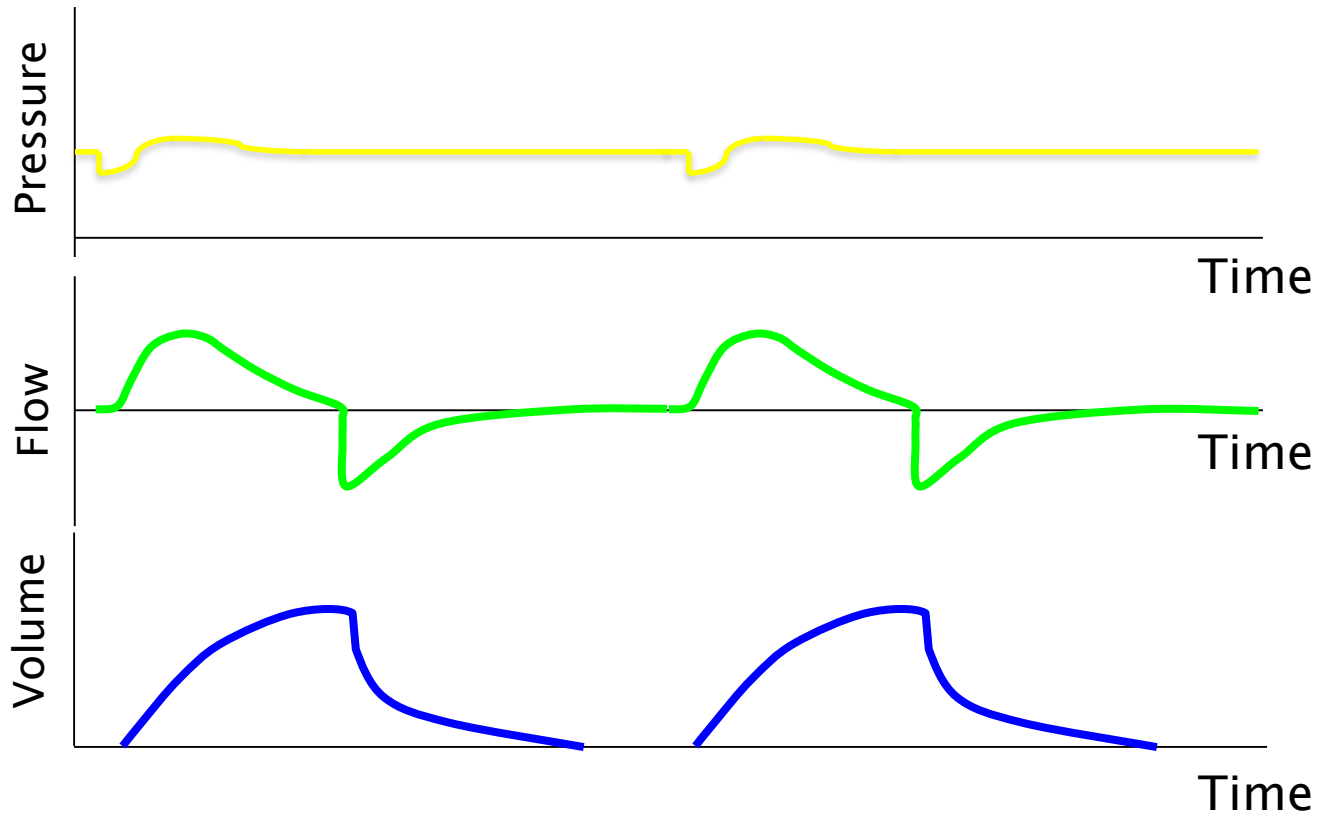
Location



Commonly used modes

- **CPAP**
- **Bi-Level Positive Airway Pressure (e.g. BiPAP®)**

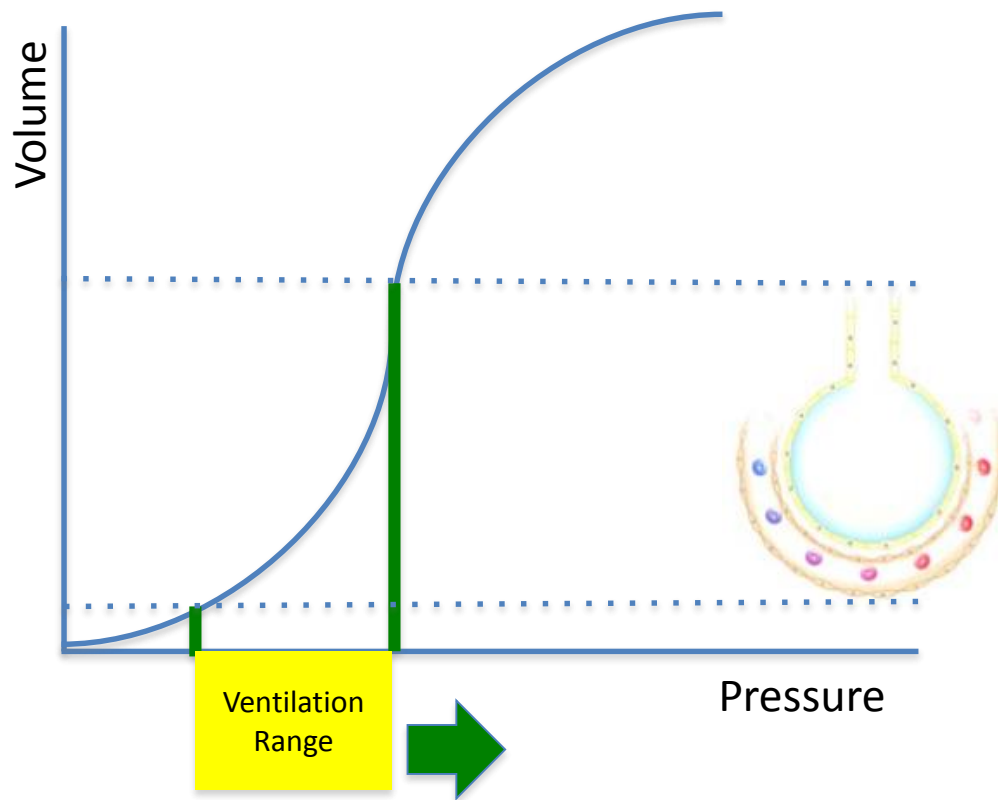
CPAP



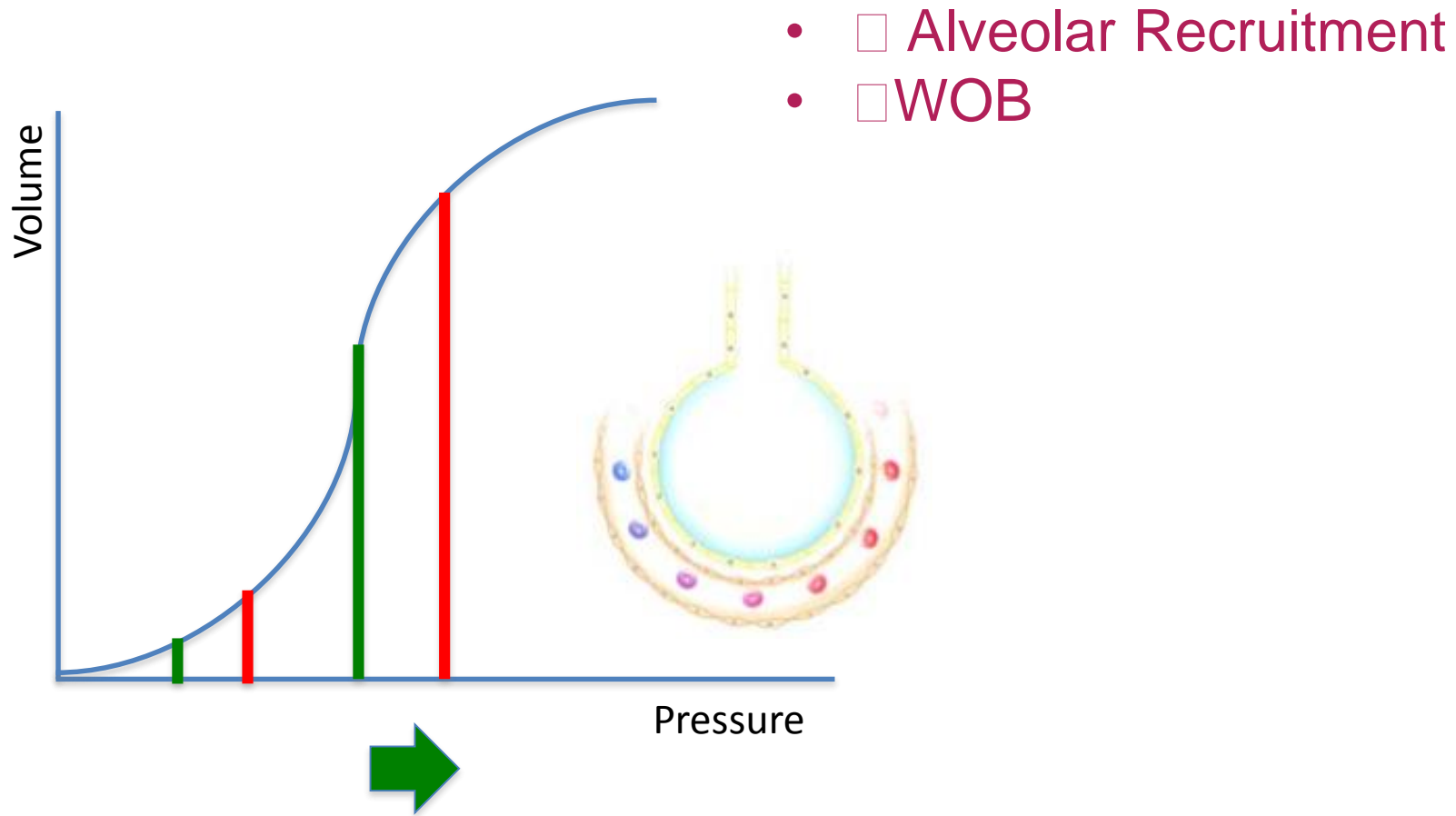
CPAP

- Mechanism:
 - Alveolar recruitment
(↑ FRC & pO₂)
 - Improves compliance
(↓ WOB)
 - Reduces LV transmural pressure
(↓ afterload; also ↓ preload)
- Who?
 - Hypoxic Respiratory Failure
 - Pulmonary Oedema

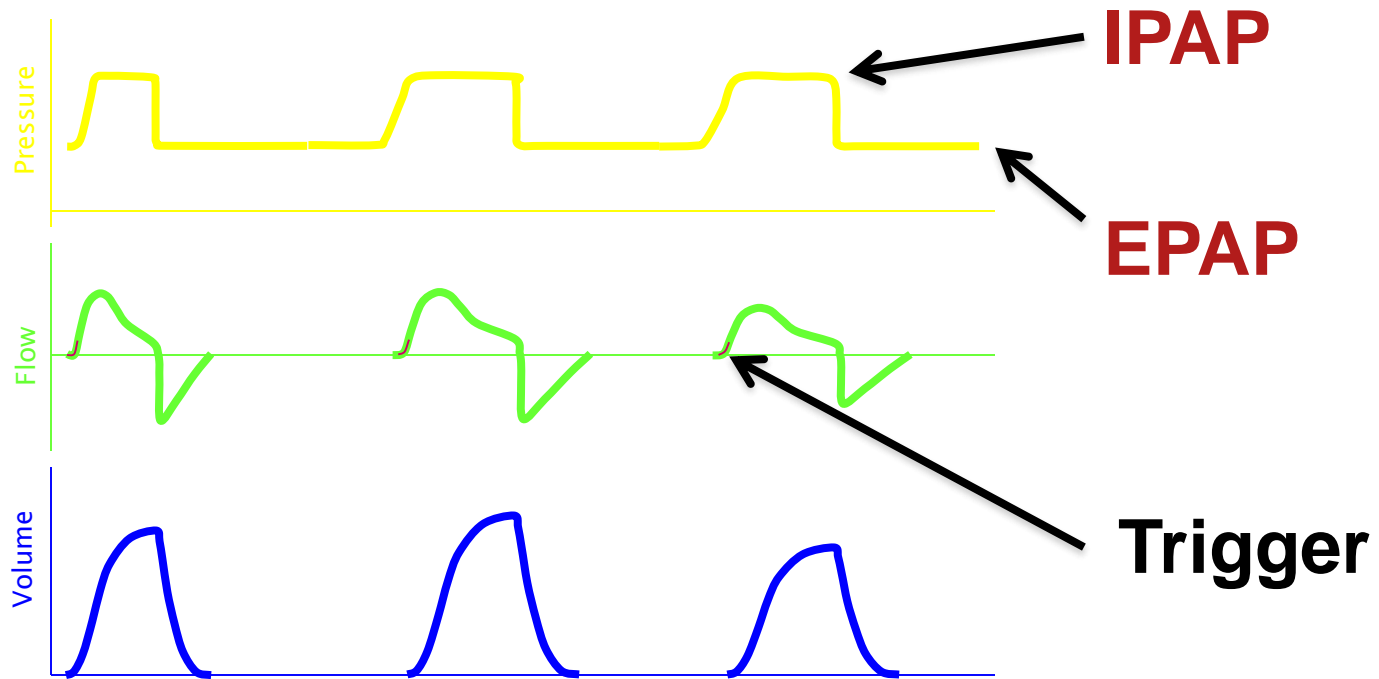
Lung compliance



Lung compliance



Bi-Level Positive Airway Pressure (BiPAP[®])



Bi-Level Positive Airway Pressure

- Mechanism:
 - Effects of CPAP
 - Further ↓ WOB and possibly ↑ pO₂
 - ↑ Minute Ventilation; improved CO₂ clearance
- Who?
 - Hypercapnic respiratory failure (e.g. COPD)
 - Patient tiring (often only as holding measure)

Practical Aspects

- Mask size and fit
- Patient psychology
- Start at low pressures and increase gradually
 - CPAP: CPAP 5 cmH₂O → 10-15 cmH₂O
 - BiLevel: IPAP 8-10 cmH₂O → 2 cmH₂O increments
EPAP 5 cmH₂O → 8-10 cmH₂O

NIV Summary

- May avoid intubation in some patients
- Do not delay intubation!
- Patients may deteriorate rapidly
- Location
- CPAP & Bi-Level
- The “art” and psychology of NIV