

Emergency care for Acute Respiratory Failure

Worry values:

PaO₂ of less than 60mmHg oxygen (while on oxygen)

PaCO₂ of more than 50mmHg + pH of < 7.35

Alveolar→capillary transport of CO₂ is only affected in VERY SEVERE DISEASE (diffuses readily and rapidly)
→ tightly controlled by respiratory centre of the brain

PaO₂ = Limited influence on breathing (significant hypoxia required)

WHY IS IT LIKE THAT? Either...

- **Failure of Ventilation**
Respiratory pump failure, eg. chest wall problems, flail chest etc.
lung compliance problems
- **Failure of Oxygenation**
Non-ventilated alveoli with enough arterial supply, eg. lung collapse
ORA Non-perfused alveoli with enough ventilation, eg. pulmonary embolism
- **Combination of the two**
Eg. asthma

HOW DO YOU KNOW WHERE THE PROBLEM IS?

→**BLOOD GASES WILL TELL YOU HOW TO TREAT**←

PaCO₂ = is the patient able to exhale enough CO₂?

PaO₂ = is the patient able to get enough O₂ in?

ASSESS HYPOXIA FIRST as this is the one most likely to kill them quickly

HYPERCAPNEA

- **BIPAP** : support respiratory effort through the inspiration phase
 - Patient must be breathing spontaneously
 - Must have adequate tidal volume
 - Glasgow coma scale 14 or above
 - May need to give fluids IV to maintain blood pressure above 100 systolic
- End-Expiratory Pressure keeps the alveoli open for improved gas exchanges, therefore sats improve

HYPOXIA

- **Increase the oxygen delivery by mask**
- **CPAP**
 - Patient must be breathing spontaneously
 - Must have adequate tidal volume
 - Glasgow coma scale 14 or above
 - May need to give fluids IV to maintain blood pressure above 100 systolic
 - May agitate patient: if so, reduce PEEP
 - If sats still crap, increase PEEP

Patient is still in respiratory distress?

INVASIVE MECHANICAL VENTILATION: intubate them

Primary goal is to oxygenate

Secondary goal is to avoid barotrauma (leads to pneumothorax and ARDS)

→ so don't let pressures rise above 30 (watch the ventilator dial)

Tertiary goal is to normalise CO₂

CONTROL CARBON DIOXIDE BY REDUCING VENTILATION

CONTROL OXYGENATION BY ADJUSTING OXYGEN FLOW RATE