

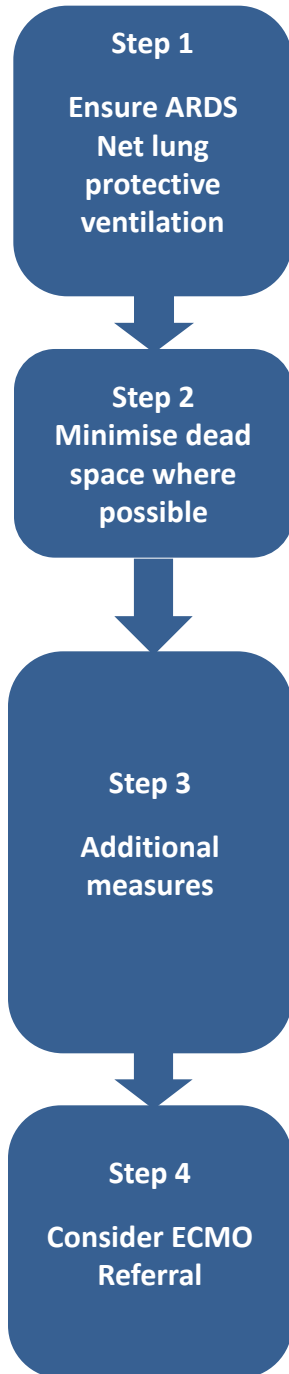
Trouble shooting: Hypercapnia

AIM: To provide a practical quick reference guide for Critical Care doctors in managing hypercapnia

SCOPE: Ventilated adult patients in Critical Care excluding those with head injury or where neuroprotective ventilation is a priority

Note: in the context of ARDS or acute lung injury, hypercapnia is not considered a problem if ARDSnet ventilation is being followed and $pH > 7.2$. Reducing $PaCO_2$ can be done by minimising dead space and increasing minute ventilation (Mv) within the constraints of ARDSnet goals.

Critical Care Tips and Trick for junior doctors



ARDS Net Goals	Ideal Body Weight (kg)
<ul style="list-style-type: none"> • $PaO_2 \sim 8kPa$ or P/F ratio > 13.3 (may tolerate lower PaO_2 if not acidaemic) • $P_{plat} < 30$ cmH_2O • V_t 6-8ml/kg IBW • Accept high pCO_2 if $pH > 7.2$ 	Male = $50 + 2.3 \times ((height_{cm}/2.54) - 60)$ Female = $45.5 + 2.3 \times ((height_{cm}/2.54) - 60)$

If a trained anaesthetist, consider:

- Largest ETT possible
- Remove unnecessary ventilator tubing
- Cut ETT if possible

Consider the following options:

- **Increase RR** – may need to alter I:E ratio to allow enough time for full expiration. Reduced time for inspiration, allows more time for expiration BUT P_{max} may go up
- **Optimise PEEP**. Make sure suitable PEEP for the patient
- **Recruitment manoeuvre**: increase PEEP by 2cmH20 every two minutes ensuring CVS stability then return to baseline PEEP
- **APRV** – see guideline , consultant led
- **Paralysis**
- **Conservative fluid management**
- **Prone positioning** – see SOP for prone positioning

If still unable to achieve normal pH and ARDS Net goals, consider ECMO referral

Criteria include:

- Murray Score > 3 – see hypoxia trouble shooting guideline
- Potentially reversible acute lung disease
- Uncompensated hypercapnoea with $pH < 7.2$

Senior consensus discussion is recommended at this stage