Acute Respiratory Distress Syndrome (ARDS) Strategy

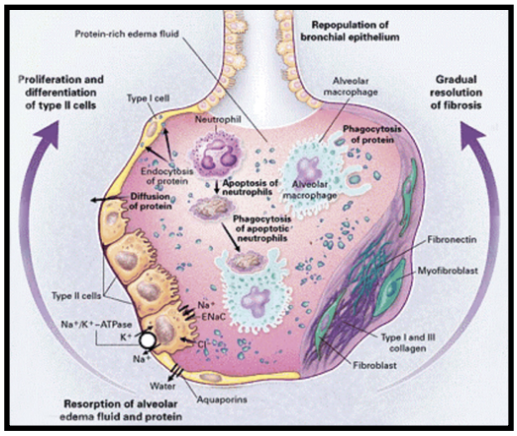
ARDS is a syndrome with a variety of aetiologies

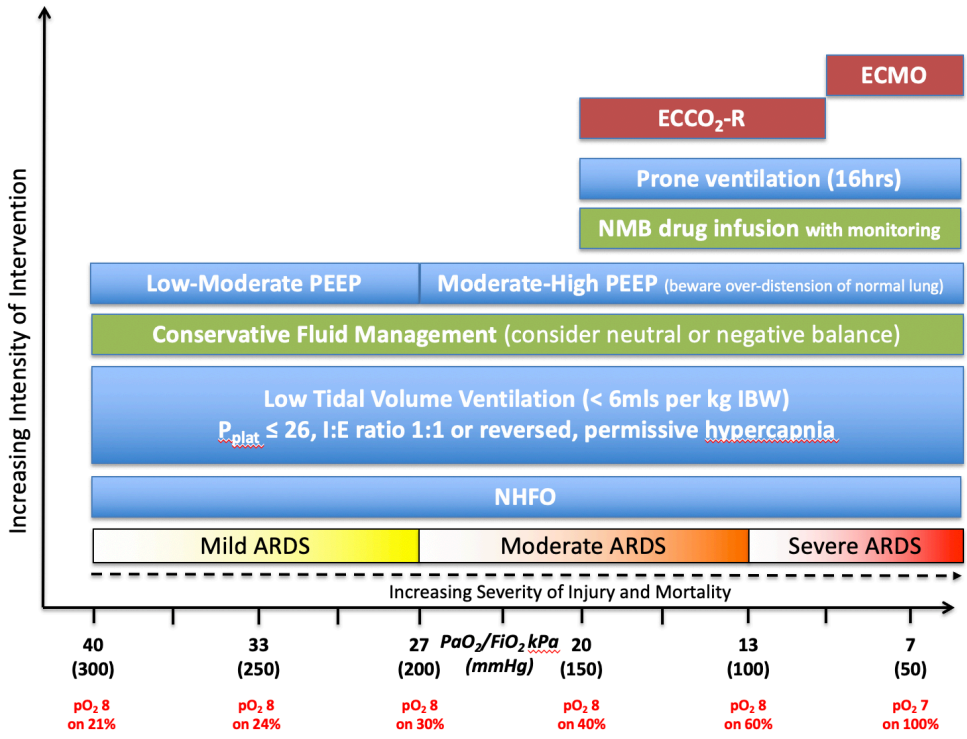
	Berlin Definition of Acute Respiratory Distress Syndrome
Timing	Within one week of a known clinical insult or new or worsening respiratory symptoms
Chest Imaging (CXR or CT)	Bilateral opacities – not fully explained by effusions, lobar/lung collapse, or nodules
Origin of Oedema	Not fully explained by cardiac failure or overload Echo' excludes hydrostatic oedema
Oxygenation	***Mild*** P/F ratio* of 27kPa to 40kPa with PEEP ≥ 5cmsH_2O
	Moderate P/F ratio* of 13kPa to 27kPa with PEEP ≥ 5cmsH_2O
	Severe P/F ratio* of <13kPa with PEEP ≥ 5cmsH_2O

*P/F ratio = PaO_2(kPa)/$Fi0_2$(decimal)

Management

- **Identify and treat any precipitating causes**
- **Oxygenation problems may be due to other problems e.g. cardiac failure**
- **See figure below – Target PaO_2 ≥8kPa**
- **AVOID HYPEROXIA**





Management Strategy and Considerations for Daily Review

Breathing

- Aim for the lowest FiO_2 and PEEP combination to achieve oxygenation goals
- Set pO_2, pCO_2 and PEEP targets
  Tolerate hypercapnia but consider each patient e.g. raised ICP, excessive acidaemia
- Calculate and document Tidal Volumes. Specify 4-6mls/kg predicted body weight, utilise bed-side posters:

  Male = 50 + (0.91 x (height in cm – 152.4))

  Female = 45 + (0.91 x (height in cm – 152.4))
- Beware of over-distension of normal parts of lung – esp. with higher PEEP levels and plateau pressures >26cmH_2O. Plateau pressure may be acceptable up to 30cmH_2O. See below.
- Chest examination can change – consider effusions, pneumothoraces, worsening oedema

Circulation

- Calculate fluid balance. Run patient 'dry'. Target neutral to -1000mls if tolerated
- May require additional vasopressor support (where tissue perfusion allows)
- Consider CVVH for fluid removal

Drugs

- Review medications. May need diuretic infusions
- Review/replace electrolytes

Imaging

- Review chest imaging and repeat if not current

Extra-corporeal therapies

- ECMO referral via Signpost (or ARI ECMO co-ordinator on 07917 068628) if meet referral criteria

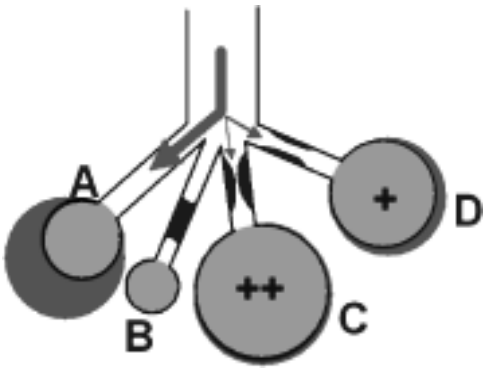


Figure 1, above, shows with the same PEEP and ΔP, depending on the alveolar disease/compliance and the terminal bronchiole degree of obstruction, you may get no alveolar ventilation, under distension or over distension, even in the same lung.

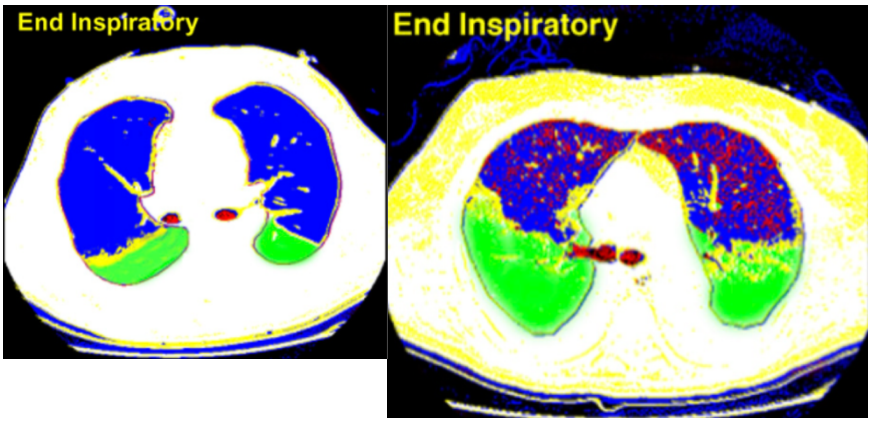


Figure 2, above, from Terragni's study, shows with the same lung protective ventilation of 6ml/kg, you may get over-distension of lung (red areas) even within plateau pressure limits.
The left image has a plateau pressure of 25-26cmH_2O
The right image has a plateau pressure of 28-30cmH_2O

References

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