MECHANICAL VENTILATION WRAP UP

Adel Mohamad Alansary

INDICATION AND START UP

NIV

COPD

Cardiogenic Pulmonary edema

INTUBATE SAFELY

CXR AND ABG

Within 30 min.

CHOOSE PRESSURE MODE IF MONITORING IS AVAILABLE

SBT

Use predefined criteria

30 MIN. TO TWO HOURS MAX.

Sedate using a score (Ramsay)

TURNING, POSITIONING, TREATMENT OF CAUSE

Monitor vital data, ventilator waves

Ventilator Strategies

Settings

- Tidal volume 6 mL/kg IBW
  - Scaling volume to IBW rather than lung capacity may not prevent ventilator-induced lung injury
- Keep end-inflation hold/Pplat < 30 cm H_2O
  - Assumes normal chest wall mechanics
  - Does not protect against ventilator-induced lung injury in patients with overdistension/persistent diaphragm activity
- Recruitment maneuver/adjust PEEP to maintain gains
  - Adhere to Pplat guidelines
  - Prevent increase in driving pressure during titration
- Driving pressure < 20 cm H_2O
  - Assumes normal chest wall mechanics and surface tension in recruited alveoli

Data from Hubmayr RD, et al. *Intensive Care Med.* 2015;41:2184-2186.

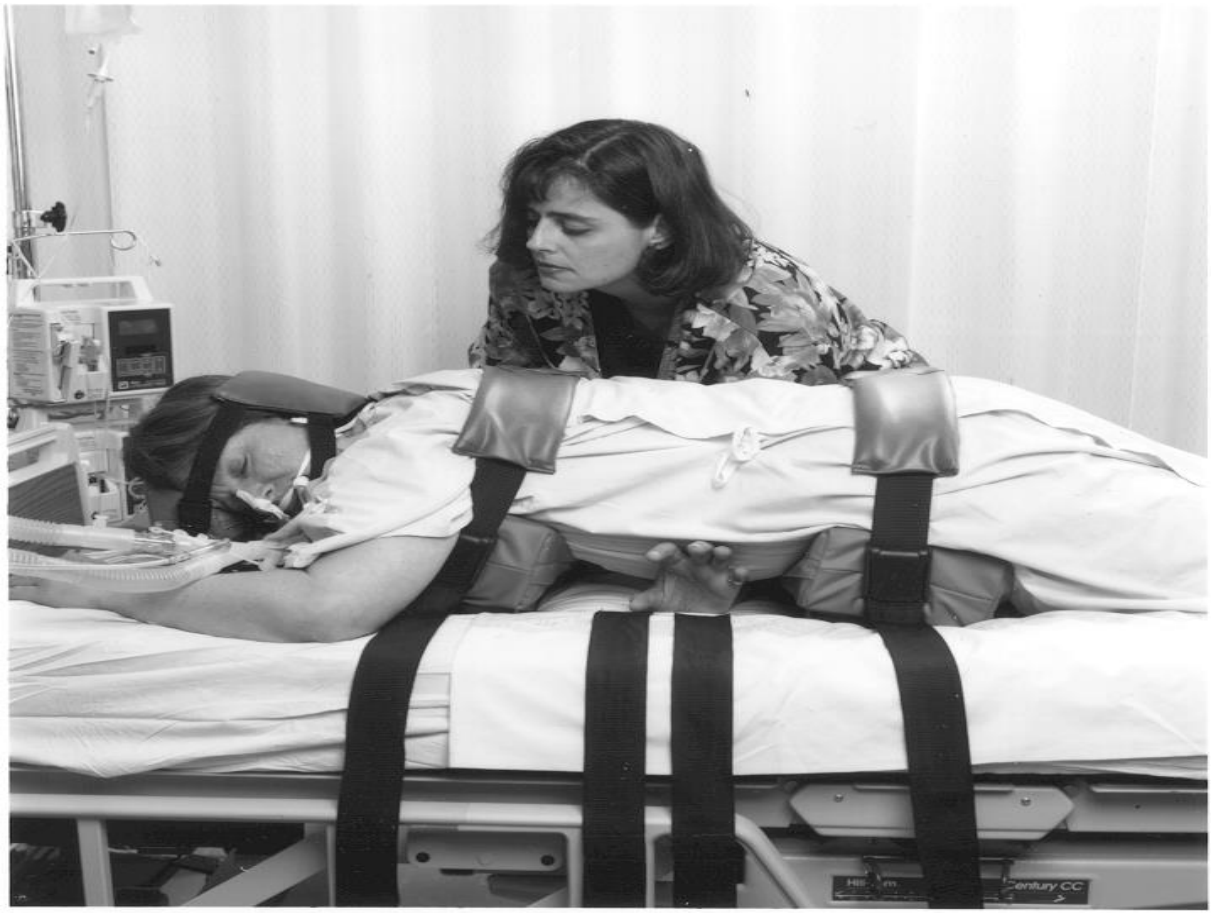
Driving Pressure = Pplat – PEEP

Driving pressure > 19 cm H_2O associated with higher risk of hospital death compared to lower pressures.

- Better correlated with outcome than Pplat in an analysis of several large trials
- Surrogate for lung recruitability in ARDS
- Recent series suggest not a continuous variable
  - Keep driving pressure < 19 cm H_2O

Data from Amato MB, et al. *New Engl J Med.* 2015;372:747-755; and Villar J, et al. *Crit Care Med.* 2017;45:843-850.

Prone Ventilation



American Thoracic Society Guidelines: Mechanical Ventilation in ARDS

- Strong/moderate **FOR:**
  - Lung-protective ventilation
    - Pplat < 30 cm H_2O
    - Vt 6 mL/kg IBW
      - 4-8 mL/kg IBW
  - Prone ventilation
- Conditional/moderate
- Higher PEEP ventilation
  - Impact of ART trial?
- Recruitment maneuvers
  - Impact of ART trial?
  - LOVS 40 cm H_2O × 40 sec

- Moderate/high **AGAINST:**
  - HFOV: harm
- No recommendation
  - ECMO: EOLIA trial
- Driving pressure: no prospective data and not included in analysis

Data from Fan E, et al. *Am J Respir Crit Care Med.* 2017;195:1253-1263.

A: Daily Sedation Interruption Decreases Mechanical Ventilation Duration

- Hold sedation infusion until patient is awake, then restart at 50% of previous dose
- Awake defined as any 3 of the following:
  - Open eyes in response to voice
  - Use eyes to follow investigator on request
  - Squeeze hand on request
  - Stick out tongue on request
- Intervention vs. control
  - Length of mechanical ventilation 4.9 vs. 7.3 days
  - ICU length of stay 6.4 vs. 9.9 days
  - Decreased need for diagnostic assessment for change in mental status (6 vs. 16 patients)
  - No increase in PTSD or cardiac ischemia

Data from Kress JP, et al. *N Engl J Med*. 2000;342:1471-1477; and Needham DM, et al. *Crit Care Med*. 2012;40:502-509.

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