



MECHANICAL VENTILATION BASICS

Initial Ventilator Settings

- Set ventilator to Volume Assist/Control: Consider pressure support as needed
- Set driving mechanics by type of ventilation
 - Tidal Volume at 4-6 ml/kg Ideal Body Weight
 - Quick Reference (Male): (Appendix A)
 - 66" = ~380cc [min: 255 / max: 510]
 - 69" = ~420cc [min: 283 / max: 566]
 - 72" = ~465cc [min: 310 / max: 621]
 - 75" = ~505cc [min: 338 / max: 676]
- Set Rate to maintain proper minute ventilation (Ve) of 4-8 L/min (Vt x RR) Example: Ve of 6L/min=Vt of 500ml x RR of 12/min
- Set FiO2: Start at 100% and rapidly titrate down (Goal=40%) using ABGs/SpO2 (Goal SpO2 = >92%)
- Set Inspiration:Expiration (I:E) ratio: 1:2
- Set appropriate PEEP
 - 5 cmH2O and up titrate as needed
 - Consider starting hypoxic patients at 10 cmH2O
 - Remember increased PEEP can decrease SBP
- Use continuous capnometry/capnography (ETCO2), Especially in TBI patients
- Calculate O2 requirements
 - Minute Ventilation x FiO2 = LPM of pure O2
 - LPM x mission length (min) = Total L of pure O2
 - Example: Ve of 6LPM @ 50% FiO2 = 3 LPM of O2 required D cylinder (425L O2) will last ~141 min using 3 LPM
 - Consider 1.5x planning factor

Troubleshooting Hypoxia - **DOPE**

Displacement of Advanced Airway/ Endotracheal Tube AA/ETT

- Visual confirmation ETT is in the airway
- Pull back if advanced
- Do NOT advance blindly without bougie
- If in doubt remove AA/ETT and use BVM
- Consider advanced airway (supraglottic or cricothyroidotomy)
- If AA/ETT moves freely, assess bulb for rupture

Obstructions

Suction secretions in AA/ETT as needed

Pressure

High pressure alarm on vent or high airway pressures noted.

- Tension pneumothorax/hemothorax
 - Chest tube in place/properly
 - Suctioning/not kinked or clamped
 - If suspected tension pneumothorax → needle decompression
- Obstruction (mucus plug)
 - Suction, irrigate with 10cc NS, resuction
- Auto PEEPing or breath stacking (disconnect circuit and gently squeeze chest for full exhalation and adjust settings)
- Circumferential burn patients not tolerating ventilation
 - Consider escharotomy
 - Consider additional paralysis/sedation

Equipment

- Ventilator failed?
- O2 tank empty?
- Trace circuit to/from patient ensuring patency/connections

(Utilize waveform capnography to help determine cause)

Airway Compromise/Lost Airway

Immediately disconnect ventilator and use manual BVM (plus PEEP if avail) with 100% O2

- Initial Tidal Volume based on IBW (target 6cc/kg IBW)
- ETCO2 monitored when available (target 35-45 mmHg)
- Adjustments to RR, Vt, FiO2, and PEEP based on clinical indicators and documented
- Patients arrive with PaCO2 of 35 – 45 mmHg



This information is pulled from the evidence-based Joint Trauma System (JTS) Mechanical Ventilation Basics Clinical Practice Guideline (CPG). JTS CPGs can be found at the [JTS CPG website](#) or the [JTS Deployed Medicine site](#).