

Mechanical Ventilation Protocol

Summary for ROSE

PART I: VENTILATOR SETUP AND ADJUSTMENT

1. Calculate predicted body weight (PBW)
Males = $50 + 2.3 [\text{height (inches)} - 60]$
Females = $45.5 + 2.3 [\text{height (inches)} - 60]$
2. Controlled ventilation mode required during NMB. After NMB, select any ventilator mode capable of delivering the prescribed V_T (6ml/kg PBW, +/- 2 ml/kg)

OXYGENATION GOAL: PaO₂ 55-80 mmHg or SpO₂ 88-95%

1. Use a minimum PEEP of 5 cm H₂O.
2. Adjust FiO₂ or PEEP upward within 5 minutes of consistent measurements below the oxygenation target range
3. Adjust FiO₂ or PEEP downward within 30 minutes of consistent measurements above the oxygenation target range.
4. The below high PEEP strategy FiO₂/PEEP table should be used in all patients. See Protocol Section 5.3.3 for when deviation is permitted.

PEEP/FiO₂

FiO ₂	.30	.40	.50	.60	.70	.80	.90	1.0
PEEP	5	5-16	16-20	20	20	20-22	22	22-24

PLATEAU PRESSURE GOAL: ≤ 30 cm H₂O

Check Pplat (0.5 second inspiratory pause), at least q 4h and after each change in PEEP or V_T .

1. **If Pplat > 30 cm H₂O**: decrease V_T by 1ml/kg steps (minimum = 4 ml/kg).
2. **If Pplat < 25 cm H₂O and V_T < 6 ml/kg**, increase V_T by 1 ml/kg until Pplat > 25 cm H₂O or V_T = 6 ml/kg.
3. **If “severe dsypnea”** (more than 3 double breaths per minute or airway pressure remains at or below PEEP level during inspiration), then raise V_T to 7 or 8 ml/kg PBW if Pplat remains below 30. If Pplat exceeds 30 cm H₂O, then revert to lower V_T and consider more sedation.

pH GOAL: ≥7.30

1. If pH < 7.30: May give NaHCO₃ (neither encouraged nor discouraged)
2. If pH < 7.15: V_T may be raised and Pplat limit suspended (neither encouraged nor discouraged)
3. If pH < 7.30: incremental increase in RR allowed to max rate of 35.

I: E RATIO GOAL

Recommend that duration of inspiration be ≤ duration of expiration.

PART II: WEANING

Conduct a SPONTANEOUS BREATHING TRIAL daily when:

1. More than 12 hours since enrollment
 2. $FiO_2 \leq 0.40$ and $PEEP \leq 8$.
 3. PEEP and $FiO_2 \leq$ values of previous day.
 4. Systolic BP ≥ 90 mmHg without vasopressor support.
 5. Spontaneous respirations (if 1-4 are met and NMB still infusing may stop NMB to assess for spontaneous respirations).
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SPONTANEOUS BREATHING TRIAL (SBT):

If all above criteria are met initiate a trial of UP TO 120 minutes of spontaneous breathing with $FiO_2 \leq 0.5$ using any of the following approaches:

1. Pressure support ≤ 5 cm H₂O, PEEP ≤ 5 cm H₂O
2. CPAP ≤ 5 cm H₂O
3. T-piece
4. Tracheostomy mask

Assess for tolerance using the following:

1. $SpO_2 \geq 90$: and/or $PaO_2 \geq 60$ mmHg
2. Spontaneous $V_T \geq 4$ ml/kg PBW
3. $RR \leq 35$ /min
4. $pH \geq 7.3$
5. No respiratory distress (distress= 2 or more)
 - HR $> 120\%$ of baseline
 - Marked accessory muscle use
 - Abdominal paradox
 - Diaphoresis
 - Marked dyspnea

If tolerated for at least 30 minutes, consider extubation.

If not tolerated resume pre-weaning settings.

Definition of UNASSISTED BREATHING

1. Extubated with face mask, nasal prong oxygen, or room air, **OR**
2. T-tube breathing, **OR**
3. Tracheostomy mask breathing, **OR**
4. CPAP less than or equal to 5 cm H₂O **without pressure support or IMV assistance OR**
5. Use of CPAP or BIPAP solely for sleep apnea management