

Pediatric Ventilator Wean and Extubation Protocol

Exclusion Criteria

- PCICU patients
- Presence of tracheostomy tube
- Neuromuscular disease
- Severe TBI
- Patients with critical airway and deemed 'PCAT'
- Patients on high frequency ventilation

Meets criteria for ventilator weaning (assess every 4 hours)

- Underlying reason for intubation resolving/resolved
- Stable ventilator settings (non-escalated) for 4 hours
- Mean airway pressure (MAP) ≤ 15
- Stable FiO₂ ($\leq 50\%$) for greater than/equal to for 4 hours
- Tolerating SBS goal of -1 or 0
- Spontaneous breathing
- Not under neuromuscular blockade

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Begin wean (after RT/MD/RN discussion)

Perform leak test daily – consider dexamethasone when within 12 hours of extubation

| Setting | Weaning Parameter | Frequency | Comments | Goals |
|---|-------------------------|-----------|--|---|
| Respiratory Rate (RR) | 2-6 breaths/min | 2-4 hours | Wean if normal RR for age | <u>Ventilation</u> Maintain EtCO ₂ /Tcom similar to prior (≤ 5) Maintain Minute Ventilation Minimize work of breathing |
| Pressure Support (PS) | 2-4 cm H ₂ O | 2-4 hours | Wean to maintain target pressure support tidal volume: Vt > 5 mL/kg | |
| PC (if in Pressure Control Ventilation) | 2 cm H ₂ O | 4-8 hours | Wean to maintain delta P such that target tidal volume: Vt $> 6-8$ mL/kg | |
| PEEP (positive end expiratory pressure) | 1-2 cm H ₂ O | 4-8 hours | | <u>Oxygenation</u> Maintain FiO ₂ $\leq 50\%$ Maintain SpO ₂ $\geq 90\%$ |

Fail wean criteria

- Increased FiO₂ $\geq 50\%$ for > 4 hrs
- Tachycardia > 25 BPM from baseline
- Tachypnea $> 20\%$ increase for > 2 hrs
- Asynchrony with ventilator
- Increased work of breathing
- Increased EtCO₂/PaCO₂

- ↓
- Pause wean
 - Return to prior settings
 - Address failure
 - Re-evaluate in 4 hours

RT q4h assessments of wean tolerance

Achieve Settings (≥ 2 hrs)
RR = 15-20 PS ≤ 10 PEEP ≤ 6

Ensure NPO status
Perform ERT/SBT

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PASS
EtCO₂/Tcom ≤ 5 from baseline
RR normal for age
Exhaled Vt ≥ 5 mL/kg

↓
No anatomic and/or neurologic impairment

↓
NPO
(4 hrs breast milk, 6 hrs formula)

↓
EXTUBATE
(after RT/MD/RN discussion)

Tolerate – continue wean

Age related RR ranges

| Age | RR |
|---------------|---------|
| < 6mo | 20 - 60 |
| 6 mo to 2 yrs | 15 - 45 |
| 2 to <5 yr | 15 - 40 |
| ≥ 5 yr | 10 - 35 |

↓
FAIL
Return to prior settings
Discuss with medical team
Address failure
Retry ERT/SBT in 8 hrs

ERT/SBT (2 hours)

- FiO₂ 50%
- PEEP 5
- PS 10 for ETT 3.0-3.5 cm
- PS 8 for ETT 4.0-4.5 cm
- PS 6 for ETT ≥ 5.0

Anatomic/Neurologic Impairments

- Evidence of airway trauma/edema
- Absence of gag and/or cough reflex
- Evidence of tracheomalacia
- Recent airway surgery
- Neuromuscular weakness
- Presence of EVD and/or elevated ICP
- Active seizures



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