

Management Guideline for Evolving Chronic Lung Disease in Extremely Preterm Infants

The objective of this guideline is to standardize respiratory management in extremely preterm infants from 2-3 weeks of age till term corrected gestational age.

Ventilation goals

PH	PCO ₂	SpO ₂
≥7.25	55-70	88 90-94 (<37 weeks) ≥95 (≥37 weeks)

Mechanical ventilation

- Choice of ventilatory strategy in acute phase ventilation (until 34 weeks PMA)
 - Maintain high frequency jet ventilation (HFJV) for infants born <25 weeks or <500g
 - Strongly consider HFJV for infants born <26 weeks or <750g
 - Strongly consider volume control/ volume guaranteed ventilation for infants on conventional mechanical ventilation with tidal volumes set at 4-6ml/kg
 - Gradually increase HFJV rate or slowly increase I time in infants on conventional ventilation based on clinical needs as chronic lung disease evolves over time
 - Consider upsizing endotracheal tube or use of cuffed tube if significant air leak
- Choice of ventilation strategy in chronic phase ventilation (from 34 weeks PMA)
 - Strongly consider invasive NAVA or chronic phase conventional ventilation (refer to section on chronic ventilatory strategies)

Extubation criteria

- Minimum ventilator settings for RDS (<3-4 weeks)
 - Pressure control: FiO₂ ≤0.3, rate ≤25, PIP ≤18, PEEP ≤6
 - Volume control: FiO₂ ≤0.3, rate ≤25, VT ≤ 6ml/kg, PEEP ≤6
 - NAVA: FiO₂ ≤0.3, level <0.5, PEEP ≤6
 - HFJV: FiO₂ ≤0.3, Jet PIP ≤20, Jet rate 300-420, Jet MAP <7-8
- Minimum ventilator settings for CLD (>3-4 weeks)
 - MAP <10-12, FiO₂ <0.45
- Safe airway
- pH ≥ 7.25, pCO₂ ≤ 55
- May use Wayne State extubation success calculator (<http://extubation.net/>) to evaluate the probability of successful extubation

Non-invasive respiratory support

- Extubate to CPAP/ PEEP level of 1-2 above PEEP prior to extubation
- Consider NIV-NAVA, NIPPV or higher CPAP of 9-11 in infants with borderline probability of successful extubation (<70% on Wayne State extubation success calculator)
- Slowly wean CPAP/ PEEP once or twice a week based clinical status while maintaining adequate expansion and aeration
- **Maintain CPAP till at least 32 weeks PMA for infants <1000g at birth**

Pharmacologic Therapy for evolving chronic lung disease

- Inhaled Corticosteroids
 - Consider Inhaled Budesonide starting at 4 weeks in infants at a >50% risk of BPD using the BPD outcome estimator (<https://neonatal.rti.org/index.cfm>)
 - Discontinue Budesonide at 36 weeks PMA if no BPD
 - Discontinue Budesonide once the infant is weaned to room air, unless there is a history of airway reactivity (response to albuterol with illness)
 - Continue Budesonide through the NICU stay and at discharge if the patient is being discharged on home oxygen
- Bronchodilators
 - Consider a trial of albuterol/ levalbuterol in infants with wheezing, evidence of increased airway resistance on ventilator graphs
 - Consider scheduled albuterol/ levalbuterol if positive response following a trial evident by decreased PIP, improved airway resistance and improved ventilation
 - Consider long acting beta agonists for patients with significant obstructive airway disease
- Diuretics
 - Consider a trial of furosemide if concerns for generalized or pulmonary edema
 - Consider scheduled diuretics if positive response following a trial evident by chest x ray changes or improved lung compliance

Postnatal steroids

- Consider a course of dexamethasone (DART protocol) in infants who remains intubated after 3 weeks with >50% probability of Grade 2 or 3 BPD
- Allow at least 3-4 weeks between courses of dexamethasone
- A maximum of 2 courses of DART is recommended
- If you consider systemic steroids for BPD after 2 courses of dexamethasone on a patient >36 weeks PMA, consider a short course of prednisolone after consultation with pulmonology

Clearance of secretions

- In line suctioning preferred, don't routinely instill normal saline prior to suctioning
- If thick mucus is present and unsuccessful with dry suctioning, instill normal saline solution and perform bag suctioning
- Consider hypertonic saline in selected case
- Mucolytic DNase in selected cases

Pulmonology consultation

- Consider pulmonology consultation at 36 weeks PMA for infants with Grade 3 BPD (need for mechanical ventilation at 36 weeks PMA)
- Consider pulmonology consultation at 40 weeks PMA for infants who remains on CPAP, NIPPV or NI-NAVA
- Pulmonology consultation is recommended at least one week prior to discharge for any infants with a diagnosis of BPD

ENT consultation (laryngomalacia, airway anomalies)

- Consider ENT consultation for infants with stridor or persistent need for CPAP
- Use high PEEP to stent airway open in infants with suspected or confirmed laryngo-tracheobronchomalacia

Other

- PDA management (refer to PDA management guideline)
- Pulmonary hypertension screening and management (refer to PH guideline)
- Fluid management and nutrition (refer to NICU handbook and nutrition guidelines)
- GERD (refer to GERD guideline)

Transfer to AFCH

- Transfer infants with CLD to AFCH NICU when such infants require services that can't be provided at the Meriter NICU (eg. trial of invasive NAVA, need for rigid bronchoscopy, need for tracheostomy, need for cardiac catheterization, transcatheter PDA closure etc.)