

# Pediatric Intensive Care Unit

## Non-invasive Positive Pressure Ventilation (NPPV) Guidelines

### Indications

Hypoxemic and/or Hypercapneic Respiratory Failure associated with:

- Pneumonia/ARDS
- Immunocompromise
- Post extubation deterioration
- Neuromuscular weakness
- Asthma
- Cystic Fibrosis
- Do-Not-Intubate status
- Postoperative deterioration
- Obstructive Sleep Apnea
- Central Hypoventilation Syndrome
- Restrictive Thoracic Disease
- Cardiogenic Pulmonary Edema
- COPD

### Goals

- To reduce work of breathing
- To stabilize/improve gas exchange
- To facilitate clearance of secretions
- To avoid intubation

### Exclusionary Considerations (determined by physician)

- Intrapulmonary air leaks
- Bullous pulmonary disease
- High risk of aspiration (absent cough or gag)
- Life threatening hypoxemia
- Hemodynamic instability
- Apnea
- Recent gastric surgery/trauma
- Recent facial surgery/trauma/burns
- Mask intolerance (Claustrophobia)
- Refractory patient-ventilator dissynchrony
- Sinusitis/Otitis Media

### Side Effects

Assess at regular intervals for:

- Gastric distension (The physician may decide to reduce feedings, make the patient NPO, or place an oro/naso-gastric tube. The routine use of an oro/naso-gastric tube is not recommended as it may prevent an adequate seal of the mask.)
- Facial pressure erosions from mask
- Eye irritation/drying

### Interfaces

Nasal mask	Nasal Pillows	Full Face Mask
<ul style="list-style-type: none"> <li>▪ Allows speech and swallowing</li> <li>▪ Good tolerance</li> <li>▪ Possible erosions on bridge of nose</li> <li>▪ Large leak via mouth may interfere with pressure delivery and prevent use</li> </ul>	<ul style="list-style-type: none"> <li>▪ Allows speech and swallowing</li> <li>▪ Good tolerance</li> <li>▪ Possible erosions on nares</li> <li>▪ Large leak via mouth may interfere with pressure delivery and prevent use</li> </ul>	<ul style="list-style-type: none"> <li>▪ Interferes with speech and swallowing</li> <li>▪ Permits mouth breathing</li> <li>▪ More stable delivery of ventilating pressures</li> <li>▪ Greater potential for gastric distension</li> </ul>

## Ventilating Devices

	LTV	BiPAP S/T 30
Patient Profile	Acute illness Requires $FiO_2 \geq .40$	Chronic illness Requires $FiO_2 < .40$ Home BiPAP use
Modes	PS CPAP PC/S/PS PC/AC VC/S/PS VC/AC	EPAP Spontaneous Spontaneous/Timed Timed
Oxygen Delivery	.21 – 1.00 via blender	.21 – .60 via added O <sub>2</sub> flow
Set parameters	PIP PEEP Rate Inspiratory Time (mandatory breaths) Rise Time Flow Termination Time Termination Sensitivity	IPAP EPAP Rate Inspiratory Time % (mandatory breaths)
Alarms	<u>Built-in:</u> High Pressure + pop-off Low Pressure Low Minute Ventilation Apnea	<u>Added-on:</u> High Pressure, no pop-off Low Pressure

## Humidification Devices

- Cool Passover: Small to moderate, loose secretions
- Warm Passover: Moderate to large, thick secretions

## PICU Discharge

Stabilized patients who require long term NPPV use can be discharged from the PICU. Ask the PICU charge nurse to consult the guidelines in the Pediatric Clinical Practice Committee's "Guidelines for Floor Placement Related to Specific Therapies."