

VALLEYCARE
OLIVE VIEW-UCLA MEDICAL CENTER/HEALTH CENTERS
RESPIRATORY CARE SERVICES – NICU
POLICY & PROCEDURE

NUMBER: 1714
VERSION: 1

SUBJECT/TITLE: NCPAP/NIPPV APPLICATION IN THE NICU

POLICY: NCPAP/NIPPV is a therapy mode applied and maintained by the respiratory therapy department.

PURPOSE: NCPAP/NIPPV Application in the NICU

DEPARTMENTS: RESPIRATORY CARE SERVICES

DEFINITIONS:

CPAP is the application of positive pressure to the airway of a spontaneously breathing patient. It works in the treatment of patients with unstable lung mechanics by maintaining inspiratory and/or expiratory pressures at levels that are above ambient pressure.

CPAP increases functional residual capacity and decreases airway resistance. The benefits of CPAP/ NIPPV include:

- a. Decrease the work of breathing
- b. Improve static lung compliance
- c. Stabilize minute ventilation
- d. Allows the delivery of a larger tidal volume for a given pressure

NCPAP/NIPPV Indications

1. Respiratory distress noted on physical assessment:
 - a. the presence of increased work of breathing
 - b. an increase in respiratory rate
 - c. substernal and suprasternal retractions
 - d. grunting, and nasal flaring
 - e. pale or cyanotic skin color

SUBJECT/TITLE: NCPAP/NIPPV APPLICATION IN THE NICU
Policy Number: 1714
Page Number: 2

2. Inadequate arterial blood gas values:
3. The presence of poorly expanded and/or infiltrated lung fields on chest X-ray.
4. The conditions responsive to CPAP and associated with one or more of the clinical presentations in:
 - a. Respiratory distress syndrome.
 - b. Pulmonary edema.
 - c. Atelectasis.
 - d. Recent extubation.
 - e. Tracheal malacia or other similar abnormality of the lower airways.
 - f. Transient tachypnea of the newborn.

NCPAP/NIPPV

Contraindications

- Bronchiolitis
- The need for intubation and mechanical ventilation
- Upper airway abnormalities i.e. choanal atresia, cleft palate, tracheoesophageal fistula
- Cardiovascular instability and impending arrest
- Unstable respiratory drive with frequent apneic episodes resulting in desaturation and/or bradycardia
- Ventilatory failure as indicated by the inability to maintain PaCO₂ < 50 torr and pH > 7.25
- Untreated CDH (congenital diaphragmatic hernia)

Hazards/Complications

- Obstruction of nasal prongs from mucus plugging or kinking of nasopharyngeal tube may interfere with delivery of CPAP and result in a decrease in oxygen delivery.

SUBJECT/TITLE: NCPAP/NIPPV APPLICATION IN THE NICU

Policy Number: 1714

Page Number: 3

- Complete obstruction of nasal prongs and nasopharyngeal tubes results in continued pressurization of the CPAP system without activation of low or high airway pressure alarms.
- Activation of a manual breath (from the infant ventilator) may cause gastric distention potentially leading to aspiration, and patient discomfort.
- Impedance of pulmonary blood flow with a subsequent increase in pulmonary vascular resistance and decrease in cardiac output.
- Nasal irritation with septal distortion.
- Skin irritation and pressure necrosis.
- Nasal mucosal damage due to inadequate humidification.

NIPPV

Nasal intermittent positive pressure ventilation (NIPPV) is a method of delivering mandatory pressure cycled breaths. NIPPV is a useful method of augmenting the beneficial effects of NCPAP, and reduces the incidence of extubation failure more effectively than NCPAP. It has recently become possible to synchronize delivery of NIPPV with the infants own breathing. Side effects include gastric perforation have been reported.

PROCEDURE: NCPAP (nasal continuous positive airway pressure) application includes

1. NCPAP
2. NIPPV

NCPAP is accomplished by inserting

- Nasopharyngeal tubes
- Nasal prongs to the patient
- High Pressure Nasal Cannula

These devices are attached to a circuit with warmed and humidified gas flowing from a continuous-flow mechanical ventilator in the N-CPAP mode.

NCPAP/ NIPPV Application

SUBJECT/TITLE: NCPAP/NIPPV APPLICATION IN THE NICU

Policy Number: 1714

Page Number: 4

- Check and confirm doctor's order
- The orders should include the cmH₂O. CPAP for nasal or from 6 to 10 cmH₂O pressure.

Gather supplies:

- Select the appropriate NCPAP binasal airway size from "Neotech" 2.5, 3.0, 3.5, or 4.0

OR

- Select the appropriate NCPAP cannula airway size from "Hudson RCI" size No 0, 1, or 3

OR

- High pressure nasal cannula
- Appropriate size suction catheter 6 or 8 F
- Normal saline
- Lubricating jelly
- Pink tape
- Appropriate size endotracheal tube holder to fit infant (optional)
- Adhesive
- Scissors
- Infant continuous flow ventilator with heater and breathing circuit

Procedure:

- Place the patient in a supine position.
- Monitor patient vital signs throughout the procedure.
- With normal saline and suction catheter lavage and suction both nares for patency.
- Cleanse the top of the lip and both cheeks.
- Open the adhesive, break the vial and apply solution to the cheeks where the endotracheal tube holder will seat.

SUBJECT/TITLE: NCPAP/NIPPV APPLICATION IN THE NICU

Policy Number: 1714

Page Number: 5

- Allow adhesive to dry.
- Remove the plastic tabs from the endotracheal tube holder.
- Apply the endotracheal tube holder to the patient's cheeks, one side at a time. Assure the center is midline to the face between the nose and the top lip.
- Tear approximately 2 inches of tape and set aside for immediate usage.
- If using the binasal airway, open the K-Y jelly and Neotech CPAP device.
- Connect the infant ventilator electrical plugs, air and oxygen lines. Turn machine on in the CPAP mode.
- Apply small amount of jelly to the tip of the CPAP cannula.
- Gently, insert the airway into the nares until the tips are in the nasopharynx.
- Attach the ventilator circuit connector to the distal end of the nasal prongs. Secure both pieces together with pink tape

OR

If using the Hudson RCI cannula,

- Open package and place the knit cap on the patient.
- Use your scissors cut the Velcro tape in half and separate the attached pieces.
- Adhere both of the cloth sidepieces to the temple area of the knit cap.
- Remove the patient "Y" from the blue and white tubing on the circuit and attach to the ends of the Hudson nasal prongs. Place the proximal pressure airway line to the Hudson nasal prongs.
- Turn on the ventilator, set the flow from 6 to 10 Lm and adjust the CPAP to the ordered settings. *The pressure can be set by pressurizing the circuit and dialing in the ordered cmH₂O pressure.
- Insert the nasal prongs into both nares and attach the circuit tubing to the knit cap using the Velcro tape.

SUBJECT/TITLE: NCPAP/NIPPV APPLICATION IN THE NICU

Policy Number: 1714

Page Number: 6

Documentation

All documentation will be done in the hospital EHR, ORCHID. The NIPPV / NCPAP documentation is in the Non Invasive Ventilation section.

Documentation can also be done by clicking on the NIPPV task in the Multi-patient Task List (MPTL).

References: 1) <i>The Cochrane Library</i> (ISSN 1464-780X). 2) <i>Respiratory Care</i> article (Respir Care 1994; 39(8): 817-823) AARC Clinical Practice Guideline. Application of Continuous Positive Airway Pressure to Neonates via Nasal Prongs or Nasopharyngeal Tube.	
Approved by: Arnold Panganiban (Chief of Respiratory Therapy), Richard Findlay (Unassigned)	Date: 05/17/2019
Review Date: 05/17/2022	Revision Date:
Distribution: Medicine, Nursing 3C - Neo-Natal Intensive Care Unit, Respiratory Care	
Original Date: 05/17/2019	