Nurse's role in the care of a neonate on CPAP in the Neonatal Intensive Care Unit (NICU) in a low resource setting

Background

Worldwide, about 2.9 million deaths in neonates are related to severe respiratory distress. Respiratory distress is when a neonate presents with clinical signs indicating difficulties in breathing.[1] Continuous Positive Airway Pressure (CPAP) is a therapy that can be used on premature and term infants to improve oxygenation to the lungs and prevent alveoli from collapsing [2, 3] Nurses are an important resource of the care system as they care for neonates on CPAP [4]

Purpose

- To develop an evidence-based practice guideline that will identify the best evidence to inform practice for nursing caring for a neonate on CPAP and how it can relate to our low-income, limited resourced settings.
- This guideline was developed through a topic-specific scope review to identify evidence relating to each aspect of care and the identification, appraisal and contextual adaptation of existing guidelines produced by international advanced nurse practitioners and professional societies.

Flow chart for the care of a neonate on CPAP

This flow chart is to be used in conjunction with the full evidence-based practice guideline (available from the author) and appropriate staff education and training.

Medical order of CPAP is needed by a Doctor (Dr) or Advanced Practice Nurse (APN) (in consultation with Dr)[5,6,10]

CPAP settings with positive end-expiratory pressure (PEEP) 4-8cm (but can be higher up to 10 cm H_20 in some clinical conditions e.g. bronchiolitis, severe chronic lung disease and tracheal issues) [4,5,6,10]

Continuous monitoring of peripheral capillary oxygen saturation (SpO2). The usual target range for a term infant = 92–98% and preterm infant = 90–95% or as directed by doctor according to specific clinical needs
Humidifier and circuit to have an airway temperature of 40°C with a humidifier temperature of 37°C [4]

Nursing care

Hourly vitals:
Check infant's vital signs hourly and compare with normal range of gestational age
Axillary temp: 36.5 °C – 37.2 °C
Heart Rate: 120 - 160 bpm
Respiratory Rate: 30 - 60 bpm
Blood Pressure: 60 - 84 (systolic) 35 - 65 mmHg (diastolic) [4,5]
Check water levels in the humidifier hourly[4,6]

Recommended nasal prong sizes based on the infant's weight:
Size 0: Infants: 700g
Size 1: Infants 700–1250,
Size 2: Infants 1250–2000g
Size 3: Infants 2000–3000g
Size 4: Infants >3000g
Size 5: Infants >3500g [2]

Position:
Utilise prone and semi-prone position during nursing care and when infant is undergoing continuous cardiac/respiratory monitoring [unless contraindicated]
2-4 hourly position change [4,6,7,8]
Encourage Kangaroo Mother Care (KMC) [unless critically ill or contraindicated][4]

Prevention of septal damage:
Use correct size of nasal prongs based on the infant's weight
Use Vaseline on nares as a protective barrier
Position binasal prongs 2 mm from the nares
Secure prongs in place with a snug fitting hat
Use saline drops to moisten the nares every 2 hours[2,4]

Feeding:
Oral feeding by breastfeeding or bottle is usually possible in the clinically stable infant on CPAP

Family support:
Early involvement of the family in the infant's care helps to reduce stress
Provide information and educate parents regarding the disease process and treatment (CPAP)
Encourage family to be present during ward rounds [5,6,9]

Is the neonate copying on CPAP?
Signs that the infant is tolerating CPAP include no signs of respiratory distress, no increased work of breathing, normal vitals signs and normal O2 saturations[4,10]

YES

Weaning or discontinuing CPAP:
Before discontinuing CPAP, the infant should be stable on 0.21 Fraction of inspired oxygen (FiO2) and CPAP of 5cm H_2O
Wean CPAP when oxygen SpO2 is consistently above target range and the condition of the neonate is stable.
Dr's order is needed [4,6,10]

Yes

Is the neonate coping on CPAP?
Signs that the infant is tolerating CPAP include no signs of respiratory distress, no increased work of breathing, normal vitals signs and normal O2 saturations[4,10]

No

Troubleshoot

No bubbles (BCPAP): Check system for air leaks

Unsettled infant: Check airway for secretions, assess for pain. incorrect prong size or position.

Prongs cannot be maintained in one place:
Check for appropriate size prongs, hat is a proper fit and tubing is secured [5, 6]

No

CALL DOCTOR OR APN

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