Continuous Positive Airway Pressure (CPAP) in Neonatal Units

- CPAP was first used in 1971. Its use has increased steadily over the last 20 years.
  - It is now the mainstay of ventilatory support for preterm infants.
- Consider extubation of the ventilated infant to CPAP if PCO2 < 8.6 kPa, pH > 7.2, FiO2 < 50%, rate < 20.
- Infants on CPAP without Surfactant administration are at increased risk of Pneumothorax 6-9%.
  - Be aware of this complication and undertake trans-illumination and chest x-ray if the infant has any clinical or blood gas deterioration.
- Nasal prongs cause nasal trauma in 7% of infants.

**CPAP is mostly used for respiratory support in infants with respiratory distress syndrome/apnoea and after extubation in infants with RDS**

**Action:** 1. Splints the upper airway & reduces obstructive apnoea. 2. Prevents alveolar collapse. 3. Reduces respiratory rate via Herring Breuer deflation reflex.

**Administration:** Infant Flow Driver (I.F.D.)

**Clinical Indications:** For infants ≤ 26 wks gest. intubation & surfactant should be considered. For infants 26-30 weeks gest. initial management should be CPAP unless intubation is needed for resuscitation in which case give surfactant. Start Caffeine medication.
  - If infant > 30 weeks gest. commence CPAP if there are signs of RDS.
  - CPAP should be administered after extubation in who have had RDS.

**How to use CPAP:** Apply nasal CPAP using
  - A nasal mask or short binasal prongs. Nasal mask is associated with a lower rate of subsequent intubation.
  - Start PEEP 5 cms increasing to 8 cms if necessary.
  - Intubate if Apnoec, pH < 7.2, PCO2 > 9 kPa, FiO2 > 40%.

**NIPPV** (Neonatal Nasal Intermittent Pos. Press. Ventilation)
  - Mostly in infants after extubation for RDS4. The optimal settings are uncertain. Use PEEP 3-5 cms & PIP 8-15 cms, rate 30/min.

**COIN trial**
- 616 infants 25-28 wks gest randomised to CPAP or intubation.
  - 58% CPAP infants subsequently needed intubation. Pneumothorax rate 9% in CPAP & 3% in intubated group. No difference in death or BPD.

**SUPPORT trial**
- 1316 infants 24-27 wks gest. randomised to CPAP or intubation.
  - 34% CPAP infants subsequently needed ventilation. Pneumothorax rate 7% in both groups.

**CPAP after Extubation- Cochrane review**
- 9 studies found that the use of CPAP significantly reduced the need for reintubation (NNT 6).

**Trial of nasal prongs vs nasal masks**
- Masks had a lower intubation rate prongs 52% mask 28%5.
References:


3. Davis PG, Henderson-Smart DJ. Nasal continuous positive airway pressure immediately after extubation for preventing morbidity in preterm infants. Cochrane database of systematic reviews 2003, issue 2 Art No: CD 000143


This care pathway has been produced by the National Paediatric and Neonatology Clinical Programme. It is aimed at medical, nursing and allied health professionals working in Irish neonatal units.