

## 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  $PCO_2 < 8.6$  kPa,  $pH > 7.2$ ,  $FiO_2 < 50\%$ ,  $rate < 20$ .
- ▶ 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  $\leq 26$  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,  $pH < 7.2$ ,  $PCO_2 > 9$  kPa,  $FiO_2 > 40\%$

**NIPPV (Neonatal Nasal Intermittent Pos. Press. Ventilation)** Mostly in infants after extubation for RDS<sup>4</sup>. The optimal settings are uncertain. Use PEEP 3-5 cms & PIP 8-15 cms, rate 30/min

- ▶ **COIN trial<sup>1</sup>** 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<sup>2</sup>** 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<sup>3</sup>** of 9 studies found that the use of CPAP significantly reduced the need for reintubation (NNT 6).
- ▶ **Trial of nasal prongs v nasal masks showed<sup>5</sup>** masks had a lower intubation rate prongs 52% mask 28%<sup>5</sup>

## References:

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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
4. Owen LS, Morley C, Davis PG. Neonatal nasal intermittent positive pressure ventilation: what do we know in 2007? Arch Dis Child 2007;92:F414-8
5. Kirplani H, Millar D, Lemyre B, Yoder BA, Twomey A et al. A trial comparing noninvasive ventilation strategies in preterm infants. N Engl J Med 2013;369:611-20
6. Kieran EA, Twomey AR, Molloy EJ, Murphy JF, O'Donnell CP. Randomised trial of prongs or mask for CPAP in preterm infants. Pediatr 2012;130:1170-6

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