

High Flow Nasal Cannula (HFNC) Support with Vapotherm

What is HFNC?

HFNC respiratory support is the delivery of humidified, heated and blended oxygen/air at flow rates between 1 and 8 l/min via nasal cannula.

This mode of support can be considered in any infant who you would otherwise consider treating with CPAP. It is in widespread use and is very popular because users perceive that it delivers all of the benefits that can be obtained with CPAP and is easier to deliver, better tolerated by the baby and easier to wean from.

- Small cannulae are used – like those used for low flow O₂
- They are fixed in a similar way to low flow cannulae and don't need a hat
- They do not fit tightly in the nose and do not result in nasal trauma
- High flow into the nasopharynx is well tolerated
- It is fully humidified, quiet, and does not upset the baby
- The high flow results in CPAP. This has been measured and at a flow of 6 l/min is not more than 6cmH₂O
- The high flow is considered to wash out the gas in the nasopharynx meaning that the respiratory dead space effectively starts at the larynx. This improves CO₂ elimination

Uses

- Delivery of warmed, humidified inspired oxygen
- Treating or preventing apnoea of prematurity
- Respiratory support for infants with respiratory disease
- Babies slow to wean off nCPAP
- Babies with nasal trauma from nCPAP

Anecdotal experience is that if the baby is not stable on HFNC then they are unlikely to be any better on CPAP. A small number of babies are sometimes stabilised on BiPAP who could not manage on CPAP or HFNC

Cannula size

- **NB there are specific cannulae for the vapotherm that have short tubing to avoid rain out. Do not use our standard low flow cannulae.**
- Use appropriately sized nasal cannulae
- Cannulae should not obstruct or be larger than ½ the diameter of the nares
- The following is a guide but the diameter of nares vary

Weight	Cannula type	Outer diameter
<1.4 kg	Premature	0.14 cm
1.4- 2.6 kg	Neonatal	0.19 cm
>2.6 kg	Infant	0.27 cm

Settings

- Operating temperature set at 34-35°C for flow rate <5 L/min and 36-38°C at ≥5 l/min
- Start at a flow rate of 4-6 l/min (flow rates >6 L/min in infants <1 kg should be discussed with the consultant)
- Use up to 8 l/min in infants >1 kg
- If the baby is requiring $FiO_2 > 0.4$ or has CO_2 retention, acidosis or apnoea consider alternative support
- Continuous monitoring of heart rate, respiratory rate and SaO_2 , as for an infant on CPAP
- Blood gases if on supplemental oxygen or on clinical grounds

Weaning

- In small babies who are likely to need support for several weeks there is no need to wean initially.
- Weaning is not advised if oxygen requirement is >30%
- In babies who are considered ready to wean the flow rate should be reduced gradually in increments of 0.5 -1.0 l/min
- Do not cycle the babies
- Once the baby is stable on a flow of 2 l/min the baby can be switched to low flow cannulae if supplemental O_2 is still required or just nursed in air if it is not

Contraindications

- Upper airway abnormalities, ventilatory failure, severe cardiovascular instability, frequent apnoeas (despite caffeine in preterms)