Guideline

Use of high flow nasal cannula (HFNC) therapy during neonatal transfers

1 Scope

For use within the Paediatric and Neonatal Decision Support and Retrieval Service (PaNDR) for the East of England.

2 Purpose

To ensure the safe transfer of infants using the HFNC system

3 Definitions and abbreviations

PaNDR	Paediatric and Neonatal Decision Support and Retrieval Service
HFNC	High Flow Nasal Cannula
L/min	litres per minute
CGA	Corrected Gestational Age
nCPAP	nasal Continuous Positive Airway Pressure
LMA	Laryngeal Mask Airway

4 Introduction

HFNC is the delivery of warmed and humidified blended gases at flow rates >1L/min. Various systems of HFNC are available. PaNDR uses the Hamilton ventilator system to provide HFNC

5 Patient use

The PaNDR team will transfer infants who are already on HFNC to a unit which can continue this therapy. For elective transfers, the team will not start HFNC therapy if the infant has not previously been receiving this mode of respiratory support.

For neonatal transfers, should the receiving unit not be able to provide HFNC on admission then it is the referring unit's decision whether they wish to defer the transfer until HFNC is available or change the mode of respiratory support to nCPAP. If the baby is changed onto nCPAP they must have been settled for six hours with a satisfactory blood gas prior to PaNDR agreeing to transfer.

5.1. Criteria for neonatal transfers on HFNC

Single clinician neonatal transfers

Weight	Flow	FiO2	CGA
>1.0kg	6L/min or less	<30%	>28/40

Dual clinician neonatal transfers:

Weight	Flow	FiO2	CGA
>800g	7L/min or less	Stable FiO2 requirements	>27/40

Infant must be stable for at least 12 hours on HFNC mode before transfer

Infants requiring transfer outside of these criteria should be risk-assessed by the clinical team on a case-by-case basis with the rationale clearly documented

6 Setting up HFNC on the Hamilton Ventilator

The HFNC equipment is stored in each ambulance

You will need (*see figure 1*)

- Intersurgical Hydro-guard mini **(1)**
- The Neonatal expiratory valve with diaphragm is NOT **needed (2)**
- Sterilized water for the humidifier **(3)**
- Optiflow Junior Ventilator Circuit Kit **(4)**
- Appropriately sized Optiflow Nasal Cannula Junior (examples shown, in increasing size order, are: XS (blue); premature (red); neonatal (yellow) and infant (purple). **(5)**
- There is **NO** requirement for a pressure line or flow sensor.

figure 1

1. Attach a yellow hydro-guard mini filter to the inspiratory port. Attach the blue inspiratory tubing to the hydro-guard mini filter (*see figure 2*)

figure 2

2. When ready to be used fill the humidifier with the sterile water to the indicated line and turn on (*see figure 3*)

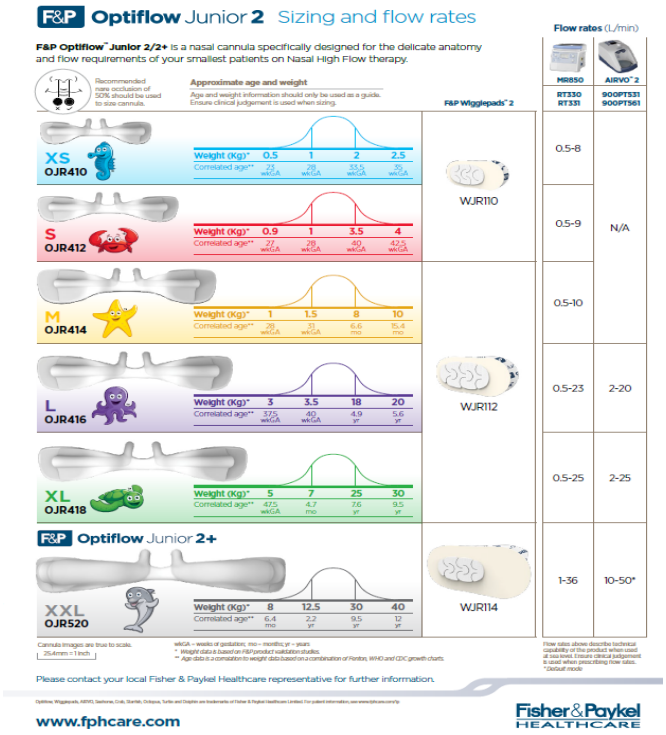
figure 3

3. Attach other end of blue inspiratory tubing from hydro-guard mini filter to one port of humidifier and second blue tubing with patient end to the other port in the humidifier

4. The patient end of the high flow tubing should have the temperature probe from the humidifier attached to it (*see figure 4*)

figure 4

5. Select the appropriately sized Optiflow Nasal Cannula Junior



6. Attach the selected one to the end of the blue tubing (see figure 5)

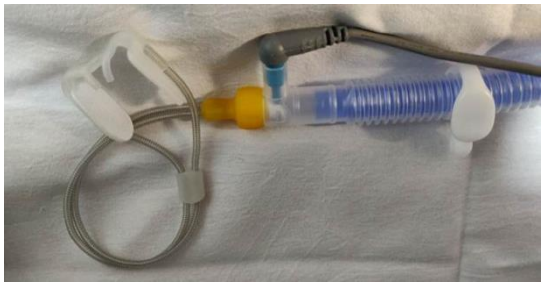


Figure 5

Preop checks for High Flow

- Ensure that 'HFNC' is selected as the mode to be used and then select the 'preop check' button
- The only preop check recommended for High Flow is the **'Leak Test'** (See Picture Guide for the Hamilton T1 Ventilator)
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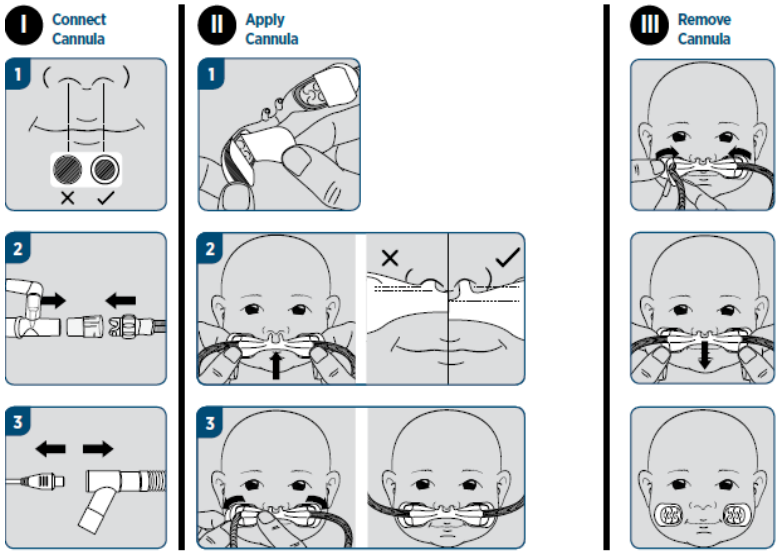
Setting High Flow Parameters

- Ensure HFNC option is selected on the Hamilton
- There is no requirement to set weight in HFNC mode.
- Select the 'Flow' and the 'Oxygen' required
- After each patient, the used Optiflow Junior Ventilator Circuit Kit should be removed a discarded appropriately.

Connecting HFNC circuit to the baby

- The prongs should only fill 50% of the nares. There should be a clear gap around each prong to allow gas to escape, preventing positive distending pressure
- If the infant is between two sizes, then use the smallest size
- Ensure the skin is clean and dry.
- Gently stretch the cannula twice to prevent twisting.
- Remove the first backing pads from the left and right sides of the cannula.
- Fit the cannula into the nares so that the bridge of the cannula sits just below the nasal septum.
- Position horizontally across the face and stick to the skin.
- Remove the second backing and stick the cannula to the cheeks.
- The tubing does not need to go behind the ears and can be placed where comfortable.
- The cannula is secured to the hydrocolloid dressing by Velcro so if any repositioning is required then the dressing does not need to be removed.
- A nasogastric tube can be in situ providing that there is still a visible gap around the nares to allow gas to escape.
- Squeeze the cheeks to replicate a sucking movement and if the prongs dislodge then they will need repositioning.



7 Transferring the baby onto HFNC in neonatal transfers

- Take an update of the baby's clinical condition prior to departure from base including last blood gas. If a blood gas has not been done in the last 12 hours request a repeat blood gas.
- On arrival at the referring unit, take a full handover from the medical/ nursing team and carry out full clinical assessment
- Review gases and observation chart for the last 24 hours
- Any concerns discuss with the PaNDR consultant on call
- If you are happy with the clinical condition then transfer the baby onto the HFNC system with the gas flow and FiO_2 on the same settings as they are currently receiving, irrespective of the device they are on
- Discuss with the PaNDR consultant/transport doctor whether infant's clinical condition requires TCO2 monitoring during transfer.
- If the baby's respiratory effort and/or oxygen requirement increases then increase the gas flow in one litre increments up to a maximum of 8L/min until the baby has settled and if needed, increase the FiO_2. Allow the baby to settle for 20 minutes in the incubator and then reassess the respiratory status including blood gas (if needed) and discuss with the PaNDR consultant
- If any changes have been made, when the baby is settled reduce the oxygen first as the condition allows followed by the flow.
- Keep parents informed of any changes as appropriate.

- At the receiving unit, if required, perform a blood gas prior to transferring the baby to the unit incubator
- A blood gas is not necessary for all babies on HFNC, a blood gas should be performed on babies who have had a clinical deterioration during transfer, a gas should be considered for babies who are on a flow of >6l/min, FiO2 of >30% and/or babies who are <28 weeks corrected.

7.1. Monitoring

- Be aware HFNC set up will <u>not alarm</u> if there is a displacement or disconnection of the circuit.
- Continuous ECG & $Sp0_2$ monitoring must be used
- Document baseline observations prior to transfer
- Document observations at 15 minutes intervals throughout the transfer

7.2. Clinical deterioration during transfer

- Ask the driver to stop the ambulance in a safe place
- Carry out a clinical assessment
- Check correct placement of the nasal cannula
- Clear any secretions & suction if required

- Ensure there are no leaks in the circuit and that the circuit has not disconnected
- Ensure the cannula are patent
- If the respiratory condition has worsened, increase FiO_2 and then flow rate and assess the response. Consider performing a blood gas
- Call the PaNDR consultant and update them on the clinical condition and changes you have made
- The PaNDR consultant will help to guide further actions depending on clinical response e.g. changing to CPAP, reconsidering destination, insertion of LMA or endotracheal tube. the PaNDR team may consider whether to go back to the referring hospital, divert to a nearer hospital or continue with increased respiratory support
- Keep referring unit, receiving unit and parents informed
- Document events

8. Monitoring compliance with and the effectiveness of this document

Audit standards:
The PaNDR team will monitor compliance with this document by undertaking regular audits which will be reported back to the consultants and lead nurse.

The effectiveness of the document will be monitored by review of any reported incidents by the lead consultant and nurse for risk

References

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- Fisher & Paykel. Optiflow Junior fitting guide [internet]. 2013.

Associated documents

- Picture Guide for the Hamilton T1 Ventilator (PaNDR Internal Share Drive)

Equality and diversity statement

This document complies with the Cambridge University Hospitals NHS Foundation Trust service equality and diversity statement.

Disclaimer

It is the responsibility of all staff to ensure they are using the latest version of a document.

Document management

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