

LRI Emergency Department

Standard Operating Procedure for:

Use of Humidified High Flow Nasal Oxygen (HHFNO) in infants with Bronchiolitis

Staff relevant to:	ED medical and nursing staff
ED senior team approval date:	
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Use of Humidified High Flow Nasal Oxygen (HHFNO) in infants.

High Flow Humidified Oxygen is an evolving treatment modality for children with respiratory distress. This SOP should only be utilised with senior nurse or doctor approval as evidence for the effectiveness of HHFNO is mixed.

Key Points

There is evidence HHFNO may be beneficial in infants with bronchiolitis and other respiratory conditions.

This SOP is written for children with bronchiolitic symptoms and doctor-in-charge approval required if use in other conditions is being considered

Suitable for HHFNO

Infant has at least moderate severity as per bronchiolitis SOP

FiO₂ > 0.5 to maintain Sats > 90%

Increasing heart and respiratory rate in context of moderate/severe recession

Not suitable for HHFNO

Evidence of life threatening symptoms:

- Imminent Respiratory Collapse
- Apnoea requiring intervention
- Grunting

Absolute Contra-indications:

- Pneumothorax
- Upper airway abnormalities

These infants need immediate senior review (+/- CPAP/Airway support asap)

Set up HHFNO equipment (see next page and quick reference guide attached the vapo therm machine)

HHFNO is an Aerosol Generating Procedure (AGP) so the patient will need to be managed in the Emergency Room or in HDU bay 14

Initial Management

Flow should be initially set at 1-2L/kg/min (but a minimum of 5L)

Temperature should be set at 37.0 °C

Oxygen should be set at 40% - HHFNO aids work of breathing and oxygen transfer but it will not improve oxygen saturations if no additional oxygen is delivered.

Monitor patients POPS every 15 minutes for first hour

Medical review if deterioration in work of breathing, oxygen requirements or alertness

Please complete the HHFNO audit form (end of this SOP)

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This guidance supplements the Vapotherm Pocket Guide which is attached to the machine

Fitting Cannula:

Ensure not to occlude more than 50% of the nostril i.e. a tight seal is NOT needed. There are no other sizing criteria; common sense should be used.

The solo cannula is specifically designed for infants and works as efficiently as a double pronged cannula.

When sizing the nasal cannula's and considering ensuring < 50% nasal occlusion, consideration needs to be given to the space occupied by the NG tube. Consider using the solo cannula, or reducing cannula size if necessary.

Adjust flow rate:

Initial flow rate should be 1-2L/kg/min. This should be adjusted according to patients condition and FiO₂. It takes approximately 2-3mins for the patient to adjust to change in flow rate

Alarm:

Alarms are set internally and can not be changed

Controls:

All controls are set by the central dial (see pocket guide and set up sheet)

Power supply:

This machine has a minimal battery life and should not be used for transfer

Ongoing Care

The flow rate may be adjusted above 2L/kg/min but only with consultant authorisation. HHFNO should be discontinued if there is no obvious clinical improvement or any evidence of deterioration.

Please record the machine's FLOW RATE, TEMP and OXYGEN settings prior to transfer to HDU as they will need this information

Turn over for Audit Priorities and References

Use of Humidified High Flow Nasal Oxygen (HHFNO) in infants.

Ongoing Management

Please refer to the Children's Hospital guidance for escalation or weaning strategies although the ability to wean within the ED would indicate either it wasn't necessary to begin with or capacity issues dictate the child remains in the department beyond 4 hours.

[http://insitetogether.xuhl-tr.nhs.uk/pag/pagdocuments/Heated%20Humidified%20High%20Flow%20Nasal%20Cannula%20Treatment%20\(HHFNFC\)%20UHL%20Childrens%20Intensive%20Care%20Guideline.pdf](http://insitetogether.xuhl-tr.nhs.uk/pag/pagdocuments/Heated%20Humidified%20High%20Flow%20Nasal%20Cannula%20Treatment%20(HHFNFC)%20UHL%20Childrens%20Intensive%20Care%20Guideline.pdf)

Audit Priorities

Please complete the HHFNO audit form for all patients

References

Web-based resources

Below is an on-line version of the Vapotherm Precision Flow In Service Video (bottom middle link on the internet page) and a webinar on the 'Clinical Application of High Flow Therapy in the Treatment of RSV Bronchiolitis'.

<http://www.vtherm.com/webinars/>

Further evidence based reading

<https://dontforgetthebubbles.com/paris-in-the-autumn/>

<https://dontforgetthebubbles.com/high-flow-controversy-return-ticket-paris/>

First-line oxygen therapy with high-flow in bronchiolitis is not cost saving for the health service

<https://pubmed.ncbi.nlm.nih.gov/32276987/>

Vapotherm High Flow Therapy Audit Form



Date: _____

S Number: _____

Patient Age: _____

Diagnosis (Circle all that apply): Bronchiolitis Asthma Pneumonia

Initial Observations

Heart Rate: Respiratory Rate: Oxygen Requirement:

Bronchiolitis Score (see next page):

Observed Performance (Tick the relevant box):

	5	4	3	2	1
Patient respiratory response	Excellent		Adequate		Insufficient
Frequency of technical or clinical difficulties	Never		Occasional		Frequent
Patient comfort and tolerance of therapy	Excellent		Adequate		Insufficient
Simplicity of set-up and use	Simple		Typical		Complex
Monitoring and support of therapy required (adjustments, refilling fluids, adjusting interface)	Minimal		Typical		Frequent

Observations on Discharge

Heart Rate: Respiratory Rate: Oxygen Requirements

Bronchiolitis Score (see next page):

Disposition (Circle one) Ward _____ HDU PICU Other: _____

Any Other Comments:

Please record the machines Flow Rate, Temperature & Oxygen Levels prior to transfer as this information will be needed by the inpatient team.

Bronchiolitis Score (Lui 2004)

	0	1	2	3
Respiratory Rate	0-6 mo < 50 6mo – 1yr < 40 1 yr+ < 30	0-6 mo < 60 6mo – 1yr < 50 1 yr+ < 45	0-6 mo < 70 6mo – 1yr < 60 1 yr+ < 60	0-6 mo > 70 6mo – 1yr > 60 1 yr+ > 60
SaO2	≥ 90 %	≥ 88 %	≥ 86 %	≤ 85 %
General Appearance	Calm No distress	Mildly irritable; easy to console	Moderately irritable; difficult to console	Extremely irritable; cannot be comforted
Number of Features of Flare or recession: -Nasal Flare -Suprasternal -Intercostal -Subcostal	None	1 of 4	2 of 4	3 or more
Auscultation	Clear	Scattered wheezes	Diffuse expiratory wheezing	Biphasic wheezing or very poor air movement