



Humidified High Flow Nasal Cannula Therapy Procedure - Acute Paediatric

Effective: 9 July 2019

1. Guiding Principles

This procedure outlines the indications, management and process for the use of Humidified High Flow Nasal Cannula Therapy (HHFNC) in paediatric patients within Emergency Department (ED), High Dependency Unit (HDU) and the Paediatric Ward at the Albany Health Campus.

HHFNC may be commenced on paediatric patients with bronchiolitis and acute respiratory failure.

The administration of oxygen and/or air via Humidified High Flow Nasal Cannula (HHFNC) is a recognised, safe and non-invasive method of delivering Positive End Expiratory Pressure (PEEP) in infants and children with respiratory disease or illness.

This document (procedure) pertains to and governs the use of HHFNC on infants and children in Albany Hospital. HHFNC therapy is a medically ordered mode of respiratory support.

It is important to note that HHFNC therapy is technically not a form of Continuous Positive Airway Pressure (CPAP), as the nares are not fully occluded.

Patients who are placed on HFNP are to be considered for transfer to the Perth Children's Hospital (PCH), if the patient does not exhibit signs of achieving clinical goals within 2 hours of commencement of HHFNC therapy.

The patient is to be managed in the most clinically appropriate unit, with access to paediatric experienced doctors and nurses. In the event of non-response, continuous positive airway pressure (CPAP) should be considered.

Normal escalation processes are to be followed as per local Paediatric Observation and Response Escalation and Medical Emergency Response and MER protocols.

2. Procedure

2.1 Indications

2.1.1 Respiratory Distress related to bronchiolitis

- Consider if hypoxemia and moderate to severe respiratory distress despite standard oxygen therapy via Hudson mask or nasal prongs.

2.1.2 Acute Respiratory Failure

- In addition to bronchiolitis, HHFNC may be considered in infants and children with acute respiratory failure from other causes; however there is minimal evidence based data for use other than bronchiolitis.

2.2 Contraindications

Contraindications include:

- blocked nasal airways e.g. choanal atresia
- trauma or surgery to nasopharynx
- pneumothorax
- base of skull fractures.

2.3 Possible Complications

- Gastric distension – consider nasogastric tube
- Pressure areas to the nostrils or face due to the device
- Blocked HFNP tubing related to patient secretions which will impact oxygen and flow delivery
- Pneumothorax
- Physiological effects of positive pressure body systems relating to the increase in the intra-thoracic pressure and the physical aspects of the device.

2.4 Commencing of Therapy

- Medical order to commence therapy or to alter flow must be documented by the medical officer in the patient's notes. A medical officer must review the child within 30min-1 hour of commencing therapy to gauge efficacy of the therapy
- A purple oxygen prescription sticker is required in medication chart
- Therapy should be commenced at 2L/kg/min for patients up to 15 kg, for patients 16 kg and above follow the rate set in table below

Childs Weight	Recommended Flow rate	Max Flow rate	Circuit required
3-12 kg	2 L/kg/min	Max 25 L/min	Paediatric circuit
13-15 kg	2 L/kg/min*	Max 30 L/min	Adult circuit
16-30 kg	35 L /min*	Max 40 L/min	Adult circuit
31-50 kg	40 L /min*	Max 50 L/min	Adult circuit
>50 kg	50 L /min*	Max 50 L/min	Adult circuit

* To improve tolerance, increase flow to this rate over 2 minutes

2.5 Documentation

Minimal documentation must include:

- vital signs and respiratory assessment – 15 minutely for 1 hour, then 30 minutely for 2 hours, and then hourly using the age appropriate Paediatric Observation Respiratory Chart
- hourly HFNP observation including: flow rate, FiO₂ and humidifier temperature as per [WACHS MR142 Neonatal / Paediatric Respiratory Observation Chart](#)
- medical orders for HFNP flow rates and FiO₂ at the commencement of therapy and for any changes in orders. These must be documented on the purple oxygen sticker in the medication chart (as per the [WACHS Oxygen Therapy and Respiratory Devices – Adult Clinical Practice Standard](#) [Appendix 1: Oxygen therapy management – oxygen prescription and dose section]).

2.6 Patient Transport

- should be undertaken by staff who fully understanding the patient risks and the skills to troubleshoot equipment and patient scenarios, especially on transfers outside of the hospital environment
- Patients are to be monitored continuously during any transfer - visual observation, saturations, RR and HR as a minimum.

2.7 Weaning HHFNC

As patients improve, their oxygen requirement decreases. Oxygen is potentially harmful, especially if the inspired concentration is inappropriately high. **Oxygen is not a treatment for increased work of breathing.** Every effort should be made to adjust to the lowest possible FiO₂ to achieve target oxygen saturations.

- It is not necessary to wean flow rate, with every set of observations, attempt to wean FiO₂ as follows:
 1. If SpO₂ ≥ 92% decrease FiO₂ by 10 percent and observe closely for 10mins to ensure SpO₂ remains ≥92%.
 2. If SpO₂ falls below 92% return to previous FiO₂. With the following set of hourly observations, attempt further wean and reassess.
 3. Once the patient has been stable in FiO₂ of 21% for one hour i.e. no respiratory distress discontinues off HHFNC.

Observe for 30mins, if work of breathing increases significantly or SpO₂ falls below 92%, consult with patient's medical team to decide on further action (re-initiation of HHFNC versus low flow nasal prong oxygen).

3. Definitions

CPAP	Continuous Positive Airway Pressure
HFNP	High Flow Nasal Prongs
HDU	High Dependency Unit
ED	Emergency Department
FiO₂	Fraction of Inspired Oxygen
PEEP	Positive End Expiratory Pressure
PCH	Perth Children's Hospital
Responder	A responder is a patient who demonstrates a reduction in either their respiratory rate and/or heart rate by 20% of their worst recorded observations within 30 minutes of commencing therapy.
Non-Responder	Consultation and referral to PCH recommended

4. Roles and Responsibilities

All staff are required to work within policies and guidelines to make sure that WACHS is a safe, equitable and positive place to be.

5. Compliance

Failure to comply with this policy may constitute a breach of the WA Health Code of Conduct (Code). The Code is part of the [Employment Policy Framework](#) issued pursuant to section 26 of the [Health Services Act 2016](#) (HSA) and is binding on all WACHS staff which for this purpose includes trainees, students, volunteers, researchers, contractors for service (including all visiting health professionals and agency staff) and persons delivering training or education within WACHS.

WACHS staff are reminded that compliance with all policies is mandatory.

6. Records Management

[Health Record Management Policy](#)

7. Evaluation

Monitoring of compliance and review of this document is to be carried out by the Clinical Nurse Manager - Medical/Paediatrics, Clinical Nurse Specialist - High Dependency and Medical Lead - High Dependency Unit every two (2) years.

8. Standards

[National Safety and Quality Health Service Standards](#)

Recognising and Responding to Acute Deterioration Standard – 8.1

9. References

Rockingham Peel Group. [High Flow Nasal Cannula Therapy – Paediatric \(Acute\) Guideline](#) [Internet] 2016 (Accessed: 01 May 2019)

[PCH Observations, including Respiratory Assessment Procedure](#)

10. Related Forms

[MR142 WACHS Neonatal/Paediatric Respiratory Observation Chart](#)

[MR140D Newborn Observation and Response Chart \(N-ORC\)](#)

[MR140I Paediatric Observation and Response Chart \(P-ORC - 12+ years\)](#)

11. Related Policy Documents

[WACHS Clinical Escalation of Acute Physiological Deterioration including Medical Emergency Response Policy](#)

[WACHS Oxygen Therapy and Respiratory Devices – Adult Clinical Practice Standard](#)

[PCH Humidified High Flow Nasal Cannula Therapy Guideline](#)

12. WA Health System Policies

MP 0086/18 [Recognising and Responding to Acute Deterioration Policy](#)

13. Appendix

Appendix 1: [Paediatric Humidified High Flow Nasal Prong Therapy Flowchart](#)

This document can be made available in alternative formats on request for a person with a disability

Contact:	Clinical Nurse Manager, Medical / Paediatric Ward (Vicki. Charters)		
Directorate:	Nursing and Midwifery Services	TRIM Record #	ED-CO-17-53867
Version:	2.00	Date Published:	9 July 2019

Copyright to this material is vested in the State of Western Australia unless otherwise indicated. Apart from any fair dealing for the purposes of private study, research, criticism or review, as permitted under the provisions of the *Copyright Act 1968*, no part may be reproduced or re-used for any purposes whatsoever without written permission of the State of Western Australia.

Appendix 1: Paediatric Humidified High Flow Nasal Prong Therapy Flowchart

