



Neonatal and Paediatric Continuous Positive Airway Pressure Guideline

1. Guiding Principles

The King Edward Memorial Hospital (KEMH) and Princess Margaret Hospital (PMH) clinical guidelines for continuous positive airway pressure (CPAP) are mostly specific to the very preterm neonate; those with chronic lung disease and the Hudson nasal prong delivery device.

For the above reasons, the WA Country Health Service (WACHS) endorses the Queensland Department of Health Maternity and Neonatal Clinical guideline for [Neonatal Respiratory Distress including CPAP](#) for both neonatal and paediatric Bubble CPAP therapy.

The WACHS specific information that differs to the Queensland Health clinical guideline is outlined in [section 2.5](#).

Neonatal and Paediatric Bubble CPAP should only be undertaken at WA Health Clinical Service Framework Level 4 (Level 2a licensed Special Care Nursery neonatal unit) sites with 24/7 paediatric medical practitioner cover.

Neonatal retrieval and Neonatologist advice is to be via NETSWA. Paediatric retrieval is to be via RFDS. The Kimberley and Pilbara regions provide their own neonatal retrieval services.

2. Guideline

Sites Bubble CPAP endorsed	Neonatal	Paediatric - age limit
Bunbury	Yes	Paediatrician discretion
Broome	Yes	Up to 18 months
Geraldton	Yes	Paediatrician discretion
Kalgoorlie	Yes	Up to 18 months
Hedland Health Campus	Yes	Up to 6 months

Sites providing CPAP services must have a CPAP competent nurse or Midwife rostered for the duration of the CPAP therapy, with a Paediatrician (or Paediatric qualified Nurse Practitioner) available by close on-call (within 30 minutes) 24/7 (Note: Bunbury Hospital only - Paediatrician to remain on site (or within 10 minutes) during CPAP).

2.1 Clinical indications for CPAP therapy

- While awaiting transfer to a tertiary service (under direction of NETSWA)
- For the short term management of respiratory distress (12 – 24 hours) where the infant is stable and the outcome of therapy is predictable (i.e. TTN)
- For longer term management of uncomplicated respiratory distress where the therapy is clearly beneficial with evidence of clinical improvement
- Where there is no improvement in clinical condition within 4 - 6 hours of commencing CPAP, then consideration should be given to tertiary transfer after discussion with:
 - NETS (WA) for neonates
 - a consultant paediatrician for infants.

2.2 Special circumstance – CPAP awaiting retrieval

- Maternity sites without a licensed Special Care Nursery may provide neonatal CPAP therapy while awaiting retrieval in the following circumstances only:
 - under direction of NETSWA
 - if a competent registered nurse (RN) or midwife is available to provide direct care
 - if the obstetric doctor (or paediatric qualified nurse practitioner) is available within 10 minutes.

2.3 Medical CPAP prescription

- In line with the WA Health [Use of Acute Oxygen Therapy in Western Australian Hospitals](#) using the WA Health Oxygen Prescription sticker on the National Inpatient Medication Chart (NIMC) – see [Appendix 2](#).
- Any changes or alterations in flow, CPAP (pressure), oxygen concentration or temperature must be authorised and prescribed by the paediatric medical practitioner (or paediatric qualified nurse practitioner) using the Oxygen Prescription sticker on the NIMC.
- Parameters for weaning must likewise be prescribed by the paediatric medical practitioner (or paediatric qualified nurse practitioner).
- Midwives and nurses are to sign for the oxygen administration on the NIMC each shift.

2.4 Midwifery / Nursing staffing

- A minimum staffing ratio of 1: 2 for stable infants.
- Clinically unstable infants may require 1:1 care as documented by the treating Paediatric doctor.
- Newborns are to be cared for in the licensed SCN.
- Infants are to be cared for on the paediatric ward, or in the High Dependency Unit, dependent on clinical indications /condition.

2.5 Equipment set up

- As per [Appendix 1](#).

2.6 Differences for WACHS to the Queensland Health Clinical Guideline for Neonatal Respiratory Distress ‘Principles of Care’

- **Blood cultures, antibiotics and blood glucose:**
 - As per relevant KEMH (newborn) or PMH (infant) clinical guidelines
- **X-Ray review**
 - Is to be undertaken by the on-call paediatrician.
- **Pressure injury prevention**
 - Document on the modified [MR124A WACHS Glamorgan Pressure Injury Risk Assessment](#).

2.7 Professional development requirements

Midwives and nurses caring for infants receiving CPAP are required to have successfully completed the Queensland Health Clinical Learning Resource for Neonatal Respiratory Distress including CPAP (or receive recognition of prior learning). This is available via the WACHS Learning Management System.

3. Definitions

CPAP	Continuous Positive Airway Pressure
CSF	Clinical Services Framework
KEMH	King Edward Memorial Hospital
NETSWA	Neonatal Emergency Transport Service (WA)
NIMC	National Inpatient Medication Chart
PMH (PCH)	Princess Margaret Hospital (Perth Children's Hospital)
RFDS	Royal Flying Doctor Service
SCN	Special Care Nursery
TTN	Transient Tachypnea of the Newborn

4. Roles and Responsibilities

Bubble CPAP therapy may only be undertaken by nurse practitioners, midwives, registered or enrolled nurses and paediatric medical practitioners who have:

- completed an appropriate training program
- maintained annual recency of practice
- familiarised themselves with this policy.

5. Compliance

Failure to comply with this guideline 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. Evaluation

Monitoring of compliance with this document is to be carried out by the relevant ward manager (or delegate) three months following implementation and then locally as indicated thereafter.

7. Standards

[National Safety and Quality Healthcare Standards](#) (First edition 2012) - 9.1.1, 9.1.2, 9.2
[National Safety and Quality Healthcare Standards](#) (Second edition 2017) - 8.1, 8.2

8. References

Fisher & Paykel Healthcare Product Literature. [Bubble CPAP System Set-up Guide](#). 2011. Accessed 06 September 2016

[Queensland Health Clinical Learning Resource Neonatal Respiratory Distress including CPAP](#) (v. 2 January 2015)

Women's and Newborns Health Network. [Framework for the care of neonates in Western Australia](#). Department of Health, March 2009. Accessed 20 August 2016.

9. Related Forms

[MR140D WACHS Newborn Observation and Response Chart](#)

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

[MR124A WACHS Glamorgan Paediatric and Neonatal Pressure Injury Risk Assessment form](#)

10. Related Policy Documents

WACHS [Medication Administration Policy](#)

WACHS [Maternity and Newborn Services Policy](#)

Princess Margaret Hospital for Children, Clinical Practice Manual [Bubble CPAP \(Continuous Positive Airway Pressure\)](#) (January 2018).

King Edward Memorial Hospital, Neonatology Clinical Guidelines. [Continuous Positive Airway Pressure](#) (October 2016)

11. WA Health Policy Framework

[WA Health Clinical Services Framework 2014-2024](#)

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

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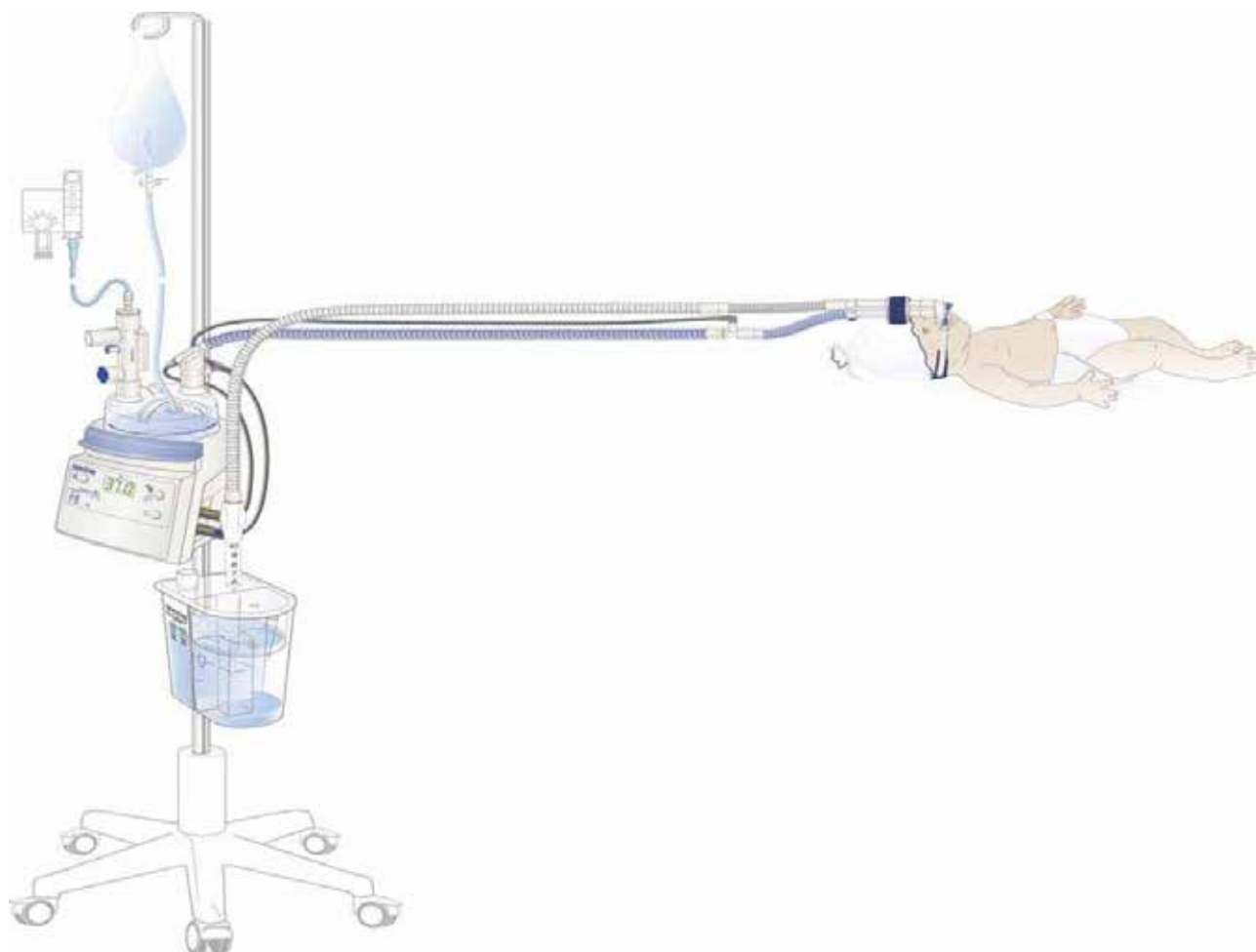
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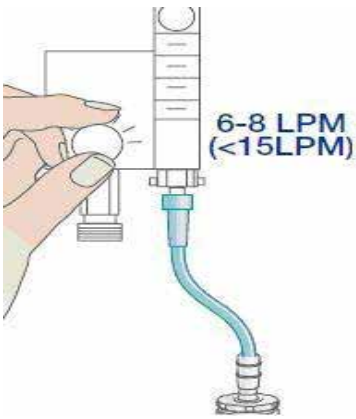
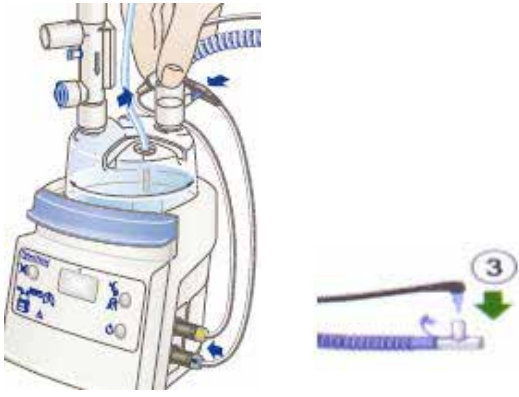


Appendix 1 – Equipment Set Up


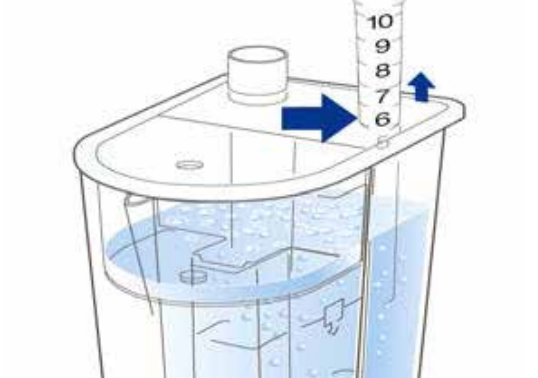
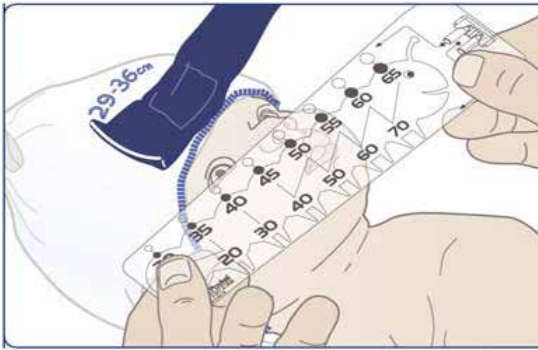
FISHER AND PAYKEL EQUIPMENT

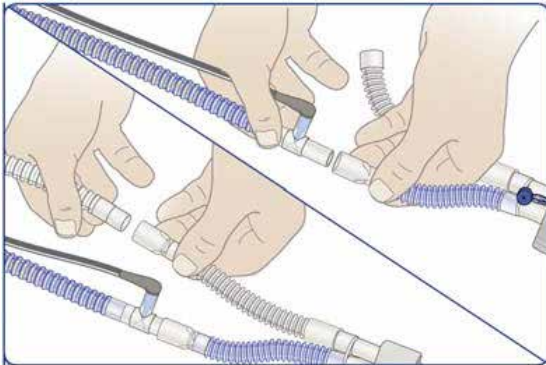

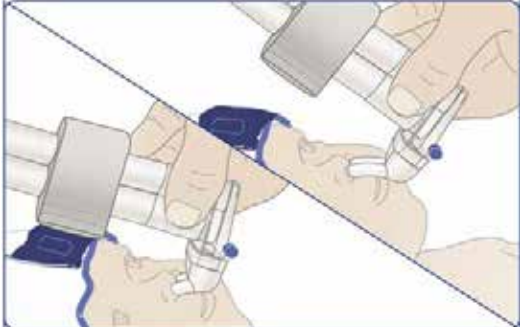
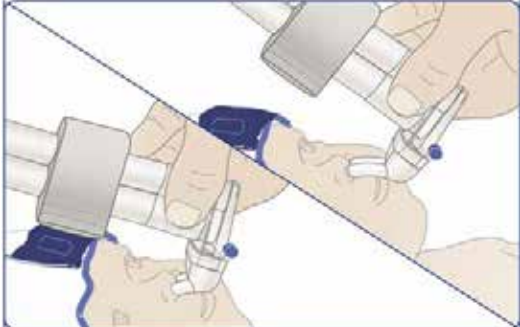
- Oxygen source, with 2-way adaptor, and 1 high-flow regulator
- Medical air source (no flow regulator required) IV pole, with MR850 humidifier base unit attached
- Air/Oxygen blender with flow metre, plus accompanying wires
- Nasal Prong or Infant Nasal Mask of appropriate size
- Infant Head Gear (to secure tubing)
- Chin Strap if indicated
- Nasal Tubing (*snorkel device*)
- BC161-10 Bubble CPAP System including humidification chamber, pressure manifold, circuit consisting of blue / white limbs and a CPAP generator with funnel.
- Length of oxygen tubing
- Sterile bottle of Water for Irrigation (1 litre)
- 1 litre bag of Water for Injection
- Mobile overhead warmer or isolette (if indicated)

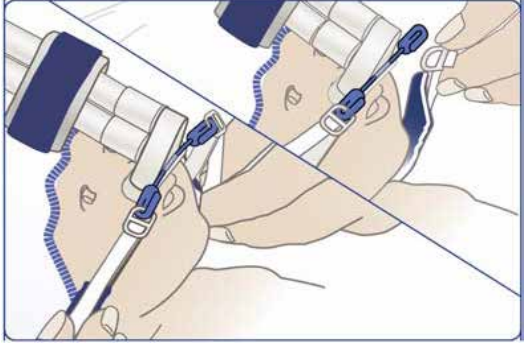


	Procedure	Comment
1	Attach the MR850 humidifier unit and the blender to the IV pole, if not already done	
2	Attach the two way adaptor to the oxygen source, and then connect a standard flow meter to one of the outlets on this adaptor	This provides a high flow oxygen source for use in an emergency
3	Connect the oxygen (white) and air (black) hoses from the blender to the gas supply. A screeching noise from the blender unit may be heard as the hoses are connected. This is the 'disconnect alarm' and is normal during set-up	A persisting screeching noise after the hoses have been connected to the gas sources indicates that the hoses have not been correctly attached
4	Assemble all equipment	Note: The Bubble CPAP and HHFNC circuits are NOT interchangeable
5	Slide the humidification chamber onto the base unit, remove the blue caps and unwind the water feed set Ensure the base unit is positioned below the level of the infant (so that any condensation will drain away from the patient)	
6	Spike the bag of sterile water using the water-feed set. Ensure this is positioned at least 50cm above the humidification chamber. The chamber will automatically fill with water from the bag	
7	Connect the pressure manifold (1) to one of the two 'ports' on the chamber Connect the elbow of the blue inspiratory limb (2) to the second of the two 'ports' on the chamber	

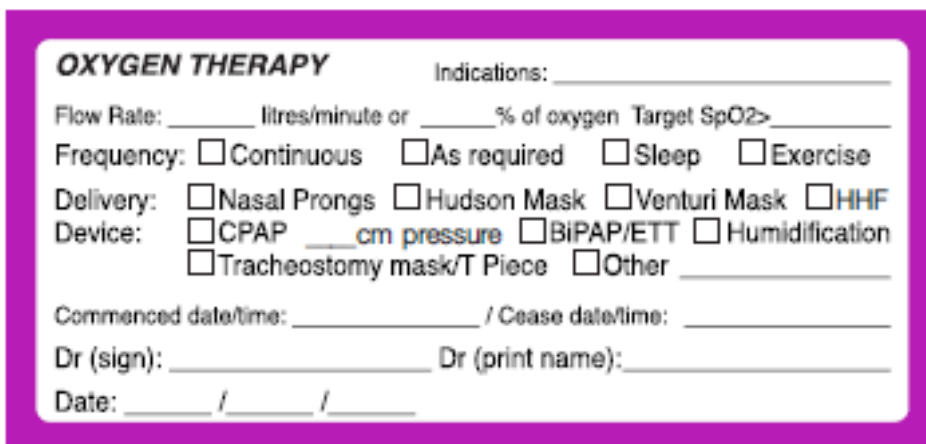
	Procedure	Comment
8	Connect the blender with the manifold, using the piece of oxygen tubing	
9	<p>Connect the blue temperature probe plug into the blue socket on the side of the humidifier</p> <p>Securely insert the blue twin probe into the breathing circuit elbow above the circuit</p> <p>Insert the temperature probe into the port at the patient end of the circuit (3)</p>	
10	<p>(1) Connect the yellow heater wire adaptor plug into the yellow socket on the side of the humidifier</p> <p>(2) Connect the clover leaf end into the socket on the breathing circuit elbow above the chamber</p>	
11	<p>Fill the CPAP generator to the line with 500mls of water for irrigation via the funnel provided.</p> <p>Do not overfill</p>	

	Procedure	Comment
12	Connect the clear expiratory circuit to the CPAP manometer	
13	Attach the CPAP generator to the back of the pole (using the C clamp or basket)	
14	Adjust the CPAP manometer to required pressure (cmH ₂ O) as ordered by the medical officer Typical pressures prescribed range from 5-8cmH₂O, and must be medically ordered and double checked prior to commencement	
15	Prongs: Determine the correct size nasal prong size using the sizing guide (see below). The prongs should create a seal at the nostrils, but not cause blanching Mask: Choose the appropriate size mask (S, M, L, XL) which covers the whole nose without blanching	
16	Attach the correct sized prong or mask to the nasal tubing, by pushing it firmly into the block on the end of the snorkel	

	Procedure	Comment
17	Connect the circuit tubing to the two pieces of tubing on the snorkel device	
18	Set the blender dial to the required oxygen percentage (as per medical order)	
19	Set the flow rate on the flow metre (as per medical order) This is usually 6-8 litres/min	
20	Occlude the nasal prong and confirm that there is bubbling in the chamber	The presence of bubbling confirms correct operation, and the absence of leaks in the system. If no bubbling occurs, check the system for leaks
21	Turn on the humidifier. It will automatically default to “invasive mode” (37 degrees). This is the correct setting and should not be altered	The temperature display on the humidifier base will with fluctuate between 35-40 degrees (this is normal) to achieve optimal patient humidity.
22	Measure the infants head, and chose the correct size head gear. Place head gear under nape of the neck, so that the occiput fits into the hole.	
23	If using the prongs , insert the nasal prongs curve down (downward arch) into the nares. Ensure there is a 2mm gap between the prongs and the septum. If using the mask , place it snugly over the nose	
24	Ensure the foam block on the snorkel sits centrally on the forehead. Secure the block in place by folding over the head gear straps.	

	Procedure	Comment
25	Hook the clips from the side straps of head gear to the glider. Pull both straps at the same time to secure the prong, and fasten to the head gear with the Velcro.	
26	Using the labels provided in the packaging, date / sign when the circuit is due for changing and adhere it to the chamber	

Appendix 2: Updated WA Health Oxygen prescription sticker
(WACHS IPROC order number: **145100B**)



OXYGEN THERAPY Indications: _____

Flow Rate: _____ litres/minute or _____ % of oxygen Target SpO₂> _____

Frequency: Continuous As required Sleep Exercise

Delivery: Nasal Prongs Hudson Mask Venturi Mask HHF

Device: CPAP _____ cm pressure BiPAP/ETT Humidification
 Tracheostomy mask/T Piece Other _____

Commenced date/time: _____ / Cease date/time: _____

Dr (sign): _____ Dr (print name): _____

Date: ____ / ____ / ____