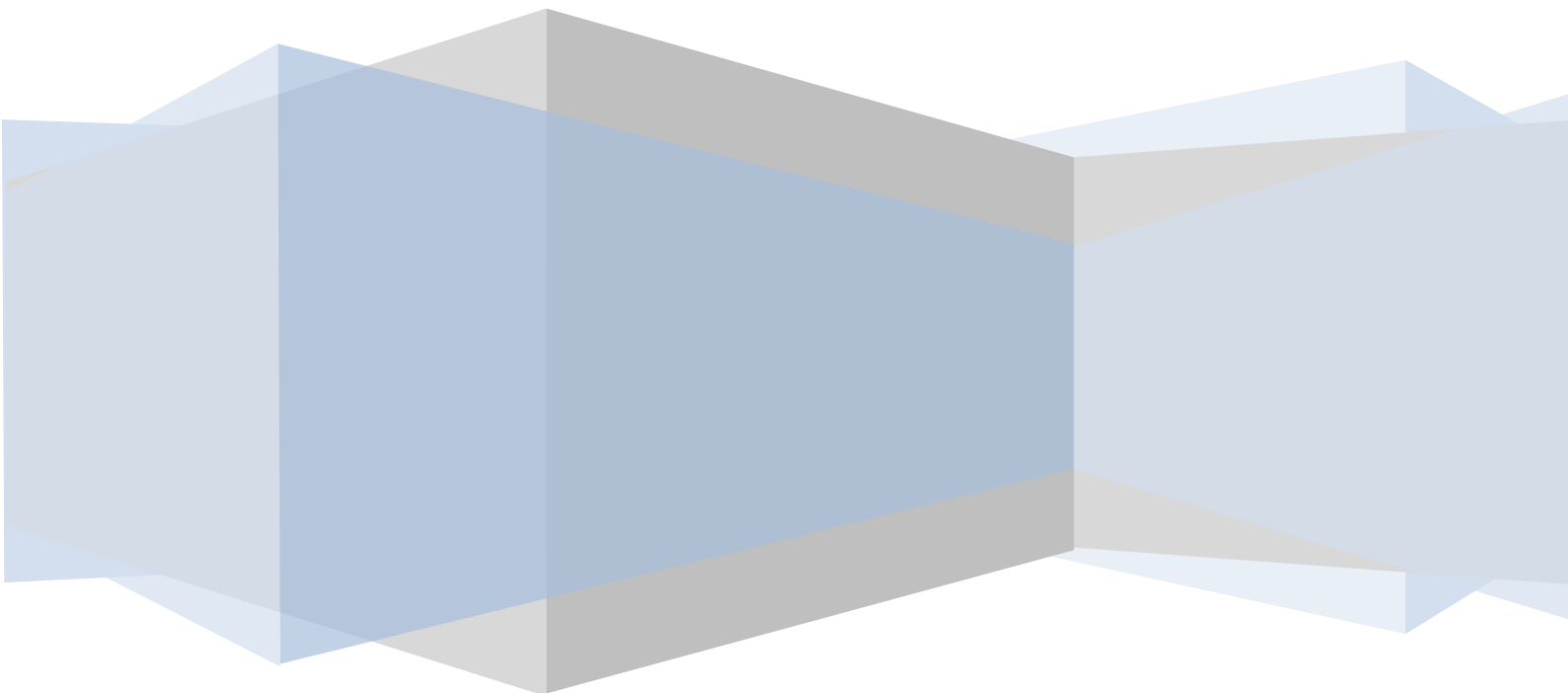


# PIPER-Neonatal Education learning resource package and competency based assessment for nasal CPAP in level 2 special care nurseries in Victoria

**Developed by PIPER–Neonatal  
Education Victoria**

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## Overview of the learning resource

This clinical learning resource package has been designed to assist nursing staff (registered nurses and midwives) working in non-tertiary level 2 (L2) special care nurseries in Victoria. The focus of the resource package is nasal continuous positive airway pressure (NCPAP). Upon completion of this learning package the participant will be able to:

- Manage the nursing care of a neonate experiencing respiratory distress
- Identify risk factors for developing respiratory distress and anticipate the need for intervention
- Recognise the need to initiate NCPAP adhering to the Victorian state-wide NCPAP guidelines
- Provide care and management to the neonate on NCPAP
- Know when a PIPER referral is indicated for a neonate on NCPAP in a level 2 SCN in Victoria

## Objectives for learning resource

- Develop an understanding of respiratory distress in neonates
- Identify the signs and symptoms of a neonate with respiratory distress
- Identify different reasons why a neonate may develop respiratory distress
- Understand what NCPAP is and why its use is indicated
- Demonstrate competent use and troubleshooting of the NCPAP equipment relevant to the individual's workplace
- Demonstrate familiarity of the PIPER publication – 'Guideline for the Administration of nasal CPAP in Victorian non-tertiary Level 2 nurseries' 2013.
- Demonstrate competence and confidence in nursing care of a neonate on NCPAP

# **Respiratory Distress**

Respiratory disease may be defined as 'a progressive impairment of the lungs to exchange gas at the alveolar level' (Gardner et al, 2011, pg. 584). The pathologic process of causing respiratory disease may come from any part of the respiratory system or other organ systems such as the cardiovascular and neurological systems in the neonate. The final common pathway will result in impaired gas exchange (Gardner et al, 2011, pg. 584). This will then cause the neonate to display signs of respiratory distress.

Respiratory distress is a general term used to describe respiratory symptoms. It is not the same as 'respiratory distress syndrome' or 'hyaline membrane disease (Levene et al, 2008, pg. 92). This is a disease process that can cause infants to display signs of respiratory distress.

## **Signs of Respiratory Distress in Neonates**

### **Tachypnoea**

Tachypnoea is a respiratory rate of greater than 60 breaths per minute and is usually the first sign of respiratory distress in neonates. (Gardner et al, 2011, pg. 584).

### **Expiratory grunt**

Expiratory grunting is an audible noise created by the neonate and occurs when the neonate exhales against a partially closed glottis. Grunting maintains a higher residual lung volume and in turn prevents alveoli from collapsing and improves gas exchange (Levene et al, 2008, pg. 92). It is often considered a form of self-administered positive end expiratory pressure.

### **Chest retraction or recession**

Chest retraction or recession occurs due to the increased negative intrathoracic pressure that is necessary to ventilate a stiff and non-compliant lung.

This increased negative pressure causes the chest wall to retract (Gardner et al, 2011, pg. 584).

*Intercostal retractions* are defined as 'the inward movement of the muscles between the ribs as a result of reduced pressure in the chest wall cavity' (<http://www.nlm.nih.gov/medlineplus/ency/article/003322.htm>).

All recessions are signs that the baby is having difficulty breathing.



**Figure 1: Intercostal retractions**

*Sternal recession* occurs as increasingly negative intrathoracic pressure causes the in-drawing of the sternum and is a sign of severe respiratory distress



**Figure 2: Sternal recession**

### **Nasal Flaring**

Nasal flaring is a compensatory mechanism used by the neonate to increase oxygen intake by increasing the size of the nares and therefore decreasing the resistance of the narrow airways (by approximately 40%) (Gardner et al, 2011, pg. 584).

### **Cyanosis in room air**

Cyanosis is a blue discolouration of the skin, nail beds and mucous membranes. Central cyanosis is caused from hypoxaemia and is a late and serious sign of respiratory distress (Gardner et al, 2011, pg. 584).

The diagnosis of 2 or more of the above signs persisting for 4 hours or more suggests respiratory distress. Diagnosis will be made by a full clinical history, physical

examination and appropriate investigations such as a chest x-ray (Levene et al, 2008, pg. 92).

There are many reasons neonates may develop respiratory distress. These include:

### **Respiratory causes**

- Transient tachypnoea of the newborn (TTN)
- Air leaks
- Immature lungs
- Surfactant deficiency
- Meconium aspiration syndrome (MAS)
- Aspiration of blood or liquor
- Persistent pulmonary hypertension of the newborn (PPHN)
- Airway obstructions

### **Cardiac causes**

- Congenital heart disease

### **Central nervous system (CNS)**

- CNS insult/Hypoxic ischaemic encephalopathy (HIE)
- Seizures
- Birth trauma

### **Metabolic**

- Hypoglycaemia
- Hypothermia (cold stress)
- Sepsis

### **Congenital abnormalities:**

- Congenital diaphragmatic hernia
- Airway obstructions such as choanal atresia

# Continuous Positive Airway Pressure (CPAP) – A treatment option for Respiratory Distress

## Definition of CPAP

A constant positive pressure applied to the airways of a spontaneously breathing infant throughout the respiratory cycle. It is a form of non-invasive respiratory support (Goldsmith & Karotkin, 2011). This learning resource focuses on the **nasal** administration of CPAP.

Functional residual capacity (or FRC) is the volume of air present in the lungs after respiration and comprises the residual lung volume and the expiratory reserve volume. CPAP helps to provide distension of the lungs thereby preventing collapse of the alveoli and the terminal airways during expiration. This ensures a reasonable lung volume with every breath and more effective gas exchange (Goldsmith & Karotkin, 2011).

The 2013 Victorian 'Guideline for the Administration of nasal CPAP in Victorian non-tertiary Level 2 nurseries' can be found on the PIPER website homepage <http://www.rch.org.au/piper/> This is a very valuable resource.

The guidelines discuss that the application of NCPAP should be performed by trained personnel under the direction of a paediatrician in a hospital with a clear policy for the use of NCPAP. The Consultant paediatrician responsible for the neonate is encouraged to access clinical advice and support directly from the PIPER Consultant. For neonates who fall outside the recommended indications or signs of failure become evident (as per the Victorian 2013 'Guideline for the Administration of nasal CPAP in Victorian non-tertiary Level 2 nurseries'), immediate consultation with the duty PIPER Consultant is required to discuss further management and retrieval.



## **Indications for NCPAP in babies having continuing care in non-tertiary L2 SCN's: Victorian guidelines 2013**

- BW > 1499 grams
- Gestation  $\geq$  32 weeks
- Neonate is less than 24 hours old
  - The use of rescue NCPAP in a 2-3 day old baby with progressive respiratory failure is not infrequently followed by the need for rescue endotracheal intubation and aggressive mechanical ventilation
- Have clinical signs of respiratory distress
- Require  $FiO_2$  of > 0.25
- A chest radiograph consistent with mild respiratory distress or transient tachypnoea.
- NB: babies on NCPAP requiring ongoing  $FiO_2$  >0.40 must be discussed with the on duty PIPER consultant

## **Contraindications for NCPAP in babies having continuing care in non-tertiary L2 SCN's: Victorian guidelines 2013**

- BW  $\leq$  1500 grams
- Gestation < 32 weeks
- More than 24 hours of age at initiation of NCPAP
- Insufficient medical/nursing resources
- Requiring  $Fi O_2$  > 0.40 (after commencing NCPAP)
- Persistent hypercarbia ( $PaCO_2$ >60mmHg) with respiratory acidosis (pH < 7.25)
- Apnoea
  - Babies >1499g and  $\geq$  32 weeks gestation rarely have uncomplicated apnoea of prematurity as a reason to require NCPAP
- Babies who remain dependent on NCPAP for >72 hours
- NCPAP can be initiated on these babies, but early discussion with PIPER to arrange transfer to a level

3 NICU should occur.

### **Some other contraindications for the use of NCPAP**

- Upper airway abnormalities that make NCPAP ineffective or dangerous
  - Choanal atresia
  - Cleft palate
  - Oesophageal atresia (+/- tracheoesophageal fistula - TOF)
- Congenital abnormalities such as:
  - congenital diaphragmatic hernia
  - gastroschisis
  - exomphalous.
- Unstable respiratory drive with frequent apnoeic episodes resulting in desaturation and/or bradycardia
- Other infants with severe cardiovascular instability (hypotension, poor ventricular function).
- Infants with necrotizing enterocolitis or bowel obstruction.

(Goldsmith & Karotkin, 2011, p. 157)

## **Techniques and device options for administration of NCPAP**

Bi-nasal prongs are the most commonly used interface in Victoria.

The TeleFlex 'Hudson Prong'<sup>®</sup> nasal prongs (figure 3, 3.1, 3.2) and the Fisher & Paykel Healthcare Patient Interface<sup>®</sup> - the 'midline nasal prongs/masks' (figure 4, 4.1, 4.2, 4.3, 4.4) are the two most commonly used CPAP interfaces currently in Victoria.

Other interfaces available include the Draegar Babyflow<sup>™</sup> (figure 5), Cooper Surgical INCA<sup>®</sup> prongs (figure 6) and Covidien Argyle<sup>®</sup> (figure 7) prongs



**Figure 3: Teleflex Hudson Prongs<sup>®</sup> with hat, velcro and size chart**

Size of Hudson prongs appropriate for weight:

Birthweight <700g	size 0
Birthweight 700-1000gms	size 1
Birthweight 1000-2000g	size 2
Birthweight 2000-3000g	size 3
Birthweight 3000-4000	size 4
Birthweight >4000g	size 5



**Figure 3.1: TeleFlex Hudson Prongs® with hat and Velcro applied to neonate**



**Figure 3.2: TeleFlex Hudson Prongs® with Canberra hat**



**Figure 4: Fisher & Paykel Healthcare® midline CPAP system:**



**Figure 4.1: Fisher & Paykel Healthcare® midline CPAP hat:**



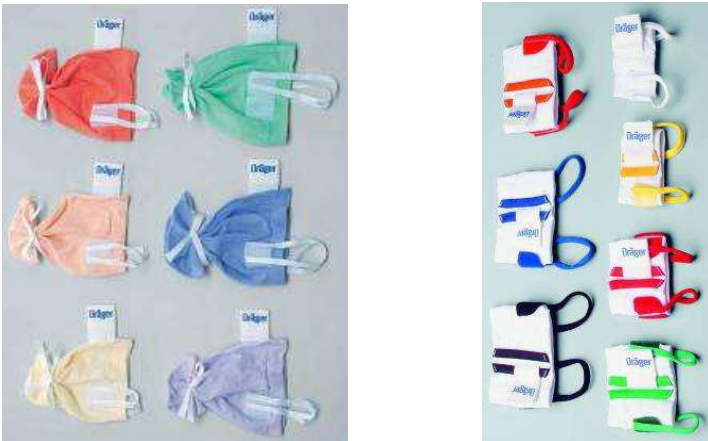
**Figure 4.2: Fisher & Paykel Healthcare® midline CPAP nasal prongs and face mask**



**Figure 4.3: Fisher & Paykel Healthcare® midline CPAP interface tubing**



**Figure 4.4: Fisher & Paykel Healthcare® midline CPAP chin strap**



**Figure 5: Draeger Babyflow™ CPAP hats and interface**



**Figure 6:**  
Cooper Surgical INCA® prongs



**Figure 7:**  
Covidien Argyle® CPAP prongs

NCPAP can also be administered via a *single prong* approach. This involves using a modified endotracheal tube (ETT) to administer nasal CPAP:

- The nasal tube is a size 3.0mm Portex tube cut off approximately 5cm from the beveled end.
- Cut from the top of the ETT not the bottom as the bottom is beveled to assist insertion
- The tube is then inserted 2.5 to 3cm into one nostril, bevel down and fixed in the same manner as a nasal ETT.
- NCPAP is supplied using a continuous flow infant mechanical ventilator (with a heater/humidifier) set in the CPAP mode (Boland & McLean 2007, )

ETT CPAP is not recommended for administration of CPAP as airway resistance increases and this makes it very difficult for the neonate to inspire. Breathing through an ETT is commonly referred to as 'breathing through a straw'.

Devices with short nasal prongs are preferred as they offer the lowest resistance to flow (DePaoli et al, 2002).

Commonly used devices to generate NCPAP in Victoria are the Fisher & Paykel Healthcare® bubble CPAP system (figure 8) and a mechanical ventilator delivery system (e.g. via the Draeger babylog 8000®, Bearcub 750 PSV, babyPAC 100, Stephan Reanimator F120).

The delivery System of Bubble CPAP consists of:

- Pressure Manifold
- MR290 humidification chamber
- Single-heated breathing circuit

- CPAP Generator
- Sterile water for irrigation



**Figure 8: The Fisher & Paykel Healthcare® Bubble CPAP system setup**



**Figure 8.1: The Fisher & Paykel Healthcare® Nasal prongs**



**Figure 8.2: The Fisher & Paykel Healthcare® Face mask**

## Equipment and resources required for NCPAP delivery via mechanical ventilator or bubble system

- Appropriately trained staff (medical and nursing). Generally 1:1 or 1:2 ratio nursing care is advised. In the level 3 centres a neonate on NCPAP is considered an intensive care patient.
- Medical air and oxygen attached to a blender
- For Bubble NCPAP:
  - Delivery system described above and Fisher & Paykel Healthcare® Interface (prongs/mask) and head gear (hat, chin strap) (Figures 8.1 & 8.2)
- Humidifier base and water for irrigation
- For ventilator NCPAP:
  - Mechanical ventilator on CPAP mode
  - Compatible patient circuit and interface of choice (prongs/mask) and head gear (hat, chin strap)
  - Humidifier base and chamber for ventilator with water for irrigation.
  - Run the Fisher & Paykel Healthcare® humidifier setting of 40<sup>-3</sup> for the MR730 or intubation mode for MR850 that automatically heats the base to aim for a temperature of 37°C. at the patient. You do not need to manually set a temperature on the MR850 – just turn it on.
- Measuring devices to choose appropriate hat and interface for patient
  - The Fisher & Paykel Healthcare® midline NCPAP comes with a measuring guide
  - The TeleFlex Hudson Prongs® also come with a size guide and a 'one size fits all' hat
- If using Canberra hats (figure 9) - the measurements in cm are displayed on the front of the hat. You will need a head circumference in order to choose the appropriate size hat. They come in sizes extra small through to extra large.





**Figure 9: The Canberra Hat**

- Cardio-respiratory monitor
  - Including non-invasive BP monitoring if available
- Low pressure suction unit
  - Suction catheters size 6, 8 and 10 FG readily available
- Emergency resuscitation equipment
  - T-piece device and/or bag and mask device
  - Resuscitation drugs (Adrenaline 1:10,000 and 0.9% sodium chloride)
- Intubation equipment including appropriate sized laryngoscope and blade, endotracheal tubes and a carbon dioxide detector if available.
- Emergency pneumothorax kit for needle aspiration with chest drain equipment available
  - 21 gauge butterfly needle or 22 gauge cannula
  - 3 way stopcock
  - 10 or 20 mL syringe
  - Alcohol swab
  - Sterile cotton swab
- Size 8 FG orogastric tube (OGT)

### **Before initiating NCPAP**

The Paediatrician must determine the following parameters:

- CPAP: The current Victorian CPAP guidelines state CPAP should be commenced at a CPAP of 7cm of H<sub>2</sub>O; it may be increased at the discretion of the Paediatrician.
- Flow rate: Refer to your user guide for particular ventilator in your nursery. Generally a flow of 6-10 L/min is required to maintain functional residual capacity (FRC). If using Fisher & Paykel Healthcare Patient Interface® it is recommended to use 6 to



8L/min flow.

- Oxygen concentration required by the infant.
- They will also order blood gas analysis as they feel necessary.

## **Nursing care specific to NCPAP**

### **Airway management**

Once the airway has been established, the primary goal is to keep it patent and free of secretions. The airway should be secured in place and verified by physical assessment.

Humidification of inspired gas is very important when administering NCPAP to a neonate. Optimal humidity is a main factor in achieving the best outcomes with the use of NCPAP. Without humidity the secretions can become thickened and there can be pooling of mucous. This increases the resistance to airflow and increases the work of breathing (WOB) – it can even cause complete blockage of the airway.

Delivery of gas to the airway at approximately 37°C minimises the risk of thickened secretions and the risk of potential obstruction. This maximises gas exchange and will hopefully decrease WOB.

### **Care of the airway**

- Ensure suction apparatus and resuscitation equipment is readily available. Sizes 6, 8 and 10 FG suction catheters should be available at bedside.
- Clear the infant's oropharynx PRN.
- For a modified endotracheal tube, suctioning of the mouth and nose may only need to coincide with changing of the tube. The tube itself may require frequent suction to prevent blockage.
- For bi-nasal prongs, suction mouth and nose when indicated. This is generally done 6 hourly and PRN.
- Ideally suctioning can coincide with general nursing care when the airway and nares are being closely inspected.
- The Paediatrician will need to be available to change a modified endotracheal tube on an 'as needed' basis, as secretions can rapidly accumulate and can cause obstruction.

- Binasal prongs should be removed at least once a shift to review the nasal septum and nares for skin break down and pressure necrosis (figure 10). This is also a good opportunity to suction the nares if required. The prongs may also require cleaning.



**Figure 10 – Nasal trauma from nasal CPAP prongs**

- CPAP hat should also be removed once a shift to assess head for pressure points and moulding.
- Insert and secure a size 8 FG orogastric tube and have on free drainage to prevent abdominal distension.
- The neonate should be repositioned every 6 hours – this is essential for pressure area care and neurodevelopmental outcome. Neonates on CPAP can be positioned any way that promotes comfort and optimal positioning of the airway. The neonate will need to be sufficiently supported with neck rolls and nesting. The prone position may improve respiratory pattern, decrease WOB and oxygen requirement.
- Be prepared for worsening of condition or collapse, therefore have resuscitation equipment readily available and in working order, including emergency Pneumothorax equipment. (Boland and McLean, 2007, pg.89)

## **Equipment function**

### **CPAP equipment**

- Functioning of the ventilator or other gas delivery system is checked before use.
- Alarms should be activated to alert caregivers of gas delivery system malfunction or disconnection. (Note: alarms are not available on all systems e.g. bubble system. If there is no bubbling in the water chamber then no CPAP is being administered so it is important to keep a close eye on the bubble CPAP system)
- CPAP and humidifier settings should be checked frequently and documented at least hourly (Boland and McLean, 2007, pg.89)

**Resuscitation equipment:**

- Functioning resuscitation equipment must be located in the immediate area.
- Equipment for the identification and aspiration of a pneumothorax and intercostal catheter insertion.
- Equipment available for nasal tube/prong replacement. A Medical Officer skilled in these procedures must be 'on site' to undertake these if indicated (Boland and McLean, 2007, pg.89).

**Monitoring equipment:**

Physical assessment and monitor inspection should be performed by the nurse at least half hourly in the initial stabilization period. Thereafter, hourly observations are sufficient as long as the infant's condition remains stable. Document findings of assessment on the neonate's observation chart. Continuous cardio-respiratory monitoring with activated high and low alarm settings is required (Boland and McLean, 2007, pg.90)

**Physical assessment****Temperature**

- Document hourly.
- Taken per axilla (if within normal range just take and document 6 hourly).
- Environmental temperature (incubator or radiant warmer – both set and actual temperatures being delivered).
- Skin temperature (if servo control used).
- Humidifier base temperature setting and temperature of inspired gases that heater wire is recording.
- Significance/actions in response to changes in any of the above.

**Heart Rate**

- Document hourly.
- Continuous monitoring of heart rate.
- Auscultation of apex beat 4 hourly and PRN.
- Rhythm. Note and report to medical officer if rhythm deviates from sinus rhythm.

## **Respirations**

- Document hourly.
- Continuous monitoring of respiratory rate to detect apnoea, tachypnoea or bradypnoea.
- Rate, rhythm, degree of retraction.
- Air entry by auscultation—equal bilaterally, quality.
- Periodic evaluation of chest X-rays.

## **Blood pressure**

- Document 6 hourly - non-invasive.
- Significance of hypotension or hypertension.

## **Colour**

- Document hourly.
- Significance of central cyanosis, pallor, or 'mottling', which may be due to:
  - Obstructed airway.
  - Malfunction of ventilator/bubble CPAP system.
  - Malpositioned tube/prongs.
  - Disconnection of tube/prongs from delivery system.
  - Blocked prongs with secretions.
  - Air leak syndromes.

## **Activity pattern**

- Document hourly.
- Tone, lethargy, irritability, 'jitteriness', seizures.

## **Tissue surrounding prongs/tube**

- Document 6 hourly when handling and attending general nursing care.
- Pressure related injury. Assess colour, perfusion, pressure and excoriation/break down.

## **Tissue of head and neck**

- Document 6 hourly when handling and attending general nursing care.
- Irritation from improperly secured hat or inappropriate hat size.

## **Blood glucose level**

- Periodic (e.g. on admission then 3 to 4 hourly once  $\geq 2.6$ mmol/L and as per hospital policy).

### **Fluid balance**

- Document hourly.
- Intake/output.
- Significance—dehydration/fluid overload.
- Parenteral fluids-initially nil orally.
- Observe for abdominal distension.

### **IV site(s)**

- Document hourly.
- Intravenous site: observe for redness, swelling, blanching and leaking.

### **Pulse oximetry**

- Document hourly.
- Continuous monitoring.
- Target oxygen parameters for all neonates receiving supplemental oxygen are:
  - SpO<sub>2</sub> 91- 95%
  - Default alarm limits are 89%-95%
  - When weaned from oxygen to room air the upper alarm limit may be increased to 100%

(Dr Carl Kuschel, 2013)

- Transcutaneous PO<sub>2</sub> and PCO<sub>2</sub> (if available)
- Continuous monitoring. Change sensor site according to manufacturer's instructions, (usually 2-4 hourly), to prevent underlying skin damage.
  - Document these readings ½ hourly

(Boland and McLean, 2007, pg.90)

## **Complications associated with nasal CPAP**

### **Hazards associated with equipment**

- Obstruction of nasal tube/prongs from mucus plugging or kinking.
- Increased resistance created by turbulent flow through the small tube, thus the pressure of the CPAP system is maintained even when decannulation has accidentally occurred.
- Complete obstruction of the NCPAP tube results in pressurization of the CPAP system without activating alarms.

- Inability to maintain NCPAP when the neonate is crying or has mouth open.
- Malpositioning or displacement of NCPAP device. (American Association of Respiratory Care, 2004) (Boland and McLean, 2007, pg.92)

### **Complications associated with the neonate's clinical condition**

- Lung over-distension leading to air leak syndromes.
- Ventilation/perfusion (V/Q) mismatch.
- CO<sub>2</sub> retention and increased work of breathing particularly with higher levels of CPAP >8cm H<sub>2</sub>O.
- Impedance of pulmonary blood flow leading to increased pulmonary vascular resistance and a decrease in cardiac output.
- Abdominal distension and gastric insufflation and associated feed intolerance.
- Nasal irritation and septal distortion.
- Skin irritation and pressure necrosis.
- Nasal mucosal damage due to inadequate humidification. (American Association of Respiratory Care, 2004) (Boland and McLean, 2007, pg.92)

## **Nutrition**

(This information has been taken from the 'Guideline for the administration of nasal CPAP in Victorian non-tertiary level 2 nurseries' 2013).

Babies who receive NCPAP for acute respiratory indications in the first 24 hours after birth are kept nil by mouth until:

- respiratory rate is <70 breaths/min.
- the FiO<sub>2</sub> is <0.25
- work of breathing (as evidenced by grunting, intercostal recession) has improved significantly

Therefore maintenance IV fluids are required. This is IV 10% Glucose at 60mL/kg/day for day 1.

Once the neonate is stable and improving, trophic (small amounts) feeds can be commenced cautiously (<15mL/kg/day). If risks for necrotizing enterocolitis exist (e.g. early compromise or severe growth restriction), discuss with the duty PIPER Consultant.

If feeds cannot be commenced by *96 hours* of age due to ongoing respiratory distress, parenteral nutrition will usually be required and the baby should be transferred to a tertiary centre.

## **Weaning CPAP**

(As per 'Guideline for the administration of nasal CPAP in Victorian non-tertiary level 2 nurseries' 2013)

Once a baby's respiratory rate falls below 70 breaths/min, the  $FiO_2$  is  $<0.25$  and the baby is breathing with less effort, the CPAP should be reduced by 1cm  $H_2O$  every 2-4 hours until at 5cm  $H_2O$ .

A trial off NCPAP is undertaken once the baby is stable for several hours on a CPAP of 5cm  $H_2O$  in a  $FiO_2 < 0.25$  with a respiratory rate  $< 70$  breaths/min.

It is common to see a mild increase in respiratory rate (10-20 breaths/min) as well as a small increase in inspired oxygen concentration (for example,  $FiO_2$  0.25 to  $FiO_2$  0.30) in the first hour after discontinuation of NCPAP. This weaning strategy is pragmatic rather than prescriptive.

## **Conclusion**

(As per 'Guideline for the administration of nasal CPAP in Victorian non-tertiary level 2 nurseries' 2013)

CPAP is the application of positive pressure to the airways of spontaneously breathing patients throughout the respiratory cycle. Correctly applied NCPAP in babies with respiratory distress facilitates and sustains lung inflation. When applied to babies with respiratory distress, NCPAP results in a reduced requirement for oxygen and a reduction in the respiratory rate, work of breathing and other signs of respiratory distress.

While it can be argued that many babies receiving NCPAP might be more appropriately classed as requiring high dependency rather than intensive care in terms of acuity, tertiary neonatal centers regard NCPAP as an intensive care practice and resource it accordingly.

Currently 8 of the 20 public Level 2 nurseries in Victoria offer NCPAP as a treatment for babies with respiratory distress with a number of others well advanced in their

plans to introduce NCPAP.

NCPAP is a relatively simple and effective therapy for respiratory distress syndrome, however it is resource intensive, particularly in relation to the requirement for skilled medical and nursing care ('Guideline for the administration of nasal CPAP in Victorian non-tertiary level 2 nurseries' 2013)

## **How to make a PIPER referral and other enquiries**

The PIPER (was NETS/PETS/PERS) contact number for an emergency is: **1300 137 650**

### **A clinical coordinator will require the following details:**

- Name of referrer
- Hospital you are calling from
- Your direct telephone number
- Name, date of birth and gender of patient

The coordinator will then transfer your call into a 'conference room' and have the PIPER neonatologist and appropriate PIPER transport staff to join the call. Once they have joined the referral takes place.

### **Information required by the PIPER consultant includes:**

- Reason for referral
- Birth history
- Condition of the baby
- Vital signs
- Treatment received/receiving
- Intravenous access points
- Medications administered
- Blood results
- Chest X-ray findings
- Resources at your health service

Stabilisation advice will be given by the PIPER consultant and a PIPER team will be activated to come and retrieve the patient and transfer to an appropriate healthcare



centre.

**Upon arrival, the PIPER team will require:**

- 240v power access
- Oxygen and medical air access
- Space for PIPER cot
- Signed consent for transfer x2
- Completed perinatal history sheet
- Photocopies of paperwork such as observation chart, medication chart, fluid chart
- X-rays (film or CD)
- Green 'health and development' record with completed birth history/immunisation details

**Other enquiries**

For non-emergency queries:

- Call the PIPER non-emergency line on **1300 659 803**

For PIPER education enquiries:

- Contact **1300 662 434** or alternatively email [nets.education@netsvic.org.au](mailto:nets.education@netsvic.org.au)

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