Neopuff Set Up and Use

**Aim**

This guideline aims to provide information to enable health-carers to set up and use a Neopuff safely and effectively within the Butterfly Ward of the Royal Children’s Hospital. All babies on the Butterfly Ward should have a Neopuff setup by the bedside for hand ventilation if required.

**Definition of Terms**

**Neopuff:** Flow dependent infant resuscitator which delivers breaths manually with accurate PIP and PEEP

**PIP:** Peak inspiratory pressure – point of maximum airway pressure

**PEEP:** Positive end expiratory pressure – pressure maintained in airway at end of exhalation

**CPAP:** Continuous positive airway pressure

**Flow:** Amount of inspiratory gas given through the Neopuff measured in litres per minute

**Max Pressure:** Default maximum PIP which is set manually

**T_i:** Inspiratory time – duration of time in inspiration

**T_e:** Expiratory time – duration of time in expiration

**Lpm:** Litres per minute

**SCN:** Special Care Nursery

**NICU:** Neonatal Intensive Care Unit

**HFOV:** High frequency oscillatory ventilation

**Indications for Use**
• To provide supplemental oxygen via facemask if required
• To provide manual breaths to an apnoeic infant
• To deliver CPAP e.g. post extubation immediately prior to commencement of CPAP
• To deliver accurate pressures in a ventilated infant requiring manual ventilation

Set Up

Set-up should be checked and documented at the commencement of every shift, prior to the admission / transfer of a new neonate to a bed space, and whenever ventilator settings are altered.

• Connect gas supply line (green oxygen tubing) to the gas inlet on Neopuff (gas supply line is connected to blender in NICU, and to the oxygen flow meter in SCN)
• Connect patient supply line (clear tubing) to the gas outlet on Neopuff
• Turn flow to 8 lpm
• Seal T-Piece
• To check maximum pressure:
  o Occlude PEEP cap and turn PIP control fully clockwise
  o Adjust max pressure control knob clockwise or anti-clockwise to set max pressure of 4
• To set the PIP:
  o Occlude PEEP cap and turn the inspiratory pressure control anti-clockwise to set desired PIP
• To set the PEEP:
  o Turn the cap on the T-Piece clockwise or anti-clockwise to set PEEP at desired level
• Attach appropriate face mask to patient supply line if patient is not ventilated
• Once Neopuff has been set up and checked, document date, time, settings and sign on the designated plate on the Neopuff

Management

Default settings for Neopuff (non-ventilated neonates):

Set PIP to 30 cmH\text{\textsuperscript{2}}0

Set PEEP to 8 cmH\text{\textsuperscript{2}}0

Set Max pressure to 40 cmH\text{\textsuperscript{2}}0
Or as per medical orders (documented daily on Treatment Orders sheet)

Default settings for Neopuff (ventilated neonates):

Set PIP to 2 cmH\(^2\)0 above ventilator PIP

Set PEEP to same PEEP as ventilator

Set Max pressure to 40 cmH\(^2\)0

Or as per medical orders for specific infants, e.g. those on HFOV, or with conditions such as congenital diaphragmatic hernia, chronic lung disease, abdominal distension and known splinting episodes (documented daily on Treatment Orders sheet). This should be discussed on the ward round

Confirm with medical staff if unsure of settings

How to Use

- Adjust gas supply to 8lpm
- Fit T-Piece to neonatal resuscitation mask and place over baby’s mouth and nose OR fit T-Piece to the endotracheal tube if in-situ
- Ventilate by placing and removing thumb over the PEEP cap to allow inspiration and expiration

Patient not on respiratory support

- Occlude the PEEP cap for 0.5 second \((T_i)\) then release for 0.5 second \((T_e)\), this will provide a ventilation rate of 60 breaths per minute at the previously set PIP and PEEP pressures
- Continue to check the PIP is being delivered at the recommended default settings on the manometer
- Continue to check the mask seal by checking that PEEP is returning to 8cmH\(^2\)0 after each manual inflation on the manometer
- To adjust the PIP whilst using the Neopuff: adjust the inspiratory pressure control, this can be changed while resuscitating but may require a second person

Patient on respiratory support
• In NICU, the gas supply is attached to a blender, ensure this is dialled up to required FiO₂
• If a ventilated neonate deteriorates, the first line of management should be to adjust the ventilator settings, e.g. increase PIP and/or rate (as per medical orders) rather than disconnect from the ventilator and connect straight to the Neopuff
• If ventilator settings have been increased to manage patient deterioration, ensure that Neopuff settings have also been increased accordingly
• Use Neopuff immediately if ventilator malfunction is suspected

Trouble Shooting

Unable to achieve desired PIP/PEEP:

• Ensure oxygen tubing is attached and is set at 8 lpm
• Ensure the maximum pressure is increased if needing to use higher PIP than 40cmH₂O
• Check seal of the face mask; remove tapes from face; remove nasogastric tube
• Reposition the neonate’s head/neck and face mask
• Ensure all connections are secure

References