

HUMIDIFIED LOW FLOW OXYGEN ON THE WARD - SCH

PRACTICE GUIDELINE[®]

DOCUMENT SUMMARY/KEY POINTS

- This document describes standard humidified low flow oxygen therapy delivery on the ward at SCH:
- For humidified high flow oxygen via nasal prongs refer to the specific document.
- For non-humidified oxygen delivery refer to Oxygen Therapy and Delivery Devices.
- Humidified oxygen needs to be ordered by a Medical Officer, and documented in the patient notes, including percentage of oxygen or flow of oxygen and device.
- Children receiving humidified oxygen require continuous monitoring and hourly observations including oxygen saturation, respiratory rate, heart rate, and work of breathing.

Related policies:

- Humidified High flow Nasal Prong Oxygen - SCH
- Oxygen Therapy and Delivery Devices.
- Pulse Oximetry
- Nasopharyngeal Aspiration - SCH
- Nasopharyngeal and Oropharyngeal Suctioning - SCH

CHANGE SUMMARY

- Document due for mandatory review.
- Replaces SCH document C.10.08 of similar name.
- No change in practice.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Approved by:	SCHN Policy, Procedure and Guideline Committee	
Date Effective:	1 st October 2015	Review Period: 3 years
Team Leader:	Clinical Nurse Consultant, Acute Respiratory	Area/Dept: Respiratory

READ ACKNOWLEDGEMENT

- All SCH clinical staff managing patients on oxygen therapy devices are to read and acknowledge they understand the contents of this guideline

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Purpose and Scope

This guideline aims to address the principals of care and management of the paediatric patient receiving humidified low flow oxygen. In addition, this guideline clarifies the necessary equipment and set processes required to humidify oxygen.

Standards of Care

- Humidified oxygen needs to be ordered by a Medical Officer, and documented in the patient notes, including percentage of oxygen or flow of oxygen and device.
- Staff members must be able to correctly assemble equipment for humidified oxygen, selecting the appropriate oxygen delivery device that correlates with the amount of oxygen being given.
- Staff must be able to clinically manage a paediatric patient with respiratory distress.
- Staff members caring for paediatric patients' receiving humidified oxygen must provide general information regarding oxygen delivery and humidification to the child and family in a developmentally appropriate manner.
- Humidification is usually not required if patient is on low flow oxygen for short term. Consideration for humidification should be based on nursing assessment of the individual patient including clinical appearance and length of illness.

General knowledge

- Administration of oxygen may become necessary to reduce the work of breathing and increase oxygen saturations. Inhalation of oxygen without humidification can dry the mucous membranes causing general discomfort and irritation. By providing optimal humidity with supplemental oxygen, the heat and moisture loss from the mucosa is minimised.
- Humidified oxygen is able to sustain airway patency and lung compliance while maintaining the mucociliary transport system and the consistency of secretions. Humidification also reduces the patient's caloric load required to humidify their inspiratory gases.
- Finally, the fact that the gas flow is warm and moist allows the application of humidified oxygen to be delivered at a high rate.

Indications for humidified oxygen

- Bronchiolitis
- Pneumonia
- Asthma
- Cystic Fibrosis
- Chronic lung disease
- Palliation

This system can also be used in patients with a tracheostomy requiring respiratory support. (See: Tracheostomy Practice Guideline)

Consider humidified oxygen

- **Neonates:** if the gas flow exceeds 500 mL/kg/min
- **Infants:** with a gas flow of 2 L/min or over
- **Children:** with a gas flow of 4 L/min or over

Note: Patients requiring High Flow Oxygen (equal to or exceeding 1L/kg/min) should be cared for in the Emergency Department or CICU.

Contraindications

- Nasal obstruction e.g. choanal atresia, large polyps.
- Life threatening hypoxia secondary to respiratory failure.
- Foreign body aspiration.
- Numerous persistent apnoeic episodes.

Note: Proceed with caution in patients with Congenital Heart Disease.

Ongoing clinical management

- Hourly monitoring and recording of skin colour, respiratory rate, work of breathing, heart rate, and continuous pulse oximetry. These observations are to be recorded in the age appropriate Standard Paediatric Observation Chart [SPOC] and respiratory observation chart.
- Checking nasal prong and mask position is important, as dislodgement will result in a loss of oxygen. Check hourly.
- Check skin integrity under and around oxygen delivery device as skin irritation and redness can develop.
- To prevent nasal secretions blocking the airways, 0.9% saline drops can be administered intranasally and patient suctioned as required.
- Water bags and humidifier circuits must be dated as these need to be replaced every 48 hours while in use.

Weaning humidified oxygen

- To be commenced when child's clinical condition is improving and parameters are within the white and blue zone on the SPOC charts.
- Weaning of oxygen is to be documented in patient's clinical notes.
- Skin colour, respiratory rate, work of breathing, heart rate and oxygen saturation should be monitored during weaning process and the Medical Officer informed of any deterioration.

Cleaning

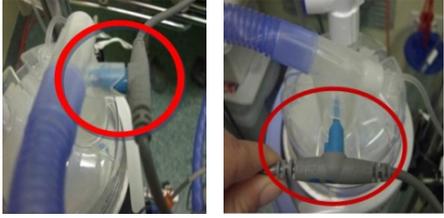
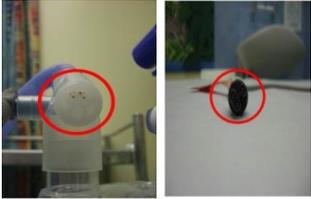
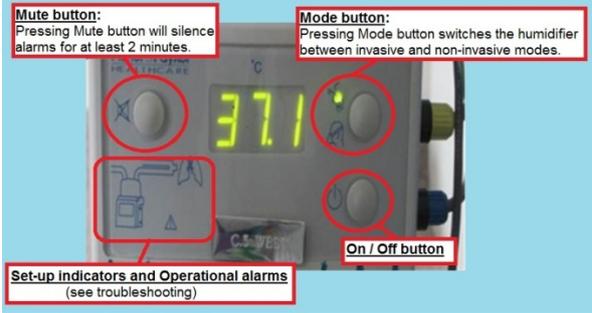
- The circuit including humidification chamber is disposable. The circuit and water bag should be changed every 7 days on the same patient and documented in patient care plan.
- The humidifier, heater wire and temperature probe are not disposable. The probe can be wiped down with Neutral Detergent cleaning solution after use. Do not immerse the heater base or temperature probe electrical connections in any liquid. If the patient has a multi-resistant organism [MRO] then consider using bleach or sending equipment to CSSD for cleaning.

Set-Up

NB: For optimal patient comfort it is recommended that the humidifier be turn on, circuit connected and the gas run for approximately 10-15min in order to warm up the gas to at least 36 degrees, before applying to the patient.

Action	Diagrams
<p>Fit the Chamber</p> <ol style="list-style-type: none"> 1. Place the humidified base on to bracket on IV pole. Ensuring that the humidifier is always positioned lower than the patient. 2. Slide the humidification chamber onto the Humidifier base and remove the blue caps. 	
<p>Hang the water bag</p> <p>Hang water bag from IV Pole. Unwind the water feed set (line) and spike water bag. The bag should be at least 50 cm above the chamber. Ensure that water feed set is not kinked and that water is present in chamber.</p>	

<p>Connect the Circuit</p> <p>3. Connect the pressure relief valve to the chamber.</p>	
<p>4. Connect one end of oxygen tubing to O₂ flow meter on wall and the other to the pressure relief valve on humidifier.</p>	
<p>5. Set flow meter Flow may be set up to 1 L/kg/min. Note: if a low flow meter (0-3L) is being used there should always be a standard flow (0-15L) connected to the wall outlet by the bedside.</p>	
<p>6. Connect the elbow of the blue breathing circuit to the humidification chamber.</p>	
<p>Connect the temperature probe</p> <p>7. Connect the blue temperature probe plug into the blue socket on the side of the humidifier.</p> <p>8. Securely insert blue twin probe into breathing circuit elbow above the chamber.</p>	

<p>9. Insert blue single probe into port at patient end of breathing circuit.</p>	 
<p>Connect the heater wire adaptor</p> <p>10. Connect yellow heater wire adaptor plug into yellow socket on the side of the humidifier.</p> <p>11. Connect clover leaf end into socket on the breathing circuit elbow above the chamber.</p>	  
<p>Turn the humidifier on.</p> <p>a) The humidifier automatically defaults to invasive mode for nasal prongs.</p> <p>Invasive Mode</p> <p>Delivers gas as close to body temperature and saturated (37°C) as possible for patients with bypassed airways. Normally the displayed temperature will be 37°, but will automatically adjust (35.5 to 39°C) to compensate for environmental conditions. The humidifier defaults to invasive mode when it is turned on.</p>	 <p>Mute button: Pressing Mute button will silence alarms for at least 2 minutes.</p> <p>Mode button: Pressing Mode button switches the humidifier between invasive and non-invasive modes.</p> <p>On / Off button</p> <p>Set-up indicators and Operational alarms (see troubleshooting)</p>

The optimal temperature for humidified oxygen is 37°C. The humidifier heats the circuit to 40°C and there is a drop of 3°C which occurs due to room temperature, gas flow rates and the length of tubing past the thermometer where the temperature is read. The resulting temperature, which should be read off the side of the humidifier is 37°C.

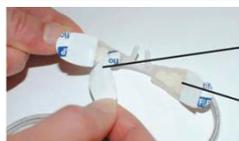
NB: Before connecting to the patient ensure that both the temperature probe sensors are correctly and securely fitted. Failure to do so may result in the sensors reading temperature inaccurately and a temperature in excess of 41°C being delivered to the patient.



Connect to patient.

Once circuit is fully assembled and oxygen running, wait approximately 10-15 min before connecting to patient in order to warm up the gas to at least 36 degrees.

Connect nasal prongs to end of blue circuit and secure nasal prongs to patient.



Remove first layer of backing paper from nasal prong wiggle pads

Wiggle Pads



Position nasal prongs into the nares, ensuring a gap of at least 2mm between the nasal septum and the prongs is present to avoid possible pressure necrosis.



When happy with placement, remove second layer of backing paper from wiggle pads, securing nasal prongs to patient face.

F&P OPTIFLOW JUNIOR		APPROX WEIGHT (KG)											SPARE WIGGLEPADS	
OPTIFLOW JUNIOR NASAL CANNULA	ITEM CODE	2	4	6	8	10	12	14	16	18	20	22		
Premature Size	OPT312	Max. flow 8 L/min												OPT010
Neonatal Size	OPT314	Max. flow 8 L/min												OPT012
Infant Size	OPT316	Max. flow 20 L/min												
Pediatric Size	OPT318							Max. flow 25 L/min						

Note: If administering flows $\geq 1\text{L/kg/min}$ refer to: Humidified High-flow Nasal prong Oxygen – SCH.

Troubleshooting

Excess condensation may develop in the blue circuit tubing and nasal prongs. This may be from inadequate flow (i.e. less than 1 L/min), if this is the case consider changing to standard dry oxygen. Condensation and excess water in tubing can be removed by disconnecting the nasal prongs from blue tubing and pouring water out and reconnecting again.

Set-Up Indicators

Temperature Probe

- Is temperature probe connected to base?
- Temperature probe may be damaged – may need to replace probe.



Chamber Probe

- Is chamber probe fully inserted into circuit?
- Is there condensation or debris on probe? – may need to be removed and dried.

NOTE: Temperature probe may be damaged- may need to replace probe



Airway Probe

- Is airway probe fully inserted into circuit?
- Is there condensation or debris on probe? - May need to be removed and dried.
- Temperature probe may be damaged- replace



Heater Wire

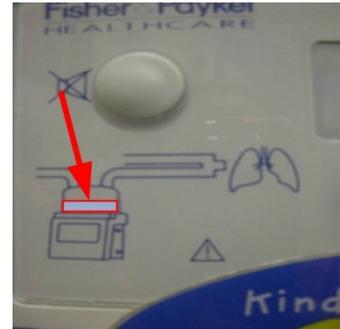
- Is heater wire adaptor connected to base?
- Is heater wire adaptor connected to circuit?
- Circuit may be damaged- replace.
- Adaptor may be damaged- replace.



Operational Alarms

Water

- Is there water in chamber?
- Is there water in bag?
- Is the feed set kinked?
- Chamber may be damaged- replace.



Humidity

- Humidity alarm present in conjunction with a displayed temperature of 35.5°C or lower
 - Is there a fan?- redirect away from breathing circuit
 - Is there a draft?- redirect away from breathing circuit
 - Sometimes due to condensation on temperature probe. Take out briefly and dry. Replace and issue may be resolved.
- Humidity alarm present in conjunction with a displayed temperature of 41°C or higher
 - Monitor displayed temperature closely
 - Sometimes due to condensation on temperature probe. Take out briefly and dry. Replace and issue may be resolved.
 - Temperature probe may be damaged- replace.



Related Documents

1. Humidified High flow Nasal Prong Oxygen SCH
2. Pulse Oximetry:
<http://chw.schn.health.nsw.gov.au/o/documents/policies/guidelines/2015-9055.pdf>
3. Oxygen therapy and delivery devices.
4. Nasopharyngeal Aspiration (NPA) – SCH
<http://chw.schn.health.nsw.gov.au/o/documents/policies/procedures/2015-7003.pdf>
5. Nasopharyngeal and Oropharyngeal Suctioning - SCH

References

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