Use of heated and humidified high flow nasal therapy clinical guideline

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CONTENTS

1. INTRODUCTION

1.1. Purpose

The guideline is intended for use by respiratory physiotherapy staff, critical care outreach team and other clinical staff who are trained and assessed as being competent, to allow treatment of patients experiencing respiratory failure with high flow humidified oxygen therapy that is delivered via nasal prongs.

1.2. Scope

Humidified high flow nasal oxygen therapy (HFNT) has become an increasingly utilised modality for the management of patients with type 1 respiratory failure. HFNT delivers high inspiratory gas flow (up to 60 L/min). Benefits of the use of HFNT include:

- Reversal of hypoxaemia
- Reduced work of breathing
- Improved secretions clearance
- Possible avoidance of intubation
- Possible avoidance of use of non-invasive ventilation (NIV)
- Improved patient tolerance / comfort
- Un- inhibited speaking and feeding

Indications for HFNT are:

- Adult patients with hypoxaemia / type 1 respiratory failure
- Patients with increased work of breathing
- Patients with increased secretions viscocity with an impaired ability to clear secretions
- Poor compliance with mask therapy where oxygen requirements are in excess of 4 L/min
- Post-extubation oxygen therapy
- Weaning of NIV

HFNT does not however deliver measurable continuous positive airway pressures (CPAP) and is therefore not a replacement for CPAP. It does remove some CO2 due to the high flow reducing dead space. It can be used post-extubation, as it can provide a break from NIV to facilitate feeding, physiotherapy, speaking and mouth care.

Contra-indications for HFNT are:

- Patients at risk of acute hypercapnic / type 2 respiratory failure secondary to oxygen delivery
- Skull fractures
- Cerebro-spinal fluid (CSF) leaks
- Nasal passage abnormalities or recent nasal surgery
- Respiratory arrest or peri-arrest / apnoea
- Platelets < 85 x 109 /L or severe epistaxis

1.3. Definitions

High Flow Nasal Therapy

HFNT uses gas flow rates higher than the patient's normal inspiratory flow rate**.** Entrainment of room air is reduced as the flow rate increases and hence HFNT can deliver oxygen at higher concentrations than low flow therapy**.**

High Flow Nasal Therapy System – Optiflow system (Fisher & Paykel)

Term used to describe the system required to deliver humidified high flow oxygen therapy via a nasal cannulae or tracheostomy attachment. The system comprises of a humidifier with an integrated flow generator that delivers warm and humidified respiratory gasses to spontaneously breathing patients through a variety of patient interfaces.

Optiflow Nasal Cannulae

Nasal Cannulae are wide bore nasal prongs used as the interface between the delivery system and the patient.

Airvo 2 (Fisher & Paykel)

Humidifier with integrated flow generator that delivers warmed humidified oxygen and air mixture.

2. GUIDANCE

2.1 Patient selection

- Patients whose saturation oxygen levels are < 94% on 4 litres via normal nasal cannulae.
- Any patient identified by medical or physiotherapy team as having signs of a respiratory pathology (reduced lung volume, retained secretions, infection, CXR changes) who is felt would benefit from HFNT.

Patients should be discussed with the Anaesthetic team for consideration of transfer to level 2/3 care if:

- Oxygen requirements reach 60% or more
- There are signs of acute respiratory distress or failure RR >30 or <10
- Need for repeated ABG's is identified

HFNT to be discontinued and decision documented in the medical notes when:

- Saturation oxygen levels > 95% on 30% FiO2
- Medical or physiotherapy team happy that original respiratory pathology has resolved

2.2 Equipment

- Fisher & Paykel Airvo 2 humidifier
- Optiflow nasal cannulae (OPT 844E, medium size) or Tracheostomy Direct - Connection (OPT 870)Heated tubing MR290 auto-fill chamber and adapter (900PT501)
- Oxygen green tubing (approx. 0.5 m)
- 1litre bag of sterile water for humidification

All pieces of disposable equipment are single patient use only.
The equipment is located in the ITU store room.

Prior usage

- Discuss prior to commencement of high flow nasal oxygen therapy escalation plan for patient and document this clearly in the medical notes.
- Explain procedure to patient. Obtain consent to treat.
- Wash hands, wear apron and gloves in line with Trust Infection Control standards
- Switch equipment on and check Airvo 2 is ready for use (check disinfection status)
- Prepare equipment as per diagram and manufacturer's instructions (Appendix 3).Equipment should only be assembled by physiotherapy staff or other appropriately trained and competent staff.
- Label equipment with date tubing change due (7 days)
- Switch equipment on and configure target temperature and flow (up to 60 L/min flow) (Appendix 3). Adjust oxygen flow meter to patient need (21 – 85 % oxygen).
- For example: set temperature to 37C (ideal if tolerated) and total flow to 35 L/min. Then adjust oxygen flow meter to target oxygen saturation for patient. Increase or decrease total flow (increments of 5 L/min) aiming to match peak inspiratory flow for the patient. If the oxygen flowmeter is set too high for the flow the equipment will alarm. The maximum FiO2 is about 85%.
- Allow Airvo 2 heated humidifier to reach set temperature.
- Connect your patient to equipment with the appropriate interface.

- Monitor patient's saturation oxygen, respiratory rate, blood pressure, heart rate, temperature, conscious level and fluid balance.

- Fill in the appropriate documentation

- Repeat arterial blood gasses within 30 minutes. Titrate FiO2 to patient's response.

- To wean off HFNT, start with reducing FiO2 rather than the flow.

- Once therapy has been discontinued discard the disposables in appropriate waste and water for humidification in sluice. Equipment needs to be cleaned as per manufacture instructions (Appendix 4)

2.1. Compliance

Physiotherapists will receive training from the company representatives and from there on it will become part of their on-call matrix which is performed on an annual basis by the individual. The training will be taken over by the band 6/ band 7 physiotherapist in respiratory care.

On ITU/HDU the representative will educate a high number of nursing staff and key trainers will be allocated to take over the education role. The same procedure will be followed by the CCOT.

The Medical Devices Safety Officer will be kept updated who received the appropriate training and will update the members of staff trained on this device.

3. REFERENCE DOCUMENTS

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4. APPENDICES

Appendix 1: Consultation summary
Appendix 3: Setting up AIRVO 2
Appendix 4: Using AIRVO 2
Appendix 5: AIRVO 2 cleaning, disinfection and reprocessing
Appendix 6: Evaluation of use of HFNT form

4.1. Consultation Summary

	List Groups and/or Individuals Consulted
Those listed opposite have been consulted and any comments/actions incorporated as appropriate. The author must ensure that relevant individuals/groups have been involved in consultation as required prior to this document being submitted for approval.	Rob Tuffin - Consultant Anaesthetist
	Heather Mortimer - Consultant Respiratory Physician
	Linda Cross - Senior Sister - ITU/HDU
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