

## HUMIDIFICATION OF INSPIRED GASES IN PATIENTS WITH TRACHEOSTOMY

### *Staff this document applies to:*

Nurses, Physiotherapists, Medical Staff, Speech Pathologists involved in the care of patients with a tracheostomy on all campuses; including ICU, outpatient clinics, the Ambulatory Care Centre (ACC), and the community.

### *Who is Authorised to Perform this Procedure?*

Physiotherapists, Nurses, Medical Staff

### *State any Related Austin Health Policies or Procedures or Guidelines:*

- [Optiflow Tracheostomy Direct Connector Flow Chart](#)
- [Tracheostomy Emergency Procedures Poster](#)
- [Tracheostomy Procedure – Suctioning via the Tracheostomy Tube](#)
- [Tracheostomy Procedure – Heat Moisture Exchangers](#)
- [Tracheostomy Procedure – Recognising & Clearing a Blocked Tracheostomy Tube](#)
- [Tracheostomy e-learning Package – Humidification](#)
- [Oxygen Therapy Manual](#)
- [Operation manual for AIRVO2](#)

### *Definition:*

The use of humidifiers to warm and moisten inspired gases in a patient with a tracheostomy tube. See TRAMS e-Learning Package-[Humidification](#).

### *Clinical Alert:*

- Inadequate humidification can lead to sputum plugging and partial or complete occlusion of the patient's airway.
- A completely blocked tracheostomy tube is a medical emergency. Call a Respond Blue See: [Tracheostomy Emergency Procedures Poster](#)
- A partially blocked tracheostomy tube may quickly progress to a completely blocked tube. Be alert for signs of partial blockage eg: difficulty passing a suction catheter, a “whistling” noise or inspiratory stridor when the patient breathes or the patient vocalising without a Passy Muir Valve in place.
- A single cannula tube does not have an inner cannula that can be removed or cleaned. The single cannula must remain patent and free from sputum. Appropriate humidification is essential in order to keep this tube patent.

- Note that for the Optiflow delivery systems a 30L medical air flow meter is required to provide adequate flow and humidification to patients with a tracheostomy. See: [Optiflow Direct Tracheostomy Connector Flow Chart](#)

### **Rationale:**

During normal breathing the body heats and humidifies air as it passes through the mouth and nose to the trachea. When a patient is breathing via a tracheostomy tube, these natural mechanisms are bypassed; therefore artificial means of heating and humidifying air must be employed.

Signs that a patient is not adequately humidified include:

- An irritable cough.
- Thick or tenacious secretions.
- Difficulty expectorating secretions.
- An absence of secretions in a normally productive patient.
- Resistance felt on suctioning.
- Secretions slow to move up the catheter during suctioning.
- Secretions collecting on the outside of the catheter during suctioning.
- Secretions visibly collecting within the tracheostomy tube.

### **Expected Outcome:**

All patients with a tracheostomy tube must have their humidification needs assessed and monitored by a physiotherapist and/or nursing staff to ensure:

- The air or oxygen supplied to the airways of a patient with a tracheostomy tube is heated and humidified appropriately.
- The tracheostomy tube is free from accumulated dried secretions and sputum clearance is enhanced by a well humidified airway.

### **Equipment:**

#### **For acute patients**

- A MR850 humidifier that delivers to a guaranteed 37°C.
- Disposable corrugated tubing and chamber kit with internal heating wire (RT308)
- Bag of **water** specific for use with heated humidification systems
- A patient who is an existing TRAMS community patient or is being set up for discharge with a tracheostomy may use an Airvo2 humidifier if set up by TRAMS

### **For non-ventilated patients in the community**

- A humidifier that delivers to 37°C e.g. Airvo2™
- 900PT500 disposable tubing
- HC360 reusable chamber

### **For ventilated patients in the community**

- Individualised requirements are assessed by the Victorian Respiratory Support Service (VRSS) Outreach nurses or physiotherapist.
- Equipment may include a humidifier that delivers between 33-37°C with reusable tubing and water chambers, or a heat moisture exchanger (HME).

### ***Procedure:***

#### **For acute patients**

- Obtain an MR850 (this will heat to a guaranteed 37°C) from Central Sterile Supply Department (CSSD) or ward supplies (exceptions to the delivery of 37°C may exist within the VRSS).
- Set up the RT308 disposable kit. Attach temperature probe and heating wires to tubing. Fill the water chamber by connecting the bag of water for humidification. Connect a tracheostomy mask, direct connector or flex tubing to the distal end of the corrugated tubing ensuring the correct set up is used. See [Oxygen Therapy Manual and Optiflow Direct Tracheostomy Connector Flow Chart](#)
- Check that the humidifier is set to Endo Tracheal Tube (ETT) or tracheostomy mode to ensure that the humidifier will deliver 37°C.
- Ensure that the desired oxygen concentration is being delivered via the system in use (e.g. venturi system, dual flow adaptor, high flow system or ventilator). See [Oxygen Therapy Manual and Optiflow Direct Tracheostomy Connector Flow Chart](#)
- Change the disposable circuit weekly, or more frequently if visibly soiled

#### **For non-ventilated patients in the community**

- An Airvo2™ (humidifier that delivers to 37°C) is provided by TRAMS. See [Operation manual for AIRVO2](#)
- Fill the chamber with distilled water and attach to the unit. Connect the disposable circuit to the Airvo2™.
- Connect a direct connector to the distal end of the corrugated tubing
- Change the disposable circuit as instructed by TRAMS or more frequently if visibly soiled
- Note: The Airvo2™ is pre-set by TRAMS with the desired flow and temperature settings.

#### **For ventilated patients in the community**

- Ventilated patients in the community will have their humidification needs assessed by a senior physiotherapist, VRSS Outreach nurse or member of medical staff. The appropriate humidification device should be obtained from the VRSS, and set up to individual specifications, including oxygen therapy as required.

Clean the reusable circuitry components as directed by the VRSS

### Use of nebulisers to augment humidification:

- Humidification can be augmented by the use of additional nebulisers (e.g. 0.9% sodium chloride, bronchodilators or a mucolytic).
- Nebulisers can be placed within the oxygen delivery system for patients receiving oxygen therapy as shown:



Set up for nebuliser in use with tracheostomy shield and venturi



Set up for nebuliser in use with Optiflow direct connector and dual flow adaptor

Note that if a patient is using a dual flow adaptor with Optiflow and nebuliser, an additional air flow meter needs to be available to drive the nebuliser. This can be achieved if there is a double adaptor for a single air outlet or if there are dual airflow outlets at the bedside.



### **Post Procedure:**

- Ensure that the patient is breathing comfortably and SpO2 is stable.
- Ensure that the patient is being adequately humidified.
- Document any changes or concerns about humidification in the patient's history.

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### **In Consultation With**

The Tracheostomy Policy and Review Committee, TRAMS  
VRSS Outreach

### **References:**

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### **Authorised/Endorsed by:**

Clinical Nursing Standards Committee  
Clinical Policy and Procedure Committee

### **Primary Person/Department Responsible for Document:**

Tracheostomy Review and Management Service