



TRACHEOSTOMY REVIEW AND MANAGEMENT SERVICE (TRAMS) CLINICAL PROCEDURE

TRACHEOSTOMY - USE OF HEAT MOISTURE EXCHANGERS (HME'S)

Staff this document applies to:

- Nurses, Medical Staff, Speech Pathologists, Physiotherapists on all campuses

Related Austin Health policies, procedures or guidelines:

- [Humidification of inspired gases in patients with a tracheostomy](#)
- [Suctioning via the Tracheostomy Tube](#)
- [Recognising & Clearing a Blocked Tracheostomy Tube](#)
- [Tracheostomy e-Learning Package - Humidification](#) (Austin staff, access via Atlas)

Who is authorised to perform this procedure?

- The decision to progress from a heated water humidifier to a heat moisture exchanger (HME) needs to be made by a senior physiotherapist, clinical nurse consultant or member of medical staff.
- All members of nursing, medical, physiotherapy and speech pathology staff can place an HME on a patient's tracheostomy tube.

Clinical Alert:

- HME's provide less humidification than heated water bath humidifiers. If the patient is inadequately humidified, they are at risk of tracheostomy occlusion and/or sputum retention.
- Patients with large amounts of secretions are not suitable for HME use as they can block the tracheostomy with secretions when the HME is in place.
- HME's may not be tolerated by some patients as they marginally increase work of breathing. Patients should be monitored for dyspnoea, fatigue and O₂ desaturation.
- HME's should not be mistaken for Passy Muir Valves which offer no humidification

Purpose:

- To provide a convenient and portable form of humidification to patients with a tracheostomy
- HME's can be placed directly onto the hub of a tracheostomy tube. The HME traps the moisture and heat from exhaled gas allowing it to be recycled on inspiration.
- The most commonly used type of HME at Austin Health is a "Thermovent T" (Smiths Medical Code 70088). There are other forms of HME available, such as foam HME's.

Procedure:

- Suction the patient to ensure a clear airway prior to placing the HME.
- Place the HME on the hub of the patient's tracheostomy tube.
- Picture (a) shows a Thermovent T™, the most commonly used HME at Austin Health
- A specific green oxygen connector can be clipped over the Thermovent to deliver low flow supplemental oxygen (picture b).
- Picture (c) shows a foam HME which can connect oxygen tubing directly to the side port



Post procedure:

- Ensure the patient is adequately humidified whilst the HME is in use. Signs that the patient is inadequately humidified include:
 - Thick or tenacious sputum
 - An irritable cough
 - Difficulty coughing up or suctioning secretions
 - Secretions are collecting and drying within the tracheostomy tube
 - Secretions are very slow to move up the catheter during suctioning
 - Secretions are collecting on the outside of the catheter during suctioning
 - The HME should be discarded when visibly soiled with secretions or every 24 hrs
- Document in the patient's history.

Author/Contributors:

Document author: Tanis Cameron, TRAMS Manager

Document Writer: Jack Ross & Caroline Chao (TRAMS Physiotherapists), Quevy Vu (TRAMS Clinical Nurse Consultant) Updated March 2020

References:

Boer, C., Lansaat, L., Muller, S. H., Brekel, M. W. M., & Hilgers, F. J. M. (2015). Comparative ex vivo study on humidifying function of three speaking valves with integrated heat and moisture exchanger for tracheotomized patients. *Clinical Otolaryngology*, 40(6), 616-621.

Brusasco, C., Corradi, F., Vargas, M., Bona, M., Bruno, F., Marsili, M. & Pelosi, P. (2013). "In vitro" evaluation of Heat and Moisture Exchangers designed for spontaneous breathing tracheostomized patients. *Respiratory care*, respcare-02405.

Disclaimer: This Document has been developed for Austin Health use and has been specifically designed for Austin Health circumstances. Printed versions can only be considered up-to-date for a period of one month from the printing date after which, the latest version should be downloaded from ePPIC.

Care of Adult Patients in Acute Care Facilities with a Tracheostomy: Clinical Practice Guideline (2013)
www.aci.health.nsw.gov.au

Gomaa, D. & Branson, R.D. (2019). Conditioning Inspired Gases for Tracheostomy. *Respiratory Care*, 64 (2), 233-234

Intensive Care Society Standards. Standards for the care of adult patients with a temporary tracheostomy (2014)
[http://www.ics.ac.uk/AsiCommon/Controls/BSA/Downloader.aspx?iDocumentStorageKey=5b70a7af-c79c-4e49-bca1-648b98c06598&iFileTypeCode=PDF&iFileName=ICS%20Tracheostomy%20Standards%20\(2014\)](http://www.ics.ac.uk/AsiCommon/Controls/BSA/Downloader.aspx?iDocumentStorageKey=5b70a7af-c79c-4e49-bca1-648b98c06598&iFileTypeCode=PDF&iFileName=ICS%20Tracheostomy%20Standards%20(2014))

Kelly M, Gillies D, Todd DA, Lockwood C. 2010 Heated humidification versus heat and moisture exchangers for ventilated adults and children. *Cochrane Database of Systematic Reviews*, Issue 4. Art. No.: CD004711. DOI: 10.1002/14651858.CD004711.pub2.

Mitchell, R. B., Hussey, H. M., Setzen, G., Jacobs, I. N., Nussenbaum, B., Dawson, C., ... & Merati, A. (2013). Clinical consensus statement: tracheostomy care. *Otolaryngology--Head and Neck Surgery*, 148(1), 6-20.

Morris, L & Sherif Afifi, M. Tracheostomies. 2010 The Complete Guide. Springer Publishing Company.

Nakanishi, N., Oto, J., Itagaki, T., Nakataki, E., Onodera, M., & Nishimura, M. (2019). Humidification performance of passive and active humidification devices within a spontaneously breathing tracheostomized cohort. *Respiratory care*, 64(2), 130-135.

Rozsasi, A., Leiacker, R., Fischer, Y., & Keck, T. (2006). Influence of passive humidification on respiratory heat loss in tracheostomized patients. *Head & neck*, 28(7), 609-613.

Scheenstra R.J., Muller S.H., Vincent A. et al. (2011) Heat and moisture exchange capacity of the upper respiratory tract and the effect of tracheotomy breathing on endotracheal climate. *Head Neck* 33, 117-124

Wilkes AR. Heat and moisture exchangers and breathing system filters: their use in anaesthesia and intensive care. Part 1 - history, principles and efficiency. *Anaesthesia* 2011;66(1):31-39.

Wilkes AR. Heat and moisture exchangers and breathing system filters: their use in anaesthesia and intensive care. Part 2 - practical use, including problems, and their use with paediatric patients. *Anaesthesia* 2011;66(1):40-51.

Wong, Shakir, C.Y.Y, Farboud, A.A, Whittet, H. B. (2016). Active versus passive humidification for self-ventilating tracheostomy and laryngectomy patients: a systematic review of the literature. *Clinical Otolaryngology*.

Authorised/endorsed by:

Tracheostomy Policy and Procedure Review Committee

Primary Person/Department Responsible for Document:

Tanis Cameron, TRAMS Manager