TRACHEOSTOMY REVIEW AND MANAGEMENT SERVICE (TRAMS)

CLINICAL GUIDELINE

TRACHEOSTOMY RELATED BLEEDING

Staff this document applies to:

- All Austin Health Sites
- Medical staff, Nursing, Physiotherapists and Speech Pathologists

Related Austin Health policies, procedures or guidelines:

- Mandatory Tracheostomy Equipment & Emergency Tracheostomy Management Poster
- Suctioning via the tracheostomy
- Tracheostomy Stoma Care
- Initiating a MET Call response
- Medical emergency review (MER) call
- Management of patients with a Tracheostomy
- Austin Hospital Escalation Response to Clinical Deterioration

Purpose:

Tracheostomy is a common procedure involving the placement of an artificial subglottic airway. It may be performed for a variety of reasons, including as part of the management of head & neck cancers, respiratory failure or neurological problems. While serious bleeding from a tracheostomy site is relatively rare, there are occasions where life-threatening erosion into a major vessel can occur. This document is intended to guide assessment and timely management of tracheostomy related bleeding.

Clinical Alert

- All bleeding from a tracheostomy site is potentially serious.
- An experienced clinician should be involved in evaluation at an early stage in all cases.
- The home team must be notified of the bleed and appropriately direct action for management and or investigation.
- The specialist surgeon or intensivist who inserted the tracheostomy should be consulted immediately and provide advice. Refer to Cerner for tracheostomy insertion documentation.

OPPIC Document ID: 13706 **Date of last major update: 23/08/2022** **Review Date:** 23/08/2025

Categorising Tracheostomy Related Bleeding

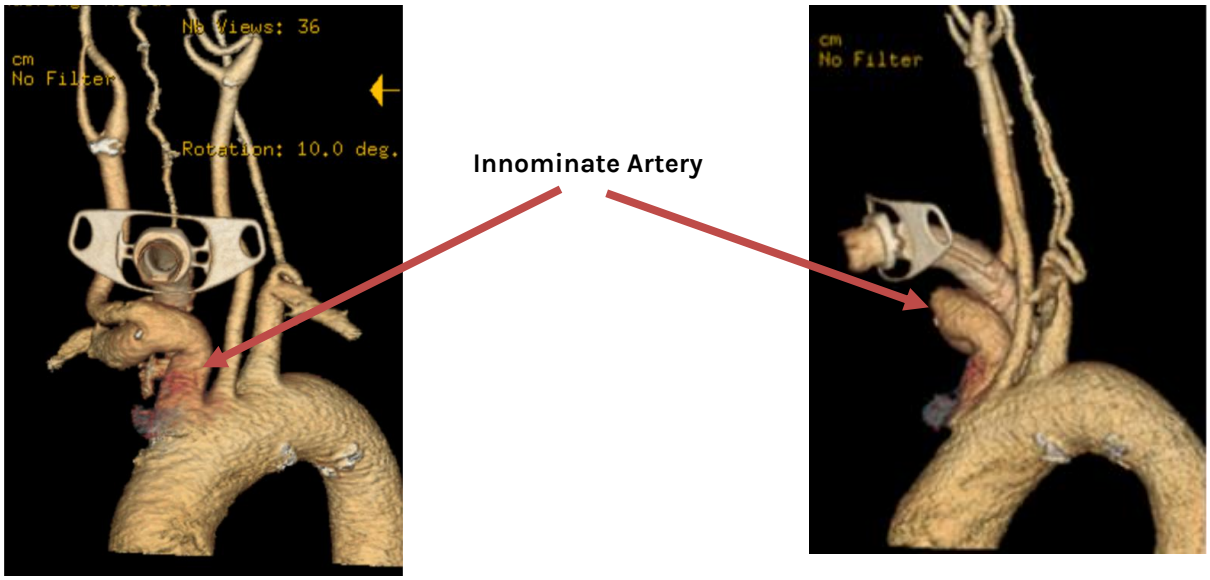
The potential causes for tracheostomy related bleeding depend very much on the time that has passed since the formation of stoma and tracheostomy tube insertion.

Early bleeding (< 4 days)

- Skin related bleeding
- Thyroid related bleeding
- Related to anticoagulant or antiplatelet therapy

Late bleeding (> 4 days)

- Mucosal trauma (e.g. from suction catheters)
- Granulation tissue
- Erosion into a large artery (e.g. tracheo-innominate fistula)



Pulsatile Tracheostomy Tubes

A pulsating tracheostomy tube may indicate close proximity to a large vessel, which in itself is a risk factor for a major haemorrhage. This constitutes an emergent review the first time it is detected, and, in all cases, an experienced clinician should be involved in evaluating it at an early stage. The primary treating team, and the specialist surgeon or intensivist who inserted the tracheostomy must be notified of the pulsatile tracheostomy tube and appropriately direct action for management and/or investigation. If bleeding is noted from a pulsatile tracheostomy tube, the clinical teams should consider a CT angiogram to assess proximity to the innominate artery.

Tracheostomy Bleeding & Actions

Small volume bleeding via the tracheostomy and/or the stoma may be a precursor of a major haemorrhage and the treating clinician must always thoroughly assess and give consideration to the possibility of a tracheo-innominate artery fistula.

Tracheo-innominate artery erosion is a rare late complication associated with a high mortality rate. Erosion occurs in less than 1% of tracheostomy cases and is usually associated with:

- Low placement of tracheostomy tube
- Excessive movement of the TT
- Over inflation of the cuff
- Suboptimal tracheostomy tube positioning

OPPIC Document ID: 13706 **Date of last major update: 23/08/2022** **Review Date:** 8/23/2025

	Immediate Actions	Consider
Small Volume Bleed If < 10mls of bright blood (e.g. blood contained within dressing or on suctioning)	• Activate the "Urgent Clinical Review" process • Measure vital signs • Discuss with specialist surgeon or intensivist who inserted the tracheostomy tube	• CT/CT angiogram to assess proximity to innominate artery. If CT angiogram confirms close proximity, consider early decannulation (risk vs benefit)
Major haemorrhage/ Suspected arterial erosion If > 10mls of bright blood (e.g. stoma dressing soaked and blood leaking beyond dressing) or continuous active bleeding and/or associated hypoxaemia or respiratory distress	• **Activate RESPOND BLUE** • Inflate cuff • Sit the patient up • Administer supplemental oxygen via tracheostomy • Ensure functional wide-bore IV access • Monitor vital signs • Notify the surgeon/ intensivist responsible for the insertion of the tracheostomy	• Hyper-inflation of the tracheostomy cuff and/or • Direct digital compression of the bleeding point

If a major haemorrhage/suspected arterial erosion occurs, the patient must have their airway secured by a clinician with advanced airway skills (specialist airway responder) and be transferred to the operating room or interventional radiology suite for further evaluation and intervention. Further investigations and interventions will be at the direction of the treating Intensivist and Thoracic/ENT/Maxillofacial surgeon involved.

If the cuff is inflated, **do not deflate cuff** until expert clinical assistance is available as it is possible the inflated cuff is tamponading the blood vessel.

TRAMS collects data on tracheostomy adverse events. Please notify TRAMS by phone extension 3095 or via Cerner referral.

Document Author/Contributors:

Original authors: Dr Stephen Warrillow, Director, Intensive Care Unit; Dr Liam Hannan, Respiratory and Sleep Physician, TRAMS Medical Consultant; Dr James Ward, Respiratory and Sleep Physician; Kristy McMurray, TRAMS Clinical Nurse Consultant

Updated August 2022 by: Renee Bartlett, TRAMS Clinical Nurse Consultant and Dr Naomi Atkins, TRAMS Medical Director.

Contributors: Dr Stephen Warrillow, Director, Intensive Care Unit; Dr Naomi Atkins, Respiratory and Sleep Physician, TRAMS; Caroline Chao, Senior Physiotherapist, TRAMS & VRSS

Legislation/References/Supporting Documents:

Bontempo, L. J., & Manning, S. L. (2019). Tracheostomy emergencies. *Emergency Medicine Clinics*, *37*(1), 109-119.

Chauhan, J., Hertzog, J., Viteri, S., & Slamon, N. (2019). Tracheoinnominate artery fistula formation in a child with long-term tracheostomy dependence. Journal of Pediatric Intensive Care, 08(02), 096–099. https://doi.org/10.1055/s-0038-1672153

Donaldson, L., Raper, R. (2019). Successful emergency management of a bleeding tracheoinnominate fistula. BMJ Case Reports CP 12;e232257

Reger, B., Neu, R., Hofmann, H.-S., & Ried, M. (2018). High mortality in patients with tracheoarterial fistulas: clinical experience and treatment recommendations. Interactive Cardiovascular and Thoracic Surgery, 26(1), 12–17. https://doi.org/10.1093/icvts/ivx249

Qureshi, A. Z. (2018). Fatal innominate artery hemorrhage in a patient with tetraplegia: Case report and literature review. The Journal of Spinal Cord Medicine, 1-4. doi:10.1080/10790268.2017.1417802

Gray M.C., Mohan S. G, Suxena A., Selvakumar S. The role of innominate artery ligation in the management of massive haemorrhage from tracheo-innominate artery fistula. Anaesthesia and Intensive Care March 2014;42 266-267

Wang, X.-l., Xu, Z.-g., Tang, P.-z. and Yu, Y. (2013), Tracheo-innominate artery fistula: Diagnosis and surgical management. Head Neck, 35: 1713-1718. doi:10.1002/hed.23211

Seidman, P A; Goldenberg, D and Sinz, E H (eds) Tracheostomy Management: A Multidisciplanary Approach; (2011) Cambridge University Press

Grant CA, Dempsey G, Harrison J, Jones T. Tracheo-innominate artery fistula after percutaneous tracheostomy: three case reports and a clinical review. British Journal of Anaesthesia 2006;96:127–31

Schaefer, O. P., & Irwin, R. S. (1995). Tracheoarterial fistula: an unusual complication of tracheostomy. Journal of intensive care medicine, 10(2), 64–75. https://doi.org/10.1177/088506669501000203

Endorsed by:

- Dr Stephen Warrillow, Director, Intensive Care Unit
- TRAMS
- A/Prof Mark Howard Director Victorian Respiratory Support Service;
- Mr Matthew Campbell, Director ENT Service;
- Mr Simon Knight, Director Thoracic Surgery;
- Mr Nicholas Rutherford, Director Maxillofacial Surgery;
- A/Prof Laurence Weinberg – Director Anaesthesia
- Nursing Standards Committee;
- Clinical Policy and Procedures Committee
- Deteriorating Patient Committee

Document Owner /Person Responsible for Document:

Prue Gregson, Manager TRAMS