



SECTION 7: CARE OF THE CHILD WITH A RESPIRATORY CONDITION

7.4 Care of the Child with a Tracheostomy Tube

7.4.0 Tracheostomy Overview: Tube Brands, Brands Substitution, Airway Profile and Consumables

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[Ward Supplies](#): Tracheostomy Tube Imprest List

Aims

1. To prevent complications e.g. airway obstruction and infection.
2. To provide the child and family with the knowledge and skills to care for the tracheostomy at home.
3. To promote growth and development so that the child may reach his/her full potential.

Key Points

- All documents contained within PNPM Section 7.4 are supplemental to each other. Nurses caring for children with a tracheostomy need to be familiar with the content of each document.
- All nursing staff must work within their scope of nursing practice ([Preface 6](#)). It is their responsibility to know the limits of their practice relating to care of the child with a tracheostomy and to seek advice from senior nursing and/or medical staff to ensure the best outcome for the patient.
- With any tracheostomy there is an increased risk of respiratory emergency. The nurse who cares for a child with a tracheostomy must be aware of potential complications and know what to do in an emergency. [PNPM 4.6](#) and [7.4.9](#).
- Mandatory Equipment for Tracheostomy Patient's MUST be kept at the bedside and with the child during transport. See [PNPM 7.4.1](#).

GENERAL INFORMATION ^{1, 2}

Children require a tracheostomy for a variety of reasons e.g. subglottic stenosis, ventilation dependence, tracheo-bronchomalacia, aspiration or vocal cord paralysis. Many children require a tracheostomy for several years and these children often have multiple medical conditions which require input from several specialties. Allocation of a Primary Nursing Team can facilitate delivery of well-coordinated care.

The creation and ongoing management of a tracheostomy can be very frightening for both the family and the child. Early and comprehensive discharge planning and referral to appropriate members of the multidisciplinary team will facilitate a smooth transition from hospital to home. In addition to the ENT team members may include:

CNC Technology	Dietetics	Ambulatory Care
Dependent Children	Social Worker	Coordinator
Respiratory/Gen	Occupational Therapists	Patient Appliance Centre
Paediatrics	HITH/Post Acute Care	Community Health Nurse
Speech Pathologist	Consumables Coordinator	
Physiotherapist		

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TRACHEOSTOMY TUBE BRANDS ³⁻⁵

Shiley[®]



These are the most common brands used at PMH. They are available in **Neonatal (NEO)** or **Paediatric (PED)** and Adult ranges. The size indicates the internal diameter of the inner cannula in millimetres. NEO tubes are shorter in length than the PED tubes and are not interchangeable. These tubes are *single use* only and are changed weekly.

Bivona[®] Silicone Tubes

These are soft silicone tubes available in almost identical lengths and sizes (Neo and Paed) to the Shiley NEO and PED range. Bivona tubes can be left in place for longer periods and changed at least every 28 days.

Most have metal reinforcement within the inner cannula. **Tubes containing metal must be changed prior to Theatre, MRI or radiation therapy.**

Bivona tubes are *single patient* devices and can be cleaned and reused in hospital and home. Refer [PNPM 7.4.8](#). The tubes can be sterilised for use on the same patient.

Bivona Neo:



Bivona Flextend:



Portex[®]

These tubes are rarely used and have a more acute angle and are usually longer than Shileys. Their shape may be suited to some patients. The edges of the neck plate can be sharp and cause trauma.

Shiley[®] / Portex[®] Double Lumen Tubes. (Refer [PNPM 7.4.11](#))

These are not available in inner cannula (IC) sizes smaller than a 5.0mm. An advantage of these tubes is that a blockage can be resolved by removing the inner cannula (IC), whilst leaving the outer cannula in place to provide a patent airway.

Shiley[®] / Portex[®] Fenestrated Tubes. (Refer [PNPM 7.4.11](#))

A fenestrated tube has one or more holes in the outer cannula. A fenestrated and non-fenestrated inner cannula is provided. These tubes are for intermediate or long term use to promote phonation and more normal laryngeal growth. They are contraindicated in the early postoperative period. As they require an outer and inner cannula, they are not available in sizes smaller than a 5.0mm.

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Adjustable Length Tubes

The inner cannula length can be adjusted to accommodate unusual anatomy or pathology. They are for short term use only until the correct length tube can be acquired. Preferably not used in the home setting.



Custom Made Tracheostomy Tubes

These are designed and ordered to meet a child's specific needs. These tubes are **NOT** a Single Use Device and must be cleaned as per [PNPM 7.4.8](#).

Brand Substitution

- **Uncuffed** Bivona PED and NEO tubes can usually be substituted by a Shiley PED or NEO tube i.e. at the bedside the same size and smaller tubes do not need to be the same brand. This requires consideration of why the child is using a Bivona brand tube. i.e. where patients have opted for the Bivona brand due to the longer change interval versus use of a tube for a property of the Bivona that meets airway and respiratory complications.
- Bivona Aire **Cuffed** tubes can be substituted with the Shiley Cuffed PDC tubes.
- If unsure or require further advice contact CNC TDC or ENT.

- **Exceptions**

Children that use Bivona for a specific functionality rather than the longer change interval should not have their tube substituted, i.e.

- Bivona Custom Made tubes – designed to overcome anatomical or physiological issues
- Adjustable Length Tubes – used temporarily to overcome anatomical or physiological issues
- Bivona Flextends –used for the benefit of their extra external length
- Bivona TTS cuffed tubes –cuff completely retracts onto the IC for ease of insertion and removal
- Portex, Shiley PDL tubes will require consultation re brand substitution
- Adult Bivona tubes Hyperflex (flexible shape IC) versus curved tubes may not be interchangeable due to the shape they maintain in the child's trachea

Tube Supplies

- PICU and Theatre now have a supply of **Cuffed** Shiley PED and NEO tubes 2.5mm to 5.5mm.
- The TDC cupboard has a limited supply of tubes. It is essential that the CNC is notified that these tubes have been removed and that the ward replaces them.
- Refer to the [Appendix](#) for locating tracheostomy tubes from ward areas.

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TRACHEAL DILATORS ⁶

- Kept at the patient's bedside for the **first 3 weeks** following formation of a tracheostomy and for children with **Non Patent Upper Airway** (when in hospital).
- Dilators are used in an emergency situation only by an ENT Specialist or Medical Officer trained in their use.
- Available from ICU resuscitation trolley and Technology Dependent Children's Equipment Cupboard in Paediatric ≤ 8yrs and Adult sizes >8yrs (some are one size fits all).
- Tracheal dilators are not usually sent home with a child.

TRACHEOSTOMY TAPES/BEAD CHAINS

- Refer to [PNPM 7.4.4](#) Changing Tracheostomy Tapes and Bead Chains.
- Spare chains and wire cutters are available in the Technology Dependent Children's equipment cupboard if required after hours.
- For more information click on the following links:
[Technology Dependent Children Equipment Cupboard](#)
[Tracheostomy Bead Chains](#)

HUMIDIFICATION ^{4, 7}

Heat Moisture Exchange: HME (or Swedish Nose)

- When breathing via a tracheostomy tube, air bypasses the nose that functions to warm, moisten and filter inspired air. Artificial humidification is necessary to ensure this still occurs. Tubes capture the expired humidity in the breath and therefore may appear moist.
- Lack of humidification can lead to thick secretions or plugs, damage to epithelial lining. During changes in seasons or during sudden hot or cold spells, children are more prone to have changes in their secretions. This is noted particularly in children at home. Parents should be alerted to this and addressed during parent education training.
- Disposable Heat and Moisture Exchangers (HME's), often called a Swedish Nose, are used. Secretions can be removed from the HME using swabs or tapping onto a cloth. If the HME becomes saturated with secretions it will be ineffective and should be changed.



Humid-Vent[®] Mini & Mini with Oxygen

- Indicated for infants weighing <10kg. The single filter paper will adequately humidify an infant's breath.

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- Maximum O₂ flow is **3-4L/minute**. Flows higher than this result in only a very small increase in available oxygen due to the resistance of the oxygen tubing. This size also has the smallest dead space to minimise rebreathing of CO₂.
- If a small child needs to use the next size HME, close observation of respiratory effort and CO₂ is required.
- Mini with Oxygen – made to order via the critical care technician after consultation.



Trach Vent[®] and Trach Vent+[®]

Once an infant weighs $\geq 10\text{kg}$ the Trach-Vent or Trach-Vent+ is usually tolerated. Some children with small tidal volumes however may not tolerate changing to this type of HME due to its increased dead space.

Preparing for a HME size change:

- Initially trial the child at the new size. Assess oxygen saturation and work of breathing to ensure it is tolerated before changing the size. **Note:** A larger size may also increase the tendency for dislodgment in younger children.
- **Maximum flow** through the Trach Vent+ is approximately **8-10L/minute**. Flows beyond this are not likely to increase oxygen availability for the child to breathe as most of the flow will escape to the environment. Alternate respiratory intervention and oxygen delivery should be sought at this level of oxygen requirement.

Tracheostomy Bib

- A tracheostomy bib is a specialised foam constructed bib that sits over the tracheostomy and traps the moisture in expired air. Upon inspiration the foam moistens and warms the air that passes into the airway. This device is not as effective as a HME but is an alternative for the child who will not keep the HME in place.

NEBULISATIONS

- Tracheostomy masks are available in a paediatric and an adult size. Administration of nebulised sodium chloride 0.9% may be effective for patients with thick secretions.



SPEAKING VALVES (SV)²

Speaking valves can only be used on the approval of the ENT specialist and after the patient has been assessed by speech pathology to ensure the upper airway is adequate for expiration only.



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- The speaking valve fits over the tracheostomy tube and during expiration the one-way valve closes to divert the air to the upper airway and vocal cords.
- This assists the child to vocalise more easily and clearly, as well as promoting growth of the larynx, reducing secretions, and facilitating normal coughing and sneezing.
- The replication of normal oropharyngeal pressures helps to facilitate the normal swallowing mechanism. Older children may also be taught to breathe in, place a finger over the tracheostomy tube, and speak.
- The improved sense of smell also helps to increase appetite.

Contraindication

- A speaking valve **cannot** be used on an unfenestrated tube with the cuff inflated.

AIRWAY PROFILE (AP) ⁶

All children in Western Australia will have an Airway Profile which is accessible via the CAHS intranet: click [Here](#): **Username**: airway **Password**: profile

- The left side of the AP has the size of the child's tracheostomy tube (unless it has been changed very recently) and the appropriate smaller size tube. Not every tube has an immediate smaller size tube and the TDC Nurse will have calculated this if required.
- Use only the most current version from the intranet. Check the date on the bottom if unsure which is the most current copy.
- If any changes have been made that aren't reflected on the patient's airway profile contact the CNC for Technology Dependent children.
- Laminate the child's **current** Airway Profile and hang at the bedside. Do not store in patient's file.

Terms Used in the Airway Profile

Patent Upper Airway: Specifies whether the child can breathe through their oro/nasopharynx above the tracheostomy.

Completely Tracheostomy Dependent (CTD): Added to the AP if it is thought the child is unable to breathe if their tube is displaced. If there is no known reason a child cannot breathe through their stoma CTD will not appear on the AP.

Difficult Intubation: Added as required.

Minimum Suction Depth: the suction catheter depth extending 0.5cm beyond the child's specific tracheostomy tube.

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Deep Suction: This is usually measured by examining a chest X-Ray or following a tracheoscopy. Refer [PNPM 7.4.3](#) for children who regularly require deep suction to clear secretions

Bivona/Shiley indicates acceptable brand substitution: Added to the Airway Profile where brand substitution is appropriate.

DISCHARGE PLANNING FOR A CHILD WITH A NEW TRACHEOSTOMY ²

Discharge criteria

- Family members and/or carers that will be responsible for the care of the child at home will need to complete Tracheostomy CPR competencies before discharge from hospital. Education can be provided by nurses who have up to date Basic Life Support (BLS) skills and the required tracheostomy competencies and skills ([see PNPM 4.4](#)). Advice should be sought from the CPR Educators and/or the CNC TDC for children with complex airways for an individualised plan.
- Discharge from hospital is usually possible as soon as parents/caregivers are competent to provide care and feel confident and comfortable to do so.
- Provide parents/carers with the following brochure as early as possible: [‘Tracheostomy Home Care: A Guide for Parents and Carers’](#) which includes Parent/Carer Competencies that can be used to guide the teaching process from the Intensive Care Unit to the ward).
- All children are to be referred to HITH/PAC prior to discharge for ongoing support at home.

Ordering supplies

- All children discharged should receive a disposable self-inflating bag and mask and parents/caregivers must be given instruction on their use.
- A [“Tracheostomy Discharge Supplies”](#) list is also available and lists all the equipment required prior to discharge. At least 2 weeks of supplies should be provided by the ward and sent home with the child.
- Provide the parent/caregiver with the contact number of the Consumables Coordinator (**0416 240 662**) so they can order ongoing supplies.
- Contact the CNC Technology Dependent Children to generate a supply template for the child. **Note:** Non metropolitan (country) patients should receive their ongoing consumables from their local hospital.
- Order home supplies as soon as the child’s needs have been determined. This may also enable the family to prepare their home for the child’s return, prior to discharge from hospital.

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Respite Care

- Respite care should be offered to the family and organised prior to discharge whenever possible. This may be arranged by staff or the family themselves. There may be some delay before respite can be provided due to the high demands on the particular centres.
- Centres providing respite care include:
 - Children’s Hospital Day Care Centre
 - Lady Lawley Cottage
- Other facilities or organisations can also provide support or household chores (Home and Community Care HACC).

Referrals

Referrals may also need to include:

- LINC Coordinator
- Ambulatory Care Coordination
- General Practitioner
- Child Health Clinic, Community Health or School Nurse
- Where patients are being discharged to a country area, the local hospital (or nursing post) must be notified. In addition to providing follow up care, it will be their responsibility to obtain consumables for dispensing to the family.

Other Support for Families

Parents of other children who have a tracheostomy may be willing to discuss home-management with the family of a child with new tracheostomy. Contact the CNC Technology Dependent Children to arrange this.

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Related policies, procedures and guidelines.
PNPM Section 7.4
PNPM 4.6 Emergency Resuscitation of a Patient with a Tracheostomy
Useful Resources
Tracheostomy Directory of Services
For information on the CATCH Program click here

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File Name and Path:	Tracheostomy Overview: Tube Brands, Brands Substitution, Airway Profile and Consumables https://healthpoint.hdwa.health.wa.gov.au/policies/Policies/CAHS/PNPM%2007.04.00%20Care%20of%20the%20Child%20with%20a%20Tracheostomy.pdf		
Document Owner:	CNC Technology Dependent Children		
Reviewer / Team:	CNC Technology Dependent Children; ENT		
Document Sponsor:	Nurse Director, Ambulatory Care Services		
Date First Issued:	January 1974	Version: 2	
Last Revised:	17 June 2014	Review Date:	17 June 2017
Endorsed by:	Paediatric Nursing Practice Committee	Date: 20 June 2014	
Standards Applicable:	NSQHS Standards: 		
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APPENDIX

Tracheostomy Ward Imprest List – Shiley Tubes (unless otherwise stated)

ED	5A	5C	9A	8A	6B	HiTH Mon - Fri 07.30-17.00 (in HiTH Store area)
3.0-5.5mm PED	3.0-5.5mm PED	3.0-5.5mm PED	3.0-5.5mm PED			3.0-5.5mm PED
A few inner cannula tubes (all non imprest)	4.0-5.5mm PDC (all non imprest)	3.0-3.5mm NEO	Various PDC (non imprest)	3.0-4.0mm NEO (all non imprest)	3.0-4.0mm NEO	3.0mm NEO
		May have miscellaneous Shiley or Bivona tubes		May have Shiley PDC or Bivona Flextends		2.5-5.5mm PAED Bivona
Consumables Co-ordinator can be contacted Monday & Friday via mobile (0416 240 662)						