

PAEDIATRIC NURSING PRACTICE MANUAL
SECTION 7

CARE OF THE CHILD WITH A RESPIRATORY CONDITION

7.4 CARE OF THE CHILD WITH A TRACHEOSTOMY

7.4.5 ROUTINE CHANGE OF THE UNCUFFED/CUFFED TRACHEOSTOMY TUBE

Aims

1. To ensure airway remains patent during tube change.
2. To prevent infection and build-up of secretions in the tube.

Introduction:

A child's first tracheostomy tube change usually occurs between day 5 and 7¹⁻³ and is undertaken by the ENT Registrar/Consultant who will confirm the formation of the stomal tract.⁴ Thereafter the tube can be changed by nursing staff who have the necessary knowledge, skills and experience to change a tracheostomy tube and be prepared to manage an emergency situation should complications/difficulties arise. ([Scope of Nursing Practice](#)).

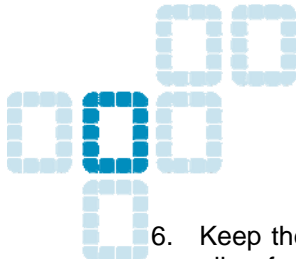
Complications:

Difficulties in inserting/reinserting a tracheostomy tube can occur at any time and may be due to:
4-6

- Child's head not in midline position, related to agitation/distress, coughing
- Stomal granulation blocking the stoma
- Tracheal granulation
- Oedema, short neck or obesity
- Small or closed stoma
- Tube has entered a false passage (into tissue between skin and trachea).^{7,8} If the cuff is inflated and/or manual inflation occurs this can compress the trachea and cause emphysema.^{4,7}

Key points

1. Routine tracheostomy tube changes require two people, one of whom must be a nurse experienced in changing a tracheostomy tube and who can delegate to their assistant appropriately. A competent parent may perform the tube change or assist the nurse. However, if a child is discovered without their tube in situ and in respiratory distress a competent nurse can replace the tube alone if help is not immediately available.⁵ (see additional points below).
2. **Always remove the tracheostomy tapes or chain prior to attempting to reinsert a tracheostomy tube.** In an emergency situation cut the tapes/chain. A tube inserted under tension is more likely to enter a false passage.^{6,12}
3. Use aseptic non touch technique for routine changing of a tracheostomy tube and care of the tracheal stoma.⁹
4. Insert the tube with the introducer in situ – unless an emergency situation outweighs this.⁵
5. Shiley® tracheostomy tubes are for single use only. However, never discard the tracheostomy tube unless a spare tube is *immediately* available at the bedside. Bivona® and custom made tubes are single patient use and can be cleaned and reused. See [PNPM 7.4.8](#) for cleaning instructions.

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6. Keep the introducer for the tube in situ at the bedside for use in an accidental decannulation and to allow for cleaning and reuse of the tube.^{6, 10, 11}
 7. Prepare the child/carer prior to routine tracheostomy tube changes:
 - Time the tube change at least **one hour** after milk/solids to minimise the risk of vomiting and/or aspiration.^{1-3, 6, 12-14}
 - Tracheostomy tube changes can be distressing to the patient. Ensure techniques to reduce stress such as age appropriate positioning, distraction techniques, play leader involvement and parent participation are used to minimise distress.^{1, 12} Ongoing distressing tube changes can lead to long-term behavioural issues that require significant input and therapy to overcome. Also refer to [PNPM 1.11](#) Clinical Holding.

Additional points

1. In the home although it is preferable that two people attend to tracheostomy changes, this may not always be possible.⁵ External agencies for example, Lady Lawley Cottage staff should be trained and practise tube changes with one person⁵ - as it is more likely the need will arise outside the hospital setting.

Tracheostomy Tube Change Intervals: For Pictures of Tubes [Refer 7.4](#)

Shiley® and Portex®	Interval
No Inner cannula ^{3, 14}	7 days
Inner Cannula +/- fenestration ^{15, 16} See PNPM 7.4.11 Suction and Care of the Tracheostomy with an Inner Cannula).	28 days

Bivona® : Change as instructed by CNC Technology Dependent Children. ¹⁴	
Interval is gradually increased over time: (guide only)	Interval:
First change:	7 days
Second Change:	10-14 days
Then up to:	21-28 days
Maximum interval	28 days
<ul style="list-style-type: none"> • The inner tube is assessed during cleaning for secretion build up to determine frequency of tube change. • Size 2.5, 3.0 and 3.5 tubes are usually changed every 7 days due to the smaller diameter having a higher risk of blockage¹⁴ 	

Mandatory Equipment for a Child with a Tracheostomy [Refer 7.4.1](#) and Prepare⁶

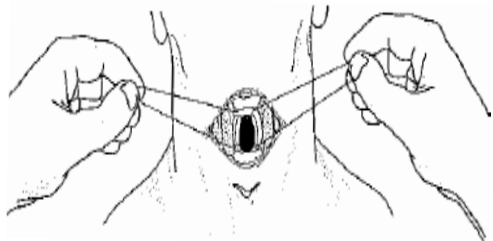

Shoulder Roll	Oxygen, suction and self-inflating bag and mask
Tracheostomy tube, same size	Normal Saline and syringes
Tracheostomy tube, size smaller	Suction catheters
Introducer for the tube in place	Water soluble lubricant
Spare tapes/chains	Suture cutter (if 1 st tube change)
Cloth (to wipe stoma/neck)	10mL Syringe if tracheostomy tube is cuffed

Additional equipment:

PPE. visor/goggles, non sterile gloves


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Routine Change of the Uncuffed/Cuffed Tracheostomy Tube
 Care of the Child with a Tracheostomy
 Paediatric Nursing Practice Manual (PNPM)
 Princess Margaret Hospital
 Perth, Western Australia

<p>Stay Sutures</p> <p>Following tracheostomy formation, Stay Sutures (inserted into the tracheal wall) may be gently pulled upward and apart to open the tracheal slit if the tube is difficult to insert.^{10, 15}</p> <p>Accidental decannulation in the first 72 hours is hazardous as tissue may close and prevent tube insertion.¹⁷ This is when stay sutures may be used to open tissue.</p>	
<p>Stay sutures are taped to the skin labelled 'Left' and 'Right' 'Do Not Remove' (see picture).¹⁰</p> <p>During the 1st tube change the Stay Sutures will be removed by ENT if a reasonable stomal tract has formed. Nursing staff can do this if requested.</p> <p>Reasonable tract formation usually takes at about 5-7 days.⁶</p>	

PROCEDURE	ADDITIONAL INFORMATION
<p>OXYGEN</p> <p>If the child is unstable, dependent on oxygen or a ventilator, increase oxygen 5-10 minutes prior to tube change.^{4, 6, 17, 18}</p>	<p>This will maximise oxygen reserves and decrease likelihood of desaturation during the period without oxygen.⁶</p>
<p>PREPARATION</p> <p>Determine appropriate change interval – refer to information above.</p>	<p>Consult the CNC Technology Dependent Children or parent for Bivona tubes.</p>
<p>Explain and prepare the child and family for the procedure.</p> <p>Ensure (if appropriate) that the child is aware tube removal and insertion is likely to causing coughing.^{4, 6}</p>	<p>Enquire what position the child's tube is usually changed in.</p> <p>To reduce anxiety and distress.</p>
<p>Perform hand hygiene.</p> <p>Prepare equipment using non touch technique.</p>	
<p>Open a replacement tube the same size as the one in situ.</p>	<p>See Airway Profile (click on Here) or check size on neck plate.</p>

PROCEDURE	ADDITIONAL INFORMATION
Insert and remove the introducer several times to ensure it can be easily removed. ¹⁰	Introducer in new tubes can often be tight to remove. Inserting the introducer avoids tissue damage to the trachea during insertion and stiffens some tubes. ⁶
Avoid touching the inner cannula of the tube.	To prevent contamination
CUFFED TUBES: ^{10, 11} Shiley or Bivona Aire Cuff Tubes – Prior to insertion inflate the cuff with 8-10 mL of air.	Ensure the cuff inflates evenly around the tracheostomy tube.
Bivona Tight to Shaft (TTS) Tubes Inflate the cuff with sterile water : <ul style="list-style-type: none"> • Paediatric 5mL • Adult 10mL If the cuff does not inflate completely/symmetrically squeeze the pilot balloon while massaging the cuff. If the cuff does not inflate symmetrically after a reasonable period of massage do not use - save the tube to return to the supplier.	
Assess the cuff for leakage over several minutes. Deflate the cuff completely.	
Shiley Tubes Gently smooth the cuff until it is as flat as possible against the tracheostomy tube.	Smoothing the cuff upwards (towards the neck plate) may assist with inserting the tube.
Attach a syringe pre-filled with air/water to the pilot balloon.	Allows rapid inflation of the cuff after insertion.
Place the unopened smaller tube within easy reach at arm's length.	The tube needs to be readily accessible if required.
Thread the tape/chain into same side of the neck plate as the Operator.	Having one side correctly pre threaded is safer, faster and easier, thereby reducing potential child anxiety/distress than threading both sides once the tube is inserted.
Attach the velcro end onto the tape in a similar position to the child's current tapes.	This will aid in faster securing of the new tape.

PROCEDURE	ADDITIONAL INFORMATION
<p>Lubricant</p> <p>A <i>small</i> amount of water soluble lubricant can be used to aid tracheostomy tube insertion.^{10, 11}</p> <p>This is only required if;</p> <ul style="list-style-type: none"> the tube does not insert easily or if there is a history of difficult tube changes. 	<p>If water soluble lubricant is used, ensure that the lumen of the tube does not become obstructed with lubricant.</p>
<p>Open/remove the child's shirt to ensure good visibility of the chest and stoma.⁶</p>	<p>Ensure adequate light.^{4, 6}</p>
<p>Positioning</p> <p>Position the child in the most developmentally appropriate position taking into consideration their clinical status and usual position.</p>	<p>Position only when completely set up and ready to remove and replace the tube.</p>
<p>Position infants swaddled with a rolled cloth under the shoulders to extend the neck.⁴</p> <p>Toddlers may prefer to sit on/across the lap with head held against an adult with the neck extended.⁴</p> <p>Older children may prefer to sit with the neck extended.⁴</p> <p>If child is unwell or desaturation is a concern use a supine position with shoulder roll.</p>	<p>A cloth roll placed under the shoulders assists to extend the neck and expose the stoma and tube.</p> 
<p>Obtain a baseline respiratory assessment.^{18, 19}</p>	<p>For later comparison.</p>
<p>If necessary, suction the tracheostomy tube.</p> <p>Do not insert a suction catheter directly into the stoma.</p>	<p>Refer PNPM 7.4.3. Suction of a Tracheostomy.</p>
<p>CLEANING THE STOMA</p> <p>Operator: Hold the tube in position with the thumb and second finger, palm touching chest.^{13, 20}</p> <p>Use the dominant hand and position yourself on that side of the child.⁶</p>	<p>Do not let go of the tube until the tracheostomy tube is secured.</p> <p>Do not push tube down into the trachea.</p> <p>Gently hold the neck plate against the skin to ensure the tube remains in place.</p>
<p>Assistant Remove the Velcro tapes/chains.</p> <p>Clean and dry the stoma and skin around the neck.</p> <p>Hold the tube in place while Operator cleans the other side of neck and stoma.</p>	<p>In an emergency cut the tapes/chains.⁴</p> <p>Refer PNPM 7.4.2 for information related to cleaning the stoma.</p>

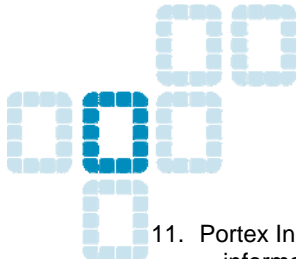
PROCEDURE	ADDITIONAL INFORMATION
<p>REMOVAL OF TRACHEOSTOMY TUBE:</p> <p>CUFFED TUBE ^{10, 11}</p> <p>Suction the patient's oropharyngeal areas as tolerated.</p> <p>Assistant: Deflate the cuff with a syringe just before removing the tracheostomy tube.</p> <p>Suction the tracheostomy tube to remove secretions released from above the cuff.⁴</p>	<p>It is essential to remove oropharyngeal secretions to reduce these moving into the trachea.</p> <p>Ensure the cuff pilot balloon is completely deflated.</p>
<p>UNCUFFED TUBE</p> <p>Operator ¹³</p> <p>On the count of 3, remove the tube gently with a smooth continuous motion of the hand away from child's chest.⁶</p> <p>Inspect the stoma for redness, granulation, bleeding, and abrasions.⁶</p> <p>Wipe away excessive secretions with a cloth.</p>	<p>Either the Operator or the Assistant can remove the tube.</p> <p>It is a normal reflex for the child to cough on removal.¹³</p> 
<p>INSERTION OF TRACHEOSTOMY TUBE:</p> <p>Always remove the tracheostomy tapes/chain prior to reinserting a tracheostomy tube.</p> <p>Wait for the child to stop coughing if possible</p> <p>Operator ¹³</p> <p>Holding the tube with the end of the tube pointing at the stoma, position the palm of the hand so that it nearly touches the child's chest in the midline position.</p> <p>Insert the tube using an inward and upward motion.¹²</p>	<p>A tube inserted under tension is more likely to enter a false passage Refer to Key Point 12.</p> <p>Trying to insert the tube whilst the child is coughing may be difficult.</p>  <p>Up to 5-10 seconds can elapse between tube removal and insertion in a non emergency situation and if the child is not dependent on ventilation.</p>
<p>Do not use force. If resistance is felt or bleeding is excessive report to Medical Officer and ENT.</p>	<p>Trauma to the stoma during a tube change can occur.</p>
<p>Remove the introducer immediately ¹² and hold the new tube in place until secured by the Assistant.</p>	<p>To secure the tube refer to PNPM 7.4.4 Changing Tracheostomy Tapes and Bead Chains.</p>
<p>CUFFED TUBE: ^{10, 11}</p> <p>Assistant: Inflate the cuff with air/water as soon as the tube is in place.</p>	<p>Inflate cuff to the desired volume. Refer PNPM 7.4.10 – Use Minimal Occlusion Volume Method for all Bivona TTS tubes and check cuff pressure using manometer as soon as practical for Shiley tubes.</p>

PROCEDURE	ADDITIONAL INFORMATION
<p>BREATHING:</p> <p>Look, Listen and Feel</p> <ul style="list-style-type: none"> • Chest rise and colour, • Listen for breath sounds, • Airflow from the tube. <p>If airflow is not present (child may be distressed +/- cyanosed) remove the tube and insert smaller size tube.¹³</p> <p>Reassess breathing.</p> <p>Page for MET assistance, or call a CODE BLUE at any stage.</p>	<p>An ungloved finger over the connector will allow assessment of airflow from the tracheostomy tube.</p> <p>Very rarely the tracheostomy tube may be inserted into a false passage. Airflow will not be felt from the tracheostomy connector if this occurs.</p> <p>Inform the ENT Registrar/Consultant immediately after inserting the tube and ensuring the child is stable.</p> <p>Refer PNPM 4.6 Emergency Resuscitation of a Patient with a Tracheostomy for ongoing management.</p>
<p>IF THE CHILD VOMITS DURING A TUBE CHANGE:</p> <ul style="list-style-type: none"> • Continue to insert tube and secure, • Position on to side, • Assess breathing, • Suction tracheostomy tube, <p>If concerned/respiratory distress following the tube change evaluate for aspiration.</p> <p>Advise medical staff.</p>	
<p>DIFFICULTY INSERTING THE TUBE:</p> <p>If there is a history of difficult tube insertions apply lubricant to the tip of the tube before insertion.</p>	<p>If the tube has been displaced for >30 minutes the stoma may have reduced in size.</p>
<ul style="list-style-type: none"> • Attempt re insertion using smaller size tube 	
<ul style="list-style-type: none"> • Reposition with neck extended, head and shoulders in the midline position. Allow child time to settle if possible 	<p>Difficulties may be related to the position of the child.</p>
<ul style="list-style-type: none"> • With your fingers either side of the stoma widen the opening and try to replace the tube 	<p>Do not apply force down onto trachea</p>
<ul style="list-style-type: none"> • Using the tip of the tube, sweep any stomal granulations to the side. 	<p>Stomal granulation should be treated promptly when noticed to prevent its growth to this stage.</p>
<ul style="list-style-type: none"> • Bronchospasm/malacia - allow child time to settle if possible between attempts. Refer PNPM 4.6 Emergency Resuscitation of a Patient with a Tracheostomy. 	

PROCEDURE	ADDITIONAL INFORMATION
<ul style="list-style-type: none"> False Passage is rare and can be assessed as air will not be felt coming out of the tube connector. 	Use of tracheal dilators by medical officer may be required.
Report any difficulties in tube change to the ENT team.	For further investigation.
FOLLOWING INSERTION Suction the tracheostomy tube if required.	A small amount of blood can occur following a tube change. ⁶⁶ Refer PNPM 7.4.3 Suction of a Tracheostomy Tube.
Reassess breathing and circulation and document observations on the CEWT chart.	
Return oxygen to previous level.	
Reassure child and family.	
For cleaning the tracheostomy tube refer to PNPM 7.4.8	
Document tube change and suction on observation chart and Airway Profile. Record procedure in patient records.	

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