

Paediatric Tracheostomy Guidelines



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Equipment checks and cares for the child with a tracheostomy tube:

All equipment must be checked at the start of each shift.

Please sign when check or care completed;

Date/...../..... Ward	Day shift Signature	Night shift Signature
Easily observable bed space or 1:1 nursing in a cubicle		
Emergency Tracheostomy Box belonging to the child, with correct contents as listed inside the box lid		
TRACHE poster above bed space with appropriate information written on white board		
Suction equipment, wall mounted, tested and has working pressure up to 50kPa / 350mmHg		
Suction catheters, size appropriate, need to be in ample supply, yankeur suction catheter - correct size		
Gloves, one box, non-sterile, latex free and powder-free by the bed		
Container for rinsing through suction tubing using tap water, dated, must be changed every 24 hours		
Oxygen, wall mounted flow meter, functioning, oxygen tubing to reach far end of bed, tracheostomy mask		
Saturation monitor and probe if oxygen therapy is required		
Self-inflating bag/valve/mask must be available with 15mm swivel connector		
Humidification appropriate for that child's needs		
Change HME daily or when contaminated with secretions		
Yellow waste bag in bin to dispose of used suction catheters, gloves etc		
Communication equipment available - if necessary		
The older child needs to have the nurse call bell within easy reach at all times		
Tracheostomy tapes changed daily or when wet/dirty		
Tracheostomy stoma cleaned, neck creases inspected and new dressing applied daily or when wet/dirty		
Universal precautions should be applied when caring for a child with a tracheostomy (IC Policy IC01)		

Tape Changes

It is the Policy of the Royal Alexandra Children's Hospital (RACH) that the tracheostomy tube will be held securely in place using manufactured Twill Ties eg, those made by Marpac. It is essential that the tapes are secured by three knots at either side of the tracheostomy tube and that the tension of the ties is correct to prevent accidental tube dislodgement or decannulation. Parents, carers and staff will be taught to tie the tapes in the same way.

Velcro collars are not routinely used at RACH following severe untoward incidents in other centres.

Velcro collars are rarely used and should be used with great caution. It is possible for children who wear a Velcro collar to pull their tracheostomy tube out and this could lead to their death. If a Velcro collar is used it should only be for the older child with a very well established, long term tracheostomy. The Velcro collar must be the correct size to hold the tube securely. If the collar is too loose the risk of dislodgement or decannulation is very great. Be aware that the Velcro ties can adhere to the child's clothing, toys or bedding and the tube may be pulled out when this item is moved.

- 4 All paediatric tracheostomy tubes in the BSUH Trust will be secured using cotton twill ties. The security of the tracheostomy tube is a key principle in maintaining airway safety. Any child admitted to this hospital using a Velcro collar to secure the tracheostomy tube must have their Velcro collar replaced with cotton twill ties for the duration of that child's stay in BSUH Trust, because it has been noted that Velcro Collars are more easily undone by the patient or became attached to clothing/toys and have been associated with a higher rate of accidental decannulation.

If parents refuse to have their child's tracheostomy tube secured using cotton twill ties, the child's consultant must discuss this with the parent(s) or those with parental responsibility without delay, informing them of the dangers of using a Velcro collar. The consultant must explain that use of Velcro is against manufacturers' advice, and that there is a significantly increased risk of dislodgement, which has caused fatalities in other centres.

Should the parents decide to continue the use of the Velcro collar against the Consultant's advice, the Consultant will need to complete the form which can be found at the end of this document.

Tracheostomy tapes should be routinely changed daily or when wet / dirty. This allows for the stoma, skin and neck creases to be examined. Tape changes will be done by two experienced people, usually two nurses until the parents / carers are competent in the techniques involved and can safely verify the tube safety and security. (NMC, 2002)

The play specialist may be involved in preparing the child for the tape change and may be required for distraction therapy during the procedure. This will help reassure the child and provide optimal co-operation.

Babies and toddlers are usually swaddled during the tape change to maintain safety and security. All young children usually have their tapes changed whilst lying down so that the neck is slightly extended using a rolled towel under the shoulders, the stoma is exposed allowing easier access if emergency care is needed.

Some older children like to assist with the procedure by holding the tracheostomy tube in place and often prefer to be sitting up rather than lying down.

Equipment needed to change the tracheostomy tapes and dressing:

- Oxygen – checked and working, O2 mask, self-inflating bag/valve/mask
- Suction – checked and working, appropriate size suction catheters, yankeur Suction catheter
- Emergency Tracheostomy Box + contents for that named patient
- Personal protection – apron, gloves
- Gauze – 7.5 cm sq
- 0.9% Sodium Chloride ampoules, room temperature or warmed
- Spare cotton ties, any extra dressing being used
- Barrier cream eg. Sudocrem, Proshield or Cavilon
- Scissors – round ended
- Trachi dressing
- Rolled towel – to place under the shoulders to extend the neck and expose the stoma
- Blanket or sheet to swaddle baby or toddler to maintain safety during the procedure
- Child’s own comforter, dummy
- Play specialist to distract the older child
- TV or music for distraction

Action	Rationale
Two competent nurses or one competent nurse and experienced person e.g. parent/carer	To reduce the risk of tube displacement whilst the tapes are not secure.
Explain the procedure to the child and parent/carer.	To gain consent and co-operation and reduce the child’s anxiety /distress.
Decontaminate hands, put apron on and prepare dressing tray. Use universal precautions, goggles may be needed	To reduce the risk of cross infection to child and self.
Pull curtains around the bed space.	To ensure privacy.
Position child comfortably with their neck slightly extended using rolled towel, shoulders exposed, swaddled if necessary. Fig 1	This allows easier access and view of child’s tracheostomy stoma
Place clean tapes behind the child’s neck.	To facilitate procedure.
Assistant to hold tube in position using index and middle finger.	To reduce the risk of tracheostomy displacement.

<p>Tape changer should cut the tapes between the knot and the flange on the further side first and then the near side of the tube and carefully remove the dirty ties and the dressing.</p>	<p>To release the dirty ties and remove the old dressing.</p>
<p>Observe stoma site and neck creases. Clean stoma site with warmed saline and gauze, then dry. Clean neck creases with warmed saline and gauze, then dry. Ease new dressing into place around the tube over the stoma site and under the flanges of the tube.</p>	<p>To maintain hygiene and comfort and remove any debris. To observe the areas for infection or skin breakdown. Swab site for MC&S if concerned. Dressing aids comfort and absorbs exudate.</p>
<p>Thread the new tapes through the flange on the side further away from the tape changer. Tie the tapes using a knot and bow. Ensuring the tape is flat to the child's skin.</p>	<p>This will secure the tube on one side in preparation for the second side. Twisted tape will cause skin pinching and breakdown.</p>
<p>Thread tape through the near side flange, tie one knot and then a bow.</p>	<p>This will secure the tube temporarily on the second side in preparation for the tension check. It is easier to untie a bow rather than a knot.</p>
<p>Check tape tension by sitting the child up whilst the assistant continues to hold the tube securely. With child's head bent forward it should be possible to slip one finger comfortably between the ties and the child's neck. Fig 2.</p>	<p>This will allow the tapes to be checked for the correct tension for maximum security and comfort</p>
<p>Check tape tension by sitting the child up whilst the assistant continues to hold the tube securely. With child's head bent forward it should be possible to slip one finger comfortably between the ties and the child's neck. Fig 2.</p>	<p>This will allow the tapes to be checked for the correct tension for maximum security and comfort</p>
<p>If the ties are too tight or too loose lay the child down, undo the bow and readjust. Re-check the tape tension.</p>	<p>If tapes are too tight it can reduce venous return from the head causing sclera oedema. Tightness may also irritate the skin.</p>
<p>If the tension is correct, lie the child down and change the bows into three knots by pulling the loops of the bow through to create a second knot, then tie a third knot. Cut off excessive tape, leave 2cm.</p>	<p>By using the loops of the bow to form the second knot the tape tension will not be altered. To maintain security of tube and allow sufficient tape to grasp for next tape change.</p>
<p>Assistant may only release the tube when told to do so.</p>	<p>To maintain safety.</p>

Check the child is breathing comfortably after the procedure. Ensure that the child is safe.	To check the tube has not been dislodged or caused any respiratory irritation.
Clear away equipment according to Waste Policy and wash hands.	To minimise risk of infection.
Record the tape change in the child's health care records.	To maintain accurate records.
Check all equipment is replaced and restocked as necessary.	In preparation for next procedure.

Figure 1



Figure 2



Pictures courtesy of Great Ormond Street Hospital

Changing a tracheostomy tube

This should ideally be undertaken as an elective procedure. The first tracheostomy tube change is usually done after one week and is undertaken by the ENT surgeon. Successive tube changes are carried out by competent ward staff or ENT surgeons. Most tracheostomy tubes need to be electively changed every 28 days. The dirty tube can be cleaned and reused 5 times. The cleaned tube will be stored in a clean, clear plastic bag marked with the date cleaned, number of times used and stored in the child's Blue Emergency Tracheostomy Box.

Personnel trained and competent in the techniques involved in changing a tracheostomy tube must perform the tube change and this requires two people. (NMC, 2002)

Indications for tracheostomy tube change:

- Tubes should be changed every 28 days routinely
- Any tube that appears occluded, i.e. the child is having difficulty breathing and a suction catheter cannot be passed, should be changed immediately.

Equipment required for tracheostomy tube change:

- Emergency equipment available, oxygen, suction
- Emergency Tracheostomy Box
- Clean tracheostomy tube, same size, check expiry date
- Tracheostomy tube one size smaller
- Personal protection – apron, gloves, goggles – may be required
- 0.9% Sodium Chloride ampoule, gauze swabs
- Aquagel sachet
- Spare cotton tapes
- Trachi dress
- Scissors round ended
- 10ml syringe (for cuffed tubes)
- Rolled towel – to place under the shoulders to extend the neck and expose the stoma
- Blanket or sheet to swaddle baby or toddler to maintain safety during the procedure
- Child's own comforter, dummy
- Play specialist to distract the older child

Note: Tube sizes are usually identified by their internal diameter, the external or outer diameter can vary between makes (measurements are in mm). A larger external size may cause difficulties when changing the tube and this should be checked when the equipment is being assembled.

Action	Rationale
Two competent nurses or one competent nurse and experienced person e.g. parent/carer	To ensure patient safety and reduce distress to the child
Stop any feed prior to tube change or aspirate nasogastric tube if insitu prior to procedure	The airway is unprotected when the tube is removed. Stopping the feed or aspirating the NG tube will reduce the risk of aspiration
Explain the procedure to the child and parent with rationale for the tracheostomy tube change. Routine tube change should be performed between 9am and 5pm .	The child should give consent for the procedure (unless the child is too young, sedated, unconscious or the tracheostomy change is an emergency). Good explanation will significantly reduce the child's anxiety It is safer to perform the procedure when an ENT doctor is available just in case there is an emergency
Position child supine, comfortably with their neck slightly extended. The younger child will be lying down, swaddled with a rolled towel under their exposed shoulders. The older child may prefer to sit up.	Extending the neck allows for easier removal and insertion of the tracheostomy tube. The child should feel as relaxed and comfortable as possible to reduce anxiety
Decontaminate hands, put apron on and prepare dressing trolley or tray. Use universal protective equipment including facial protection and gloves.	To reduce the risk of contamination
Pre-oxygenate the child (if they are receiving oxygen) with 100% concentration for at least 2 minutes	During the tracheostomy tube change the child will not receive oxygen therapy therefore could be at risk of hypoxia
Two skilled practitioners should perform the procedure (one to hold the tube in place when not secured, whilst the second removes the old tube and inserts the new tube)	To enable the procedure to be as clean and swift as possible. The tube must be held securely as the procedure will cause coughing and the tube may be dislodged.
One person should open the new tracheostomy tube	To reduce the risk of contamination
Insert introducer and check it can be removed easily	To be familiar with removing the introducer prior to insertion to aid efficiency of procedure
If the tube is UNCUFFED continue:	(If the tube is CUFFED see below)
Lubricate the outer curve of the tracheostomy tube with water-soluble lubricant – eg aquagel	To facilitate insertion
Suction if necessary.	To remove secretions and reduce active coughing

Place new tapes behind the child's neck. Release the cotton tapes by cutting between the knot and flange and remove the old tapes and dressing. Observe stoma site and neck creases. Clean stoma site with warmed saline and gauze, then dry. Clean neck creases with warmed saline and gauze, then dry.	To maintain hygiene and comfort and remove any debris. To observe the areas for infection or skin breakdown. Swab site for MC&S if concerned. Dressing aids comfort and absorbs exudate.
Hold the new tube in the dominant hand by the flanges and position the tip near the child's neck.	To allow a swift change of tubes.
Gently remove the old tube following the curve of the tube and the child's neck.	To maintain comfort and minimise coughing.
Firmly and gently slide in the new tube following the curve of the tube and the child's neck. Immediately remove the introducer	To prevent damage to the trachea To allow the child to breathe.
Hold the new tube securely if the child is coughing. Assess air flow through the tracheostomy tube, the child's breathing pattern and colour. Suction if necessary.	To prevent dislodgement and subsequent second tube change.
Tie the tapes	To secure the tracheostomy tube.
Reapply oxygen (if required)	To prevent hypoxia
Ensure that the child is comfortable and breathing without difficulty	To reduce patient distress
Clear away equipment according to Waste Policy. Dispose of gloves and apron in clinical waste bin, decontaminate hands with soap and water.	To minimise risk of infection.
Record the tube change in the medical and nursing notes with time, date, size and type of tube including complications of the procedure.	Allows for accurate assessment and preparation for future tube changes
If the patient cannot breathe The tube has probably been inserted into the pre tracheal space. Remove the tube and reinsert as above	
If the tube cannot be inserted Call for help immediately – 2222. Follow the Tracheostomy BLS Algorhythm	
If the tube is CUFFED continue:	(If the tube is UNCUFFED see above)
If the tracheostomy is cuffed, check the cuff of the new tube by inflating and deflating it using the 10 ml syringe	To check for air leaks within the cuff

The second practitioner should suction before and after cuff deflation to remove secretions. When the patient stops coughing, release the tracheostomy ties. Remove the tracheostomy tube.	Removal of secretions facilitates patency of the airway and reduces the risk of aspiration once the cuff is deflated. The tube may be more difficult to remove when the patient is coughing as this may tense the neck muscles.
The first practitioner should insert the new tube with the introducer using an up and over action. The first practitioner should immediately remove the introducer. Ease new dressing into place around the tube over the stoma site and under the	To facilitate inspiration / expiration via the tracheostomy.
flanges of the tube. Secure the tapes and observe the child for signs of respiratory distress. Feel for respiration via the tracheostomy tube (air against hand) and observe chest movements. Auscultate the chest for equal air entry	Air flow will be felt via tracheostomy tube if it is in the correct position. To ensure that both lungs are inflating equally.
Re-inflate the cuff (if a cuffed tube is being used) and check the cuff pressures.	An inflated cuff reduces the risk of aspiration for patients who are unable to swallow saliva adequately.
Reapply oxygen (if required)	To prevent hypoxia
Ensure that the child is comfortable and breathing without difficulty	To reduce patient distress
Clear away equipment according to Waste Policy. Dispose of gloves and apron in clinical waste bin and decontaminate hands using soap and water.	To minimise risk of infection.
Record the tube change in the medical and nursing notes with time, date, size and type of tube including complications of the procedure.	Allows for accurate assessment and preparation for future tube changes
Observe the site for excessive bleeding and, if present, ensure cuff is inflated. Excessive bleeding should be reported to the attending physician	A small amount of bleeding is common due to trauma at the stoma site. An inflated cuff will prevent aspiration of blood. Excessive bleeding may require further treatment.
<p>If the tube cannot be inserted Call for help immediately</p> <p>2222</p> <p>Follow the Tracheostomy BLS Algorithm</p>	

Tracheal Suctioning

The upper airway warms, cleans and moistens the air we breathe. The tracheostomy tube bypasses these mechanisms, so that the air via the tube is cooler, dryer and not as clean. In response to these changes the body produces more mucus. The tracheostomy tube is suctioned to remove mucus from the tube and trachea to allow for easier breathing.

There may be large amounts of mucus production with a new tracheostomy. This is a normal reaction due to the irritation of the tube in the airway. The heavy secretions should decrease in a few weeks. The production of secretions tends to reduce the longer the tracheostomy has been in situ, but the child can sometimes find these secretions are difficult to clear, therefore suctioning is an essential part of their tracheostomy care.

Tracheal suction should only be performed if the child is unable to clear their own secretions and should not be a routine procedure.

Suction when indicated will help to:

- Maintain airway patency
- Prevent collapse of the lung due to small airways becoming blocked by secretion, and prevent potential risk of infections
- Maintain patient comfort

Frequency of suctioning will depend on the child's needs and will increase with respiratory tract infections, changes in weather, humidity, environment or increased exercise.

Too frequent suctioning may cause more secretions to be produced and complications. Frequency of suctioning should be documented in the evaluation of care.

Factors that should be assessed are:

- Child's ability to cough and clear their own secretions – having a tracheostomy prevents the child from increasing the intra-abdominal pressure sufficiently to always cough and clear secretions (Hooper 1996)
- The amount and consistency of secretions
- Child's oxygen saturation
- Diagnosed chest infection with productive secretions

Suctioning is an essential procedure, which is determined by the child's clinical condition and not at predetermined intervals. However it is not a procedure that should be taken lightly as it has both long and short term potential complications (Pritchard 2001, Czarnik 1991, Fiorentini 1992, Raymond 1995, Gemma 2002, Dellinger 2001, Spence 2003, Ahn 2003)

- Hypoxia
- Formation of distal granulation tissue/ulceration
- Cardiovascular changes
- Pneumothorax

- Atelectasis
- Bacterial infection
- Intracranial changes

Only personnel trained and competent in the techniques involved should perform suctioning of a tracheostomy to minimise the complications. **NMC, 2002.** Personnel should have been assessed by appropriate staff using the RACH Tracheal tube suctioning skills competency document.

Practitioners should be aware that some pre-term vulnerable infants, especially if they need > 40% inspired oxygen, may require pre-oxygenation prior to suctioning to minimise a potential hypoxic event (Sigler & Willis, 1985, Odell et al 1993, Pritchard et al, 2001).

Suction catheter – size calculation

To reduce the risk of tracheal damage and hypoxia an appropriate sized suction catheter must be used.

The size of the suction catheter depends on the size of the tracheostomy tube. If the suction catheter is too small it will not aspirate the secretions efficiently and if the catheter is too large it will block too much of the airway during suction, making the child bradycardic and reducing oxygen saturation levels. Ideally the suction catheter needs to be half the size of the lumen of the tube.

For the neonatal and paediatric patient the suction catheter should be no more than double the internal diameter of the tracheostomy tube.

E.g. 4.0mm tracheostomy tube will need 8Fg suction catheter.

For the larger size tube the suction catheter size is calculated by subtracting '2' from the tracheostomy internal diameter tube size and then multiply by '2'.

E.g. size 8mm tracheostomy tube: $8 - 2 = 6$ multiply this by 2 = 12
The suction catheter safe to use in this example would be a size 12Fg.

- **Mini-tracheostomies should use a maximum of 10Fg only**

Multiple-eye suction catheters produce less damage (Fiorentini 1992). The distal hole and side holes allow secretions to be collected without occluding the tracheostomy tube (Ahn & Twang, 2003).

The suction catheter should have graduated markings so the length can be measured prior to insertion into the tracheostomy tube. The length of the tracheostomy tube will be recorded on the white board at the head of the bed.

Catheters should be discarded if the distal end has been contaminated prior to insertion into the tracheostomy tube.

The suction catheter should be inserted into the tracheostomy to the depth of the tube, so that the distal hole of the catheter just extends beyond the end of the tracheostomy tube, any further would cause trauma, only then should suction pressure be applied and maintained as the catheter is withdrawn, (Brodsky et al 1987, Runton, 1992).

Day (2000), states 'it is not necessary to rotate the catheter in the fingers as withdrawal takes place if the preferred multiple eyelet catheters are being used'. Suctioning should be quick but effective and should not exceed 5-10 seconds (Sumner, 1990, Young, 1984, Toiles & Stone, 1990).

The suction catheter may be re-used immediately if further suction is needed, so long as secretions have not occluded the catheter (Scoble et al,2001).

0.9% Sodium chloride should not be instilled routinely (Blackwood,1999, Hudak & Bond-Domb 1996, Pritchard et al,2001, Ackerman & Mick, 1990, Scoble et al, 2001, Neill, 2001)

Equipment required for suctioning a tracheostomy:

- A functional suction unit – wall mounted or portable
Variable pressure
- Sterile suction catheters - size appropriate
- Gloves
- Container for tap water
- 10ml 0.9% Sodium Chloride ampoule, 2ml syringe in-case needed
- Yankuer suction catheter – size appropriate
- Yellow bag for disposal of waste

Suction pressure:

Suction pressure should be kept to a minimum to prevent trauma, hypoxaemia and atelectasis (Dean,1997, McElery 1996, Mowery,2002, Simpson 2001, Billau,2004, Young, 1984)

Neonate – pressure should be no more than 8-10Kpa (50-80mmHg)

Child - pressure should be no more than 16kPa (120mmHg)

Age of child	Approx tube size	Suction Pressures
Pre-term - 1 month	3.0	8 - 10 Kpa 60 - 75 mmHg
0 - 3 yrs	3.5 - 5.0	0 - 12 Kpa 75 - 90 mmHg
3 - 10 yrs	5.0 - 6.0	12 - 15 Kpa 90 - 112 mmHg
10 - 16 yrs	6.0 - 7.0	15 - 20 Kpa 112 - 150 mmHg

ICS,2008

Suctioning is not a painful or distressing procedure. If the child becomes distressed during suctioning then practitioners should revise their technique.

ACTION	RATIONALE
If suction indicated, collect equipment needed for the procedure	Ensure that the equipment is working correctly and ready for use, this should be checked at the start of every shift.
Choose appropriate size suction catheter. See suction catheter calculation	If the catheter is too large it will occlude the tracheostomy which may cause hypoxia, cardiac arrhythmias and severe distress to the child. If it is too small the secretions may block the catheter.
Explain the procedure to the child. Ensure the privacy of the patient during the procedure	This enables the child to give verbal/non verbal consent to the procedure. It will also allow the child to feel reassured. It is important to maintain the child's dignity.
Decontaminate hands, put on gloves, and apron if time allows – the child must not be made to wait for this	This will reduce the risks of cross infection
Monitor oxygen saturations before and during suctioning. Increase oxygen if necessary.	To maintain adequate arterial oxygen and to reduce the risk of hypoxia and arrhythmia
If the tube is fenestrated, the fenestrated inner tube should be changed to a non-fenestrated tube prior to suctioning	Suctioning with a fenestrated inner tube in situ can cause mucosal damage.
Turn on the suction apparatus and attach a sterile suction catheter. Ensure that the pressure is checked prior to use.	Lowest vacuum pressure possible should be used as high pressure can cause mucosal damage and atelectasis due to the negative pressure
Put glove on the dominant hand, only touch the sterile suction catheter with this hand. Do not apply suction at this point. Gently but quickly insert it into the tracheostomy tube to the measured depth	To reduce the risk of infection. Gentleness is essential. Damage to the mucosal area can cause trauma and infection.
Withdraw the catheter with continuous suction applied. Do not suction for more than 5-10 seconds (ICS, 2008)	Continuous suction is most effective in clearing secretions, but the catheter must be kept moving to reduce the risk of mucosal damage. Prolonged suction will result in hypoxia
Release the suction, remove the catheter and glove and discard, reapplying the child's oxygen supply immediately if used	To reduce the risk of further hypoxia and to restore oxygenation as soon as possible
Observe the child throughout the activity for any signs of distress or discomfort	To monitor the child's response/tolerance to suction therapy.
Observe and document colour, volume and consistency of secretions	This provides an indication of the child's condition, any changes that may be occurring e.g.: development of an infection
Rinse the suction tubing; excess water should not be left in the tubing	To clean the tubing to reduce the risk of cross infection

Change the suction tubing at least daily; ensure the suction container is not more than half full. Change the water for suction every 24 hours.	To reduce the risk of bacterial growth in the water and tubing
Using a fresh clean glove and sterile catheter repeat the procedure until secretions are cleared and the child is breathing comfortably.	To reduce the risk of infection, ensuring that the secretions are removed and that the child is comfortable
Allow the child sufficient time to recover between suction especially if the oxygen saturation is low (ensure pre-oxygenation) or if the child coughs several times	To reduce the risk of hypoxia, arrhythmias and reduce the child's distress
If secretions are tenacious give 0.9% saline nebuliser (needs prescribing) Speak to Medical Team or Physiotherapist if secretions are thick.	Nebulisers can help loosen secretions
Clear away equipment according to Waste Policy. Dispose of gloves and apron in clinical waste bin, decontaminate hands with soap and water.	To minimise risk of infection.

Difficulty passing the suction catheter should lead to consideration that the tube maybe partially blocked, badly orientated or misplaced and requires immediate attention. (ICS, 2008)

While the child is in hospital, suctioning is done by staff wearing gloves to avoid cross infection between patients.

Although it is best practice to follow these precautions, it is common practice in the community setting for parents/main carers caring for their child's tracheostomy tube to wash their hands and give suction using an aseptic non-touch technique.

Assessing Cuff Pressure

To be measured by trained personnel only

Action	Rationale
Every shift the cuff should be checked using a hand pressure gauge. Cuff pressure should be maintained between 15 and 25 cm H ₂ O unless directed otherwise	Too much pressure within the cuff can cause trauma to the tracheal mucosa. Too little pressure may mean that the cuff fails to make an adequate seal against the trachea and the patient is at risk of aspiration, or a severe leak develops causing hypoventilation.
Decontaminate hands using soap and water, wear apron and gloves.	To reduce the risk of cross infection
Connect the gauge by inserting the male luer connection into the female luer mount of the tube inflation line	To make the two chambers of the tube and gauge synonymous
Note the pressure indicated on the gauge	For documentation
To achieve a good seal, marginally over-inflate the tracheal cuff by a series of small depressions of the inflator bulb, and immediately – by means of the red button release the pressure to a point in the range indicated by the green section on the dial at which the seal is just achieved	To ensure the minimum volume of air is used to achieve cuff inflation
Dispose of apron and gloves in clinical waste bin, decontaminate hands using soap and water.	To reduce risk of cross infection.

Synchronised cuff deflation technique

This technique is used to prevent aspiration of secretions that may have collected above an inflated tracheostomy cuff.

The technique requires 2 personnel. As one person deflates the cuff, a second person (trained nurse) performs tracheal suction. The timing is crucial to prevent hypoxia (suction taking more than 10 seconds) and aspiration of secretions (cuff deflated too early, prior to suction).

Cuff deflation

Action	Rationale
See below for synchronised cuff deflation technique.	
Explain procedure to the child Sit the child upright.	To gain consent Optimum position
Decontaminate hands with soap and water. Put on apron and gloves also facial protection if possibility of splash	To prevent cross infection.
Assess respiratory status including oxygen saturation	To gain baseline information
Suction prior to deflation or encourage active cough	To clear secretions
Perform synchronised cuff deflation	To remove secretions that may have collected above the inflated cuff
Reassess child's respiratory status	To ensure child's comfort prior to continuation of procedure
Insert fenestrated inner tube if appropriate	This will improve air flow over vocal cords
Reassess child's respiratory status	The change from breathing through the tracheostomy will increase the child's work of breathing
Ask child to say "aah"	To assess quality and ease of voice production
Clear away equipment according to Waste Policy. Dispose of gloves and apron in clinical waste bin, decontaminate hands with soap and water.	To minimise risk of infection.
Monitor child for any signs of respiratory distress	This may indicate that the child is unable to tolerate procedure

Do not continue if one or more of the following occur:

- Constant drooling
- No swallow is observed
- Desaturation
- Respiratory or cardiovascular distress
- Fatigue occurs quickly
- Patient fails to protect their airway e.g.: audible pooled "wet" pharyngeal secretion

Reinflate the cuff after removing the speaking valve and document results.

If the child fails cuff deflation on 2 occasions refer the child for further speech and language assessment (SALT).

Speaking Valves

Valves that allow the child to speak when the **tracheostomy tube cuff is deflated** are a common method to facilitate communication once the child's respiratory state is stable in the weaning phase. They can also improve the child's ability to swallow oral secretions (saliva).

There are some contraindications for using speaking valves and these should be considered prior to a trial:

- Inability to tolerate cuff deflation
- Airway obstruction
- Unstable medical/pulmonary status
- Laryngectomy
- Severe anxiety / cognitive dysfunction
- Tracheal/laryngeal stenosis
- End stage pulmonary disease
- Excessive secretions

Speaking valves can be re-used for the same child. Clean (as per manufacturer's instruction) after use and store in a sealed and labelled container. If further information on speaking valves is required contact the SALT or Outreach team.

The child may not tolerate a speaking valve but speech may still be possible due to the leak around the tube when the cuff is deflated.

Procedure for using a speaking valve

Action	Rationale
Explain procedure to child to involve them where possible. Sit the child upright.	Optimum position
Decontaminate hands with soap and water, put on apron, gloves and facial protection if possibility of splash	To prevent cross infection.
Assess respiratory status Attach pulse oximeter	To gain baseline information
Suction trachea and oro-pharynx prior to deflation or encourage active cough	To remove pooled secretions.
If the cuff is inflated perform synchronised cuff deflation	To remove secretions that may have collected above the inflated cuff
Assess child's respiratory status	To assess for any change / deterioration in condition
For Tracoe tube if outer tube is fenestrated, insert fenestrated inner tube if appropriate	This will improve air flow over vocal cords
Reassess child respiratory status	The change from breathing through the tracheostomy to breathing via the upper airway will increase the work of breathing
Ask child to say "aah"	To assess quality and ease of voice production

Place speaking valve on tracheostomy tube Instruct the child to breathe in through the tracheostomy and out through mouth Ask child to count 1-5	This will aid child's "normal" swallow Aids the assessment of vocal quality by giving the patient purpose for speaking - listen to voice quality
Check the voice is clear and patient is breathing comfortably. Monitor child for any signs of respiratory distress	If there are gurgling noises, ask the child to cough and clear secretions. If this does not resolve gurgling remove speaking valve, re inflate cuff and inform speech and language therapist.
Commence with a 5-15 minute period using the speaking valve and assess respiratory effort and saturations (unless specific instructions given by SALT).	To build up time period of use to prevent the child becoming tired through the increased work of breathing
During this period use humidification as appropriate (via tracheostomy mask or Buchanan bib)	To provide the child with adequate humidification
After trial remove speaking valve, re inflate cuff and insert inner cannula (if applicable). Rest the child for at least 30 minutes and document findings.	To allow adequate rest period
Clear away equipment according to Waste Policy. Dispose of gloves and apron in clinical waste bin, decontaminate hands with soap and water.	To minimise risk of infection.
Extend the time using the speaking valve by 15-30 minute increments until the child can tolerate 4 hours or more – unless given child specific instructions from multi professional team	To build up time period of use gradually, to prevent the child becoming tired through the increased work of breathing
Remove the speaking valve at night. Decontaminate hands using soap and water, wear gloves and apron, remove the speaking valve and store safely. Dispose of gloves and apron in clinical waste bin, decontaminate hands with soap and water.	To reduce the work of breathing for the child. To reduce the risk of cross infection.

Following a successful cuff deflation, a weaning plan, individualised for the child, should be agreed. The aim is to increase the child's ability to tolerate cuff deflation, increase the use of the speaking valve and to progress to the removal of the tracheostomy tube. It is important to ensure the child's voice is present prior to removal of tracheostomy. This method encourages adequate vocal cord movement and good breath support for speech.

Once the child can manage 4 hours continuously with a speaking valve removal of the tube can be considered. For neurological patients this may be 24 hours. The multi-professional team caring for the child should decide when the tracheostomy tube should be removed.

For children with a permanent tracheostomy, an individual plan for commencing oral intake will be devised by the SALT.

Decannulation Procedure

This process is often initiated by the ENT surgeon or respiratory consultant during a review at an outpatient appointment.

The ability of the child to maintain their airway and clear secretions must be established before considering removal of the tracheostomy tube. The decision to remove the tracheostomy should be made by the multi-professional team including assessment by the medical, nursing, physiotherapist and SALT. The procedure should be undertaken by the ENT surgeon.

Tracheostomy tubes should not be removed if there is upper airway oedema or tumour, absent or inadequate cough and gag reflex, persistent dysphagia resulting in compromised airway protection, reduced ability to clear secretions.

The tracheostomy tube will be down sized so that the child becomes used to breathing around the smaller tube whilst being active or asleep at home. The child will then be admitted to PCC for a trial decannulation.

The optimum time to decannulate is when the child is rested and the process should be under the guidance of the ENT Consultant. The morning is preferable.

Royal Brompton & Harefield
NHS Foundation Trust



Great Ormond Street
Hospital for Children
NHS Foundation Trust

A joint competency document for staff and carers working with Long Term Tracheostomy Ventilated Children

1. Description of competencies and supporting information
2. Sign off records

These competencies have been developed by the Royal Brompton Hospital and Great Ormond Street Hospital and they describe the knowledge and skills required by carers to manage the care of a child with a tracheostomy and requiring long term ventilation.

This booklet is set out in two parts. The first part is a resource pack which covers in detail the information about the procedures and tasks relating to the care of a child with a tracheostomy and requiring long term ventilation. The second part is the core competencies. All these sections will need to be signed by a qualified professional who deems the carer competent. The carer will need to sign to say they feel confident and competent.

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Affix patient label or enter details:

Trust ID No.:

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Surname (BLOCK LETTERS):

First name:

D.O.B.:

Discussion with parents about the use of Velcro Collar.

All paediatric tracheostomy tubes in the BSUH Trust will be secured using cotton twill ties. Any child admitted to this hospital using a Velcro collar to secure the tracheostomy tube must have their Velcro collar replaced with cotton twill ties for the duration of that child's stay in BSUH Trust.

If parent(s)/or those with parental responsibility refuse to have their child's tracheostomy tube secured using cotton twill ties, the child's consultant must discuss this with the parent(s)/or those with parental responsibility without delay, informing them of the dangers of using a Velcro collar. The consultant must explain that use of Velcro is against manufacturers' advice, and that there is a significantly increased risk of dislodgement, which has caused fatalities in other centres.

Should the parent(s)/or those with parental responsibility decide to continue the use of the Velcro collar against the Consultant's advice, the Consultant must complete all of the following sections;

1. Details of the risks that have been discussed with the parents.

2. Details of what the family concerns are.

3. Details of the discussion with the parents/or those with parental responsibility about how to manage the security of their child's tracheostomy whilst in hospital.
