

young people

tracheostomy

tracheostomy

children

children

tracheostomy

Best Practice Statement ~ *September 2008*

**Caring for the child/young person  
with a tracheostomy**

children

young people

NHS Quality Improvement Scotland is committed to equality and diversity. We have assessed this Best Practice Statement for likely impact on the six equality groups defined by age, disability, gender, race, religion/belief and sexual orientation. For a summary of the equality and diversity impact assessment, please see our website ([www.nhshealthquality.org](http://www.nhshealthquality.org)). The full report in electronic or paper form is available on request from the NHS QIS Equality and Diversity Officer.

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## **Introduction**

NHS QIS' vision is of an NHS that achieves excellence in the care of every patient every time. It leads the use of knowledge to promote improvement in the quality of healthcare for the people of Scotland and performs three key functions:

- providing advice and guidance on effective clinical practice, including setting standards
- driving and supporting implementation of improvements in quality, and
- assessing the performance of the NHS, reporting and publishing the findings.

In addition, NHS QIS also has central responsibility for patient safety and clinical governance across NHSScotland.

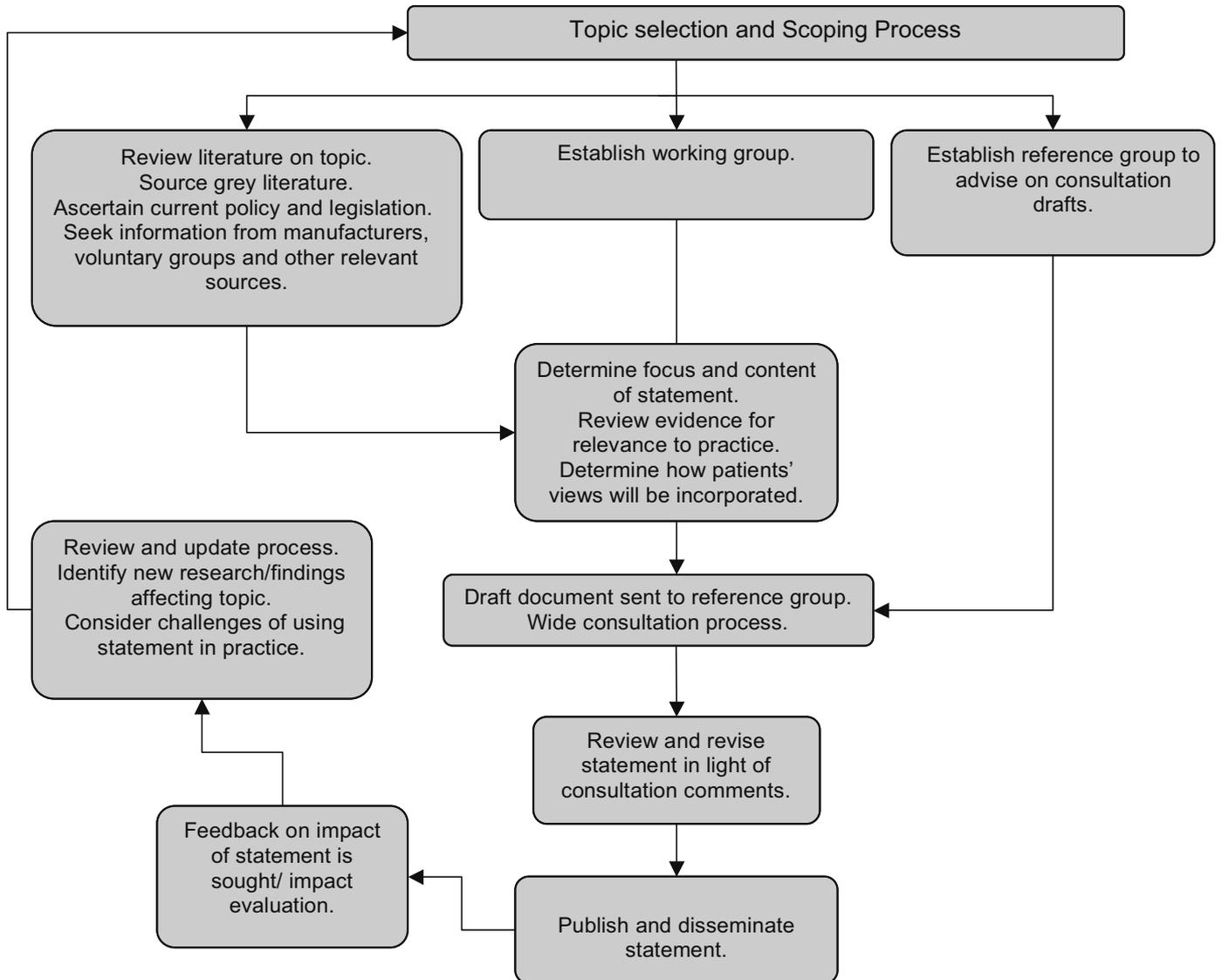
A series of best practice statements has been produced within the Practice Development Unit of NHS QIS, designed to offer guidance on best and achievable practice in a specific area of care. These statements reflect the current emphasis on delivering care that is patient-centred, cost-effective and fair. They reflect the commitment of NHS QIS to sharing local excellence at a national level.

Best practice statements are produced by a systematic process, outlined overleaf, and underpinned by a number of key principles.

- They are intended to guide practice and promote a consistent, cohesive and achievable approach to care. Their aims are realistic but challenging.
- They are primarily intended for use by registered nurses, midwives, allied health professionals, and the staff who support them.
- They are developed where variation in practice exists and seek to establish an agreed approach for practitioners.
- Responsibility for implementation of these statements rests at local level.

Best practice statements are reviewed, and, if necessary, updated after 3 years in order to ensure the statements continue to reflect current thinking with regard to best practice.

## Key stages in the development of best practice statements



### **Best Practice Statement: Caring for the child/young person with a tracheostomy**

In 2003, NHS QIS published the best practice statement caring for the patient with a tracheostomy<sup>1</sup>, which was relevant to adults and children/young people with a tracheostomy. NHS QIS has a commitment to review and, if necessary, update best practice statements every 3 years, therefore, an updated best practice statement of the same name was published in 2007<sup>2</sup>. However, during the review process the working group agreed that separate guidance for tracheostomy care was required for both adult and children/young people as the two varied greatly. Therefore the 2007 best practice statement focused on adult services only and a working group was convened to develop a separate best practice statement for healthcare professionals caring for a child/young person with a tracheostomy. As with the original, this statement does not refer to care of children/young people with a laryngectomy.

The reasons that children/young people may require a tracheostomy can be put into three broad categories: airway obstruction, unsafe airway/airway compromise and need for long-term ventilation. More specifically this can be due to trauma, burns, birth defects, inability to breath without a ventilator, neurological problems, neuromuscular problems, problems with the lungs (broncho/trachea malacia, bronchopulmonary dysplasia), or spinal injury.

The care of a child/young person with a tracheostomy is a highly skilled process requiring the knowledge and expertise of a multidisciplinary team including dietitians, physiotherapists, play specialists, specialist nurses, speech and language therapists and trained carers. The membership of the working group convened to develop the statement reflects this.

The working group recognises that the best practice statement focuses on the physical care of the child/young person with a tracheostomy and that psychological support for the child/young person and their parents/carers may also be required.

A section has been included in this statement to highlight the importance of play interventions, and although it is included in this best practice statement for tracheostomy care, the group feels that it could be adapted for other specialties. An audit tool has also been developed to support healthcare professionals and organisations that would like to audit current local practice and is included as an appendix and available on the NHS QIS website to download ([www.nhshealthquality.org](http://www.nhshealthquality.org)).

## Section 1: Education and training

### Key points:

- 1 *There are a number of children/young people with a tracheostomy both in hospital and in the community. NHS boards have a responsibility towards these children/young people and their families/carers and also for preparing healthcare professionals to care for them.*
- 2 *A family-centred approach, good communication skills and technical competence are required to care for, assure and assist children/young people and their families/carers in adapting to, and managing, a tracheostomy.*
- 3 *Children/young people and their families/carers require education and support in adapting to, and living with, a tracheostomy*

Statement	Reasons for statement	How to demonstrate statement is being achieved
<p>Healthcare professionals caring for a child/young person with a tracheostomy have access to:</p> <ul style="list-style-type: none"> <li>• education and training to meet local need, and</li> <li>• standardised local protocols or guidelines developed by local specialists and the multidisciplinary team with input from children/young people and their families/carers.</li> </ul>	<p>Healthcare professionals need to be equipped with the appropriate knowledge and skills to meet the unique needs of these children/young people and their families/carers competently and effectively.</p>	<p>There are local training and education opportunities for healthcare professionals to meet local need.</p> <p>There are local protocols or guidelines to support healthcare professionals caring for the child/young person with a tracheostomy.</p>
<p>Healthcare professionals who come into contact with a child/young person with a tracheostomy (no matter how infrequently) understand:</p> <ul style="list-style-type: none"> <li>• the particular indications for tracheostomy</li> <li>• risks associated with a tracheostomy</li> <li>• potential complications with a tracheostomy</li> <li>• the types of tubes and equipment involved in each case, and</li> <li>• the importance of standard infection control precautions (SICPs).</li> </ul>	<p>It is a professional responsibility to be able to address children/young people's needs competently.</p>	<p>There is documented evidence of education provided to develop and update knowledge of healthcare professionals working with children/young people with a tracheostomy.</p>
<p>Healthcare professionals and parents/carers who are in contact with a child/young person with a tracheostomy have access to, and receive, training on routine and emergency airway management for children/young people with a tracheostomy.</p>	<p>It is the professional responsibility of healthcare professionals to ensure they and parents/carers are prepared and competent to deal with emergency situations.</p>	<p>Audit of resuscitation training specific to children/young people with a tracheostomy which is tailored to local need.</p> <p>There is documented evidence that resuscitation training specific to children/young people with a tracheostomy is provided to families/carers.</p> <p>Staff personal development plans identify resuscitation training requirements for relevant professionals.</p> <p>Key staff identified locally as competent are readily available to attend to emergencies.</p>

Statement	Reasons for statement	How to demonstrate statement is being achieved
<p>Healthcare professionals know when to seek, and have access to, professional advice and assistance from relevant specialists on:</p> <ul style="list-style-type: none"> <li>• complex nutrition</li> <li>• chest physiotherapy</li> <li>• infection prevention and control</li> <li>• speech, language and communication</li> <li>• resuscitation</li> <li>• specialist equipment requirements</li> <li>• child development</li> <li>• airway/respiratory nursing, and</li> <li>• play.</li> </ul>	<p>Professional expertise/judgement/knowledge is required to identify the point at which it is appropriate to seek specialist advice, for example from physiotherapists, dietitians, and speech and language therapists based on the individual child/young person's needs.</p>	<p>There is evidence of clear lines of communication and agreed arrangements between the different healthcare professionals who may be required to provide care for the child/young person with a tracheostomy.</p>
<p>Healthcare professionals maintain competency in caring for a child/young person with a tracheostomy.</p>	<p>It is a professional commitment to maintain competency.<sup>3,4</sup></p>	<p>There is evidence of attendance at competency-based training and education provision for relevant healthcare professionals.</p> <p>Personal development plans reflect the level of competency achieved or required.</p>
<p>Prior (where possible) to a tracheostomy being performed, education and reassurance of the child/young person and their parents/carer starts and continues through the patient journey.</p>	<p>In addition to care, healthcare professionals are instrumental in inspiring confidence and offering support to children/young people with a tracheostomy and their families/carers.</p>	<p>Records of information given to children/young people and families/carers at particular stages of the patient journey are audited to demonstrate that appropriate information is conveyed effectively.</p>
<p>The education of children/young people and their families/carers, to know how to access ready advice and support, is necessary if children/young people with a tracheostomy are to live successfully in the community.</p>	<p>Families/carers of a child/young person with a tracheostomy who receive adequate education and support, as well as equipment, supplies, follow up, etc can be safely cared for out of hospital to live in the community.<sup>5,7</sup></p>	<p>The families/carers of children/young people with a tracheostomy in the community have contact details of the local and/or specialist team.</p>
<p>The education of families/carers and education staff and access to ready advice and support is necessary if children/young people with a tracheostomy are to safely achieve full-time education in school.<sup>8</sup></p>	<p>Children/young people with a tracheostomy have the right to access full-time education.</p>	<p>There is evidence of attendance at local training and education for healthcare professionals to meet local need.</p> <p>Records of information given to children/young people, families/carers and education staff at particular stages of the patient journey are audited to demonstrate that appropriate information is conveyed effectively.</p>

Statement	Reasons for statement	How to demonstrate statement is being achieved
An additional support plan should be developed for nursery and school pupils to identify the level of support that is required in those environments. This will include emergency guidelines.	It is important to ensure that everyone coming into contact with the child/young person with a tracheostomy is aware of their needs.	Additional support plans are audited to ensure that appropriate support for the child/young person is provided.

**Key challenges:**

- 1 *Development of local policies/guidelines relating to tracheostomy education and training.*
- 2 *Sharing education and training information with the acute and community multidisciplinary team.*
- 3 *Identification of the education and training needs of a diverse group of healthcare professionals, children/young people, families/carers and others in hospital and the community and addressing these needs within resource constraints.*
- 4 *Raising awareness of the specific resuscitation requirements of children/young people with a tracheostomy.*
- 5 *Closer liaison/working between health and education and social work (if appropriate).*

## Section 2: Communication

### Key points:

- 1 *The impact of the loss of normal voice following tracheostomy should not be under-estimated and whenever possible children/young people and their families/carers should be prepared for this.*
- 2 *The speech and language therapist has a key role in the care of children/young people with a tracheostomy.<sup>9</sup>*

Statement	Reasons for statement	How to demonstrate statement is being achieved
Healthcare professionals need to be knowledgeable about communication problems associated with children/young people with a tracheostomy.	Children/young people with a tracheostomy may have communication problems that affect their ability to interact and be involved in their own care. Involvement of children/young people/carers is vital in supporting the child/young person.	There is documented evidence of in-service education to develop and update knowledge of healthcare professionals working with children/young people with a tracheostomy, including communication.
The child/young person's key worker involves the speech and language therapist. Ideally assessment starts pre-operatively for elective tracheostomies.	Speech and language therapists have clinical expertise in assessment and management of communication difficulties.	There is documented referral to the speech and language therapist.
The speech and language therapist will assess the communication skills of the child/young person, dependent on the age and ability of the child/young person.	Timely assessment allows for early intervention planning to facilitate the best means of communication and to reduce the risk of possible future difficulties including the acquisition and development of speech, language and communication skills.	There is documented evidence of specific records provided by the speech and language therapist following assessment to allow the child/young person to develop the best way to communicate to meet their needs.
The speech and language therapist implements and evaluates the communication record specific to a child/young person's needs and reviews it at regular intervals or when health needs change. Equipment and training should be available for hospital and home to assist with communication if age and ability appropriate, eg baby intercoms, sign language.	Children/young people with a tracheostomy may have complex communication needs which require a combination of approaches to minimise problems. This may include appropriate alternative or augmentative communication systems. <sup>10</sup>	The speech and language therapist uses ongoing assessment to update communication programmes in the child/young person's record.

Statement	Reasons for statement	How to demonstrate statement is being achieved
<p>The acute speech and language therapist is responsible for referring the child/young person to the community speech and language therapy service.</p>	<p>To ensure continuity of communication support by giving timeous referral to allow local services to plan ahead.</p>	<p>Referral is documented in the child/young person's record.</p>
<p>If clinically indicated<sup>11</sup> (see Appendix 2), speaking valves/tracheostomy valves should be considered for children/young people, and even young babies.<sup>11,12</sup></p> <p>The decision to consider a speaking valve should be a multidisciplinary one, as not all children/young people will tolerate its use.<sup>1,13</sup></p>	<p>Speaking valves/tracheostomy valves can be extremely effective with children/young people to improve voicing and in babies by encouraging vocalisation at the pre-speech development stage.<sup>11</sup></p> <p>The use of a one way-speaking valve allows air to be inhaled via the valve but exhaled up over the larynx allowing for voice to be produced. The presence of air leak around and above the tracheostomy tube is necessary for this to happen.</p> <p>Speaking valves should not be used with a cuffed tracheostomy tube or whilst asleep.</p>	<p>A formal assessment is carried out by a speech and language therapist along with the child/young persons clinical nurse specialist and the results documented in the child/young person's record.</p> <p>There is a documented protocol within the multidisciplinary team on the use of speaking valves/tracheostomy valves. An individualised advice sheet is given to each child/young person, parent/carer and is included in the child/young persons record.</p>

### Key challenges:

- 1 *Development of guidelines and protocols relating to communication of children/young people with a tracheostomy, to encompass the specific needs of children/young people.*
- 2 *Sharing of information with the acute and community multidisciplinary team about the child/young person's communication.*
- 3 *Provision of in-service education with the support of local speech and language therapists to develop knowledge of tracheostomy communication issues.*
- 4 *A multidisciplinary approach with the involvement of families and carers and secondary and tertiary centres is required to manage communication issues for children/young people with a tracheostomy.*
- 5 *Additional resources are required to provide any communication aids that may be needed, to provide support in the community/home and at nursery/school and to provide continuing education to all involved in the care of children/young people with a tracheostomy.*
- 6 *Assessment by appropriately skilled healthcare professionals needs to be ongoing as children/young people's needs change with development.*
- 7 *Ensuring that access to specialist advice and support is available particularly for those children/young people with complex communication needs.*
- 8 *Effective discharge planning is needed to facilitate a smooth transition into the community.*

### Section 3: Swallowing and nutrition

#### Key points:

- 1 *The presence of a tracheostomy tube may impair swallowing with increased risk of aspiration.*
- 2 *An impaired swallow may compromise the child/young person's nutritional status. Healthcare professionals have an important role in the provision of good nutritional care for children/young people with tracheostomies.*
- 3 *Swallowing difficulties may be due to many factors (Appendix 4).*
- 4 *Children/young people with a tracheostomy may experience loss of appetite due to the altered airway, which causes reduction in the ability to smell and taste.*
- 5 *The speech and language therapist should implement an oro-motor programme for the child/young person who is non-orally fed in order to normalise sensation and maintain and promote skills.<sup>10</sup> A child/young person who is non-orally fed can become orally hypersensitive resulting in possible future behavioural feeding difficulties.<sup>14</sup>*

Statement	Reasons for statement	How to demonstrate statement is being achieved
Healthcare professionals and parents/carers, working together to provide a multidisciplinary team approach, are knowledgeable about nutritional and swallowing problems associated with children/young people with a tracheostomy.	Multidisciplinary management offers an efficient and co-ordinated way of dealing with any nutritional or swallowing difficulty.	There is documented evidence of the in-service education, including nutrition issues, provided to develop and update the knowledge of healthcare professionals and parents/carers working with children/young people with a tracheostomy.
Speech and language therapists undertake an initial assessment of swallowing function, including first gathering relevant information from the multidisciplinary team, and recognise when to involve the dietitian. The assessment should be carried out along with the child/young person's nurse.	If difficulty with swallowing is identified, early potential problems can be minimised. Speech and language therapists are knowledgeable in the assessment of the swallow. It is essential to carry out the assessment along with the nurse who is knowledgeable in suctioning and emergency procedures.	Where an impaired swallow is identified, additional appropriate investigations may be undertaken following Royal College of Speech and Language Therapists (RCSLT) clinical guidelines. <sup>10</sup> The referral and outcome of the speech and language therapy assessment is recorded in the child/young person's record.
Dietitians undertake the nutritional assessment of the child/young person with identified impaired swallow.	Children/young people have particular needs that require expert intervention to maintain nutritional status. Children/young people's needs will change as they develop.	The referral and outcome of the nutritional assessment is recorded in the child/young person's record.
Following assessments, healthcare professionals plan, implement and evaluate a nutritional record specific to the child/young person's needs and provide ongoing reviews.	A clear prescription of nutritional requirements specific to each individual child/young person is required to ensure that adequate nutrition is received safely.	The individualised nutritional plan is documented in the child/young person's record. For nasogastric and gastrostomy feeding, best practice guidelines should be followed. <sup>14</sup>

Statement	Reasons for statement	How to demonstrate statement is being achieved
<p>Oral hygiene should be maintained through regular oral care.</p>	<p>Good oral health will assist effective nutrition.<sup>15,16</sup> Oral bacteria and poor oral hygiene seem to influence the incidence of pulmonary infections.<sup>17</sup> Children who receive reduced or no oral feeds require moisture to prevent their mouth becoming dry.<sup>14</sup></p>	<p>Evidence of good oral health is documented in the child/young person's record.</p>
<p>If the child/young person has a cuffed tube, swallowing should be assessed with the cuff deflated and only following medical clearance to do so.<sup>18</sup> Assessment should be done along with multidisciplinary team members able to deflate/inflate tube, suction, modify ventilation settings, etc.<sup>19</sup></p>	<p>Indications for cuffed tubes are limited in paediatrics and may be used to manage severe aspiration of secretions or significant difficulties with ventilation.<sup>20</sup> There may be dysphagia present secondary to the primary medical diagnosis.<sup>21</sup> If the medical condition requires a cuffed tube because of the danger of severe aspiration then oral feeding should not be considered.<sup>22</sup></p>	<p>There is documented evidence of a protocol for the multidisciplinary team to follow in making any decision to assess the swallow if a cuffed tube is present which should be recorded in the child/young person's record. There is a detailed protocol for cuff deflation to follow when assessing the swallow as well as a record of the routine swallow assessment recorded in the child/young person's record.</p>

### Key challenges:

- 1 *Development of guidelines and protocols relating to nutrition of children/young people with a tracheostomy, and multidisciplinary referrals.*
- 2 *Sharing swallowing and nutrition information with the acute and community multidisciplinary team.*
- 3 *Provision of in-service education and written information (with the support of the speech and language therapy and dietetics departments) to develop knowledge of tracheostomy nutrition issues for all healthcare professionals and parents/carers.*
- 4 *Development of readily accessible swallowing assessment services, including access to videofluoroscopy.*
- 5 *Development of guidelines and information to support transition from hospital to community care.*

## Section 4: Stoma care

### Key points:

- 1 *Children/young people with a tracheostomy are at increased risk of infection and granulation tissue formation of the stoma site.*
- 2 *Effective nursing management of the stoma will aid the prevention of peristomal infection and irritation.*
- 3 *A well-formed tracheal tract will be evident about 5 days post operatively; sutures can usually be removed 5–10 days after the procedure.* <sup>2,3,24</sup>

Statement	Reasons for statement	How to demonstrate statement is being achieved
All healthcare professionals involved in tracheostomy management are provided with education on stoma management.	To increase clinical skill and knowledge of stoma management.	Documented programmes relevant to clinical need and to individual requirements are available. Healthcare professionals are able to demonstrate clean stoma care.
All children/young people with a tracheostomy stoma should have frequency of stoma care individually assessed with care undertaken at least daily <sup>25</sup> using clean technique.	Tracheostomy stomas are a potential avenue for respiratory tract infection. Clean technique is advocated as the skin is contaminated with organisms. <sup>26</sup>	Incidence of peristomal infection in children/young people with a tracheostomy is kept to a minimum.
All children/young people should have an evaluation of stomal condition documented in their record and an appropriate plan of care initiated.	To allow ongoing assessment of the stoma. To assist sharing clinical findings.	There is documented evidence of stomal condition in the child/young person's record and local policies/guidelines are available.
The stoma should be cleaned as per local policy. A barrier film should be applied to the surrounding skin if clinically indicated. Cotton wool must not be used to cleanse around the stoma.	A non-irritant solution is used to clean the skin and tracheal mucosa. To protect the skin from tracheal secretions and encouragement of wound healing. Risk of inhalation from fibres.	Evidence that healthcare professionals are aware of when to apply barrier film and methods to encourage wound healing.
Use of dressings around the healthy stoma site is unnecessary, unless clinically indicated, in which case there are specifically designed tracheostomy dressings available.	Tracheostomy tubes have soft flanges (except silver tubes) that do not require a dressing between the tube and the skin. Dressings provide an ideal environment for bacterial colonisation.	Documented evidence that healthcare professionals are knowledgeable in the types of dressings available and able to identify the most appropriate one based on clinical need.
Devices securing the tracheostomy tube should be checked regularly for security.	To reduce the incidence of accidental tube dislodgement.	Evidence of securing device being checked is documented in the child/young person's record.

Statement	Reasons for statement	How to demonstrate statement is being achieved
Parents/carers and children/young people (age appropriate) are taught to manage stoma care prior to discharge.	Parents/carers/children/young people are aware of importance of keeping stoma clean. Confidence in parents/carers and independence in children/young people with a tracheostomy.	Local policies and guidelines are available on how to teach parents/carers/children/young people (age appropriate) to manage stoma care. There is documented evidence that the parent/carer/child/young person has been taught to care for their stoma.
Observe tracheostomy site for signs of over granulation. Treat over granulation appropriately. <ul style="list-style-type: none"> <li>• antibiotic ointment/antifungal/steroidal cream</li> <li>• silver nitrate stick, and</li> <li>• laser.</li> </ul>	Minimise risk of external obstruction of the stoma. Reduce risk of local bleeding and infection. Optimise potential decannulation.	Education of healthcare professionals and parents/carers to recognise granulation. Local guidelines. Document of affected area, treatment and result.
Healthcare professionals and parents/carers understand the potential sources of micro-organisms and the need for good hand hygiene before and after touching the site.	Hand hygiene is considered to be the single most important practice in reducing the transmission of infectious agents. <sup>27</sup>	Local infection control policies and guidelines are available to teach parents/carers/children/young people (age appropriate) the potential sources of infection. Evidence of infection control training packages/materials.

### Key challenges:

- 1 *Development of local policies/guidelines relating to tracheostomy stoma care.*
- 2 *Sharing stoma care information with the acute and community multi-disciplinary team.*
- 3 *Provision of educational resources to develop new skills and teach/supervise less experienced staff/carers.*
- 4 *Development of evidence to support current practice.*

## Section 5: Tracheostomy tube management

### Key points ~ General tube management

- 1 *There is a variety of tracheostomy tubes available. Tracheostomy tubes are made from either polyvinyl chloride (PVC), silicone or silver. All fit into the following categories: neonatal; paediatric and adult sizes; cuffed/uncuffed; fenestrated/unfenestrated; double/single cannula; minitracheostomy; and those with an adjustable flange. Each tube type requires specific management.\**
- 2 *Some styles of adult tracheostomy tubes have inner cannulae (see Appendix 11).*
- 3 *Effective tube management combined with suction and humidification can reduce the incidence of complications in the child/young person with a tracheostomy and is integral to the reduction of clinical risk.*
- 4 *Parents/carers and the child/young person (age/ability appropriate) should be confident and competent in tube management prior to discharge from hospital.*

Statement	Reasons for statement	How to demonstrate statement is being achieved
Individual assessment of the most appropriate tube should be made by the multidisciplinary team.	Consideration needs to be given to: <ul style="list-style-type: none"> <li>• the clinical need/reason for tracheostomy</li> <li>• the amount of secretions</li> <li>• whether radiotherapy is required, and</li> <li>• whether magnetic resonance imaging (MRI) is required (see Appendix 5)</li> </ul>	There are local policies and guidelines on appropriate tube selection available. Training and education on tube selection is provided and recorded.
It is essential practice for the child/young person to have another tube, of the same size and type as well as a tube one size smaller available at all times.	To facilitate a child/young person's airway in the event of an obstructed or accidentally decannulated tube.	There are local policies and guidelines on emergency airway management. Documentation of tubes available recorded in the child/young person's records. Ongoing education on emergency airway management is provided and documented.
If the child/young person is using a single cannula tube it should be changed at least once a week. This should be assessed on an individual basis as children/young people may require more or less frequent changes. <sup>28</sup>	To minimise the risk of airway obstruction and infection.	Local policies/guidelines are available on tracheostomy tube replacement in line with manufacturer's guidelines and a written record of serial numbers and dates replaced. This should be documented in child/young person's record. Ongoing education on tracheostomy tube replacement is provided to healthcare professionals and documented.

\* Tracheostomy tubes are commonly referred to by the name of the manufacturer; eg Shiley, Portex or Kapitex. Illustrations of available tubes are provided in Appendix 11.

Statement	Reasons for statement	How to demonstrate statement is being achieved
Routine tracheostomy tube changes should not occur immediately before or after eating.	The tracheostomy tube change procedure may cause coughing/gag reflex/vomiting.	Documented evidence of education of healthcare professionals and parents/carers in safe routine tracheostomy tube management.
The <b>first tube change</b> is a <b>high risk procedure</b> and should be undertaken under medical direction. This takes place 5–7 days after the surgical procedure. <sup>23</sup>	The time delay allows a tract to become established within the trachea, therefore, minimising the risk of stomal closure on tube removal.	There are local guidelines and policies on management of the tube including information on the frequency of tube changing.
A note should be made of the technique used to form the tracheostomy, size and style of tube and, in particular, whether the trachea is stitched up to the skin.	Stitches and type of suturing will affect care.	Documented evidence of stitching and type of suturing in the child/young person's record.
All children/young people with a tracheostomy have tubes cleaned or replaced as appropriate following manufacturer's guidelines and in line with infection control policies.	Tubes in situ are a potential reservoir for pathogenic bacteria.	Local policies/guidelines are available on how tracheostomy tubes are cleaned. These are in line with manufacturer's guidelines, local infection control and decontamination policies.  Local policies/guidelines are available on tracheostomy tube replacement in line with manufacturer's guidelines and a written record of serial numbers and dates replaced.
Brushes are not used on plastic tubes unless specifically recommended by the manufacturer.	Brushes may cause damage to the lining of the tube.	Documented the child/young person's record.

Statement	Reasons for statement	How to demonstrate statement is being achieved
<p>In addition to standard resuscitation equipment, all children/young people with a tracheostomy require the following equipment (which is checked at least daily) to be readily accessible for emergency procedures:</p> <ul style="list-style-type: none"> <li>• a tracheostomy tube the same size as the child/young person has in situ</li> <li>• a tracheostomy tube a size smaller than that in situ</li> <li>• <b>if a cuffed tube in situ</b> - a cuffed tracheostomy tube and an uncuffed tracheostomy tube the same size as in situ plus a 10ml syringe</li> <li>• securing devises</li> <li>• stitch cutters (prior to first tube change)</li> <li>• scissors</li> <li>• manual resuscitation bag</li> <li>• appropriately sized face mask (to fit manual resuscitation bag) if clinically indicated</li> <li>• air-tight waterproof tape (to occlude tracheostomy stoma if unable to insert tube and need to perform basic life support via face mask)</li> <li>• suction machine</li> <li>• appropriately sized suction catheters</li> <li>• gloves</li> <li>• tracheal dilators prior to first tube change in an ITU setting, and</li> <li>• alcohol based hand rub.</li> </ul>	<p>To ensure appropriate equipment is available in an emergency.</p> <p>Use of a larger syringe as part of the resuscitation equipment may pose a risk of over inflation of a cuffed tracheostomy tube and subsequent damage to the trachea.</p>	<p>Children/young people with a tracheostomy have their own emergency equipment with them at all times.</p> <p>Local policy/guidelines are available on equipment which is to be readily accessible in an emergency.</p> <p>Accessibility of equipment required in an emergency is documented in the child/young person's record.</p>
<p>All children/young people for whom decannulation is considered should be individually assessed by the multidisciplinary team.</p>	<p>To facilitate safe and effective decannulation.</p>	<p>There are local policies and guidelines on the decannulation procedure.</p>
<p>Close monitoring and observation of the child/young person's airway and respiratory status occurs throughout the decannulation process.</p>	<p>To allow early detection of any difficulties throughout the process.</p>	<p>There are local policies and guidelines on the decannulation procedure available.</p> <p>The decannulation procedure is documented in the child/young person's record.</p>
<p>All children/young people must have their emergency equipment with them at all times during the decannulation process.</p>	<p>To ensure that emergency equipment is available to manage any airway and respiratory difficulties.</p>	<p>There are local policies and guidelines on the decannulation procedure available.</p> <p>The decannulation procedure is documented in the child/young person's record.</p>

## Key points ~ Cuffed tracheostomy tubes

- 1 *Cuffed tubes are useful for reducing aspiration and minimising air leakage during ventilation.*
- 2 *Cuffed tubes come in a variety of styles – air cuff, water cuff, foam cuff. Each cuff type requires specific management.*
- 3 *Appropriate management of a cuffed tube can prevent damage to the tracheal mucosa.*
- 4 *Tracheostomy tubes have a low-pressure cuff that removes the need to deflate the cuff on a regular basis.*
- 5 *In some styles of cuffed tubes a manometer should be used to measure cuff pressure, by staff competent in manometer use.*

Statement	Reasons for statement	How to demonstrate statement is being achieved
Most tracheostomy tubes with a cuff have high volume, low pressure cuffs. The cuff should be inflated to the minimal desired occlusion volume.	The pressure of the cuff is dissipated over a wider surface area. To prevent trauma to the mucosal wall. <sup>29</sup>	Local protocols or guidelines on recording of cuff pressure are available. Competency of staff to undertake the technique of minimal occlusion volume (MOV) (see Appendix 9).
Cuffed tracheostomy tubes that have air cuffs should have cuff pressure checked at least once daily maintaining pressure between 15–25cmH <sub>2</sub> O using a manometer. <sup>30</sup>	Cuff pressure above 30cmH <sub>2</sub> O may cause damage to the tracheal mucosa. If the pressure is below 15cmH <sub>2</sub> O, aspiration may occur.	Local protocols or guidelines on recording of cuff pressure are available. Competency of healthcare professionals to undertake the role is assessed. Pressure is documented within the child/young person's record.

**Key points ~ Inner cannula management**

- 1 *Inner cannulae reduce the lumen of the outer tracheostomy tube increasing respiratory effort.*
- 2 *Inner cannulae are designed to allow easy removal for cleaning without having to remove the outer tube.*
- 3 *Provision of training to recognise a displaced tube.*

Statement	Reasons for statement	How to demonstrate statement is being achieved
<p>All children/young people with a tracheostomy tube with an inner cannula require individual assessment of the frequency of inner cannula care.</p>	<p>To minimise the risk of obstruction.</p>	<p>Documentation identifies the:</p> <ul style="list-style-type: none"> <li>• type of tube in situ</li> <li>• amount of secretions the child/young person produces, and</li> <li>• frequency of cleaning.</li> </ul> <p>Local policies/guidelines are available on how tracheostomy inner cannulas are cleaned. These are in line with manufacturer's guidelines, local infection control and decontamination policies.</p>

## Key points ~ Fenestrated tubes

- 1 Fenestrated tubes are rarely used in children and young people.
- 2 Fenestrated tubes may be cuffed or uncuffed.
- 3 Fenestrated tubes are used to encourage weaning from the tracheostomy and also for voicing.
- 4 Fenestrated tubes are supplied with two inner cannulae; one is fenestrated and one is not.

Statement	Reasons for statement	How to demonstrate statement is being achieved
All children/young people with a fenestrated tracheostomy tube have the fenestrated inner cannula removed prior to tracheal suction and replaced with an unfenestrated inner cannula.	It is possible to insert the suction catheter through the fenestration causing damage to the tracheal wall.	Documented evidence that healthcare professionals have received training in the use of fenestrated tracheostomy tubes. Local policies/procedures on the management of fenestrated tubes are available. Management of fenestrated tubes is documented in the child/young person's record.
All children/young people with a fenestrated tube require an unfenestrated tube to be readily accessible for use in an emergency.	To allow ventilation with emergency equipment as air will exit via the fenestration.	Information is recorded in the child/young person's record.

## Key challenges:

- 1 Development of local policies/guidelines relating to all aspects of tracheostomy tube care.
- 2 Sharing tracheostomy tube management information with the acute and community multidisciplinary team.
- 3 Provision of educational resources to develop new skills and teach/supervise less experienced healthcare professionals.
- 4 Development of evidence to support current practice.
- 5 Assessing the competence of healthcare professionals to undertake all aspects of tracheostomy tube management.
- 6 Ensuring parents/carers and children/young people (if age appropriate) are educated in all aspects of tube management and are confident and competent in managing the tube prior to the child/young person's discharge from hospital.

## Section 6: Suctioning

### Key points:

- 1 *The frequency of tracheal suctioning should be assessed for each child/young person on an individual basis and should only be carried out when the child/young person is unable to clear their own airway effectively.*
- 2 *Suctioning should maximise removal of secretions with minimal tissue damage and hypoxia.*
- 3 *Standard infection control precautions should be applied, including good hand hygiene and use of personal protective equipment.*
- 4 *Suction equipment should be easily accessible and must be checked daily.*
- 5 *Children/young people who have difficulty clearing secretions may require referral to a respiratory physiotherapist.*
- 6 *Individual assessment of the child/young person will determine what equipment is required at home.*

Statement	Reasons for statement	How to demonstrate statement is being achieved
<p>Where possible, the lowest effective pressure should be used when suctioning, using equipment with an adjustable and measurable dial. The recommended pressures are:</p> <ul style="list-style-type: none"> <li>• 60–80mmHg (8–10kPa) for neonates,<sup>31,32</sup></li> <li>• 80–100mmHg (10–13kPa) for children,<sup>33</sup> and</li> <li>• 80–120mmHg (10–16kPa) for adolescents<sup>34</sup></li> </ul>	<p>There is a requirement to set suction levels which are safe and effective.<sup>35</sup></p> <p>Pressures in excess of 26.7kPa (200mmHg) can result in greater mucosal trauma.<sup>36,37</sup></p> <p>There is a risk of atelectasis if suction pressure is too high.<sup>38,39</sup></p> <p>Low pressures are less effective and prolong suction time.<sup>40</sup></p>	<p>There is evidence that suctioning training specific to children and young people with a tracheostomy is provided to families/carers and healthcare professionals.</p>
<p>Suctioning should last no longer than 5 seconds at a time.<sup>5</sup></p> <p>Appropriately sized, single-use multi-eyed or closed system, multi-use catheters should be used.</p> <p>Suction catheter diameter must not exceed half the internal diameter of the child/young person's tracheostomy tube size.<sup>38,41</sup></p>	<p>Prolonged suctioning results in hypoxia.</p> <p>Tracheal suctioning can cause tracheal mucosal damage. Multi-eyed catheters cause least trauma.<sup>39</sup></p> <p>To enable gas flow between suction catheter and airway wall thus preventing atelectasis.<sup>42</sup></p>	<p>Local policies provide guidance on appropriate suctioning technique.</p> <p>Documented record of catheter use within the child/young person's record.</p> <p>Appropriate suction catheter size should be documented in the child/young person's record.</p>
<p>Suctioning should be carried out using the 'pre-measured technique'.<sup>44,33</sup> The suction catheter should not be inserted more than half a centimetre beyond the end of the tracheostomy tube.<sup>28</sup> (See Appendix 10).</p>	<p>Animal model studies<sup>45</sup> and post mortem studies<sup>46</sup> clearly demonstrate epithelial damage where deep suction is routinely performed.<sup>47</sup></p>	<p>Documented record within the child/young person's record that pre-measured technique is used.</p>
<p>The need for hyperoxygenation prior to procedure should be assessed on an individual basis in line with hospital/community policy</p>	<p>To minimise risk of hypoxia associated with suctioning for identified children/young people.</p>	<p>Documented within the child/young person's record. Hospital/community policy in place.</p>

Statement	Reasons for statement	How to demonstrate statement is being achieved
If a fenestrated tube is in situ, a plain inner tube should be inserted prior to suctioning.	It is possible to insert the suction catheter through the fenestration causing damage to the tracheal wall.	Documented within the child/young person's record.
Healthcare professionals are aware of the psychological effect of suctioning on children/young people.	Suction can be a traumatic experience for the child/young person and their parents/carers.	Information is available in a variety of accessible formats to promote child/young person/parent/carer understanding and reduce anxiety.
Local infection control policy must be adhered to throughout the tracheal suctioning process including the use of personal protective equipment (PPE) and performing hand hygiene. There must be use of intact sterile equipment and safe disposal of waste.  Isotonic sodium chloride solution should not be instilled routinely. <sup>48</sup>	There is a risk of contamination of equipment, cross infection to the child/young person and exposure of healthcare professionals to tracheal secretions.  Instillation of sodium chloride can have an adverse effect on oxygen saturations. <sup>49</sup>	A local infection control policy addresses issues and precautions required in relation to tracheal suctioning and disposal of equipment.  Documented within the child/young person's record.

### Key challenges:

- 1 *Development of local policies/guidelines for children/young people relating to suctioning of a tracheostomy.*
- 2 *Sharing suctioning information with the acute and community multi-disciplinary team.*
- 3 *Ensuring appropriate equipment is readily available, including correct catheter size and type.*
- 4 *Providing regular in-service training/communication for healthcare professionals working with children/young people with a tracheostomy.*
- 5 *Providing support and teaching of suctioning technique for children/young people and families/carers and ensuring that the family/carers understand the procedure.*

## Section 7: Humidification

### Key points:

- 1 *The normal humidification and filtration system is bypassed in children/young people with a tracheostomy. Breathing unhumidified air can thicken secretions and increase the risk of mucous plugging. Humidification must be artificially supplemented to minimise this risk of thickened secretions and mucous plugging.<sup>50</sup>*
- 2 *The need for humidification in children/young people with a tracheostomy is ongoing. A range of products are available for providing humidification in the child/young person's home environment. The choice of artificial humidification system is dependent on the child/young person's age and condition (see Appendix 11). An ideal device for every child/young person is not available<sup>28</sup> and it may be necessary to use a combination of humidification systems.*
- 3 *Maintenance of safety is a key consideration in children/young people with a tracheostomy when using any humidification product.*

Statement	Reasons for statement	How to demonstrate statement is being achieved
Healthcare professionals undertake assessment of humidification needs in children/young people with a tracheostomy.	The normal humidification and filtration system is bypassed in children/young people with a tracheostomy.	There is documented evidence of humidification assessment in the child/young person's records.
Children/young people with a tracheostomy require humidification to maintain mucociliary clearance and to reduce the risk of pulmonary infection. <sup>51</sup> Heat and moisture exchanger (HME) filters heat air to the child/young persons body temperature. <sup>28</sup>	It is desirable to heat and humidify inspired gas to match the normal physiological conditions at the level of the catina. <sup>9</sup> Humidification is necessary to prevent: <ul style="list-style-type: none"> <li>• obstruction/occlusion of tracheostomy tube</li> <li>• atelectasis</li> <li>• pulmonary infection</li> <li>• poor ventilation/perfusion coupling, and</li> <li>• tracheitis.<sup>51,52</sup></li> </ul>	There is a system to monitor inspired gas temperatures.
Healthcare professionals are aware of the benefits associated with the various humidification devices available for children/young people with a tracheostomy.	HME filters are efficient when used with children/young people with 'normal' amounts of thin secretions. HME filters are simple to use and are cost effective. <sup>28</sup> HME filters should be changed every 24 hours, or more often as indicated. <sup>6</sup> Heated systems are very efficient and temperature can be controlled at recommended humidity levels. Delivery of inspired air at 37°C and 100% relative humidity maintains the body's normal defence mechanisms. <sup>51,53</sup> Nebulisers are safe and efficient. <sup>28</sup>	Documented evidence of training and education programmes to inform healthcare professionals of the types of humidification systems available and the safe use of systems which are employed locally.

Statement	Reasons for statement	How to demonstrate statement is being achieved
<p>Healthcare professionals are aware of particular problems associated with artificial humidification in children/young people with a tracheostomy.</p>	<p>Excessive artificial humidification of inspired gases may produce as much harm as under humidification.<sup>5</sup>  HME filters (artificial noses) increase the dead space, resistance and the weight on the tracheostomy tube. The HME filter may become blocked.<sup>6</sup>  Heated systems are prone to rain out (condensation in the tubing) when water vapour cools and collects in the tubing.<sup>28</sup>  Distilled water and saline reservoirs in humidification systems have been shown to be a source of infection.<sup>54</sup>  Nebulisers may be too cool<sup>28</sup> and they require a gas flow generator and tubing making them inconvenient for active children/young people.<sup>6,20</sup></p>	<p>Appropriate sized HME documented in the child/young person's record.</p>
<p>Humidification systems are managed in accordance with the manufacturer's instructions, local guidelines or protocols and infection control policy.</p>	<p>Humidification systems vary and healthcare professionals must be aware of differences in equipment.</p>	<p>Local guidelines and protocols are in place.</p>

Statement	Reasons for statement	How to demonstrate statement is being achieved
The child/young person and parents/carers should be fully aware of the need for and appropriate use of humidification equipment.	Provision of appropriate information may improve parent/carer/child/young person compliance and, therefore, minimise long-term problems.	Documented discussion with the parents/carers. Information provided to parents/carers in the local parental information and treatment pack on tracheostomy care and management.

**Key challenges:**

- 1 *Development of local policies/guidelines relating to humidification of a tracheostomy for children/young people.*
- 2 *Sharing humidification information with the acute and community multidisciplinary team.*
- 3 *Provision of training and education to develop the knowledge of parents/carers whose child/young person requires artificial humidification.*
- 4 *Provision of training and education to develop knowledge of healthcare professionals caring for children/young people who require artificial humidification.*
- 5 *Development and implementation of evidence-based protocols and procedures for all healthcare professionals and parents/carers.*
- 6 *Local provision and access to a range of humidification systems and equipment.*

## Section 8: Therapeutic play interventions

### Key points:

- 1 *Play is an essential part of a child/young person's normal healthy development which enables children/young people to learn, communicate and develop.*
- 2 *Play programmes assist in the achievements of developmental goals for children/young people. When development is impaired or delayed, a referral should be made to a physiotherapist skilled in neuro-developmental therapy.*
- 3 *Play services in hospital help families/carers adjust to potentially stressful situations and events and understand illness and treatments.*

Statement	Reasons for statement	How to demonstrate statement is being achieved
All children/young people staying in hospital should have access to a qualified play specialist. <sup>55</sup>	Play is essential to the overall healthy development of children/young people. Medical conditions must not limit the child/young person's social and emotional development.	Audit of play services. <sup>56, 57</sup>
Healthcare professionals have knowledge of childhood development and should recognise the importance of safe play techniques for a child/young person with a tracheostomy and refer to the play specialist.	In order to support the parents/carers' a good understanding of child development is essential. Play/toys of other children/young people can be a risk for children/young people with tracheostomy, eg sand play.	There is documented evidence of local training and education organised by the play specialist. There is documented referral to the play specialist. Risk assessments are carried out and documented.
Play specialists should meet the developmental, medical and emotional needs of individual children/young people and families/carers as part of the multidisciplinary team liaising with all disciplines to meet the overall needs of the child/young person. Structured play and developmental play programmes are planned, developed and evaluated by a qualified play specialist.	Play can be an important factor in reducing any harmful effect of stress and hospitalisation. It is through play that children/young people can be empowered to communicate and have an outlet for behaviours. Play specialists have specific training in providing play for children/young people and families/carers in the hospital and community setting.	This is documented in child/young person's record/developmental assessment. Local guidelines for professional practice based on the National Association of Hospital Play Staff Guidelines for Professional Practice. <sup>58</sup> Personal development plan (PDP) for play specialist and team.
Education/information packs should incorporate advice on appropriate and safe play for children/young people with tracheostomy. These packs will be distributed to the child/young person's nursery/school. Play specialists will liaise with community teams.	Not all materials/activities are suitable for children/young people with a tracheostomy. <sup>59</sup>	Documented evidence of local guidance. Record of information given to parents/carers/school/nursery on the discharge checklist. Local parent/carers information and teaching pack on tracheostomy care and management is given to parents/carers nurseries and schools.

Statement	Reasons for statement	How to demonstrate statement is being achieved
<p>All children/young people should be offered psychological preparation/post procedural play programmes.</p>	<p>Research demonstrates that psychological preparation has been found to be effective in reducing distress and enhancing coping.<sup>57,60</sup>                      Post procedural play sessions can help families understand the treatment/condition.<sup>61</sup></p>	<p>Documented evidence in the child/young person's record that psychological preparation has been offered.                      Documented evidence of local guidance.                      Risk assessments are carried out and documented.</p>
<p>All children/young people should be offered distraction therapy for any treatment or procedure undertaken, eg tube changes, suction.                      Parents/carers should be taught distraction techniques.</p>	<p>Distraction is an effective coping strategy.<sup>62</sup>                      The play specialist is a facilitator who works in partnership with parents and other staff.<sup>63</sup></p>	<p>Documentation of use of distraction therapies, observation and families feedback.</p>

**Key challenges:**

- 1 *Development of local policies/guidelines relating to therapeutic play interventions for children/young people with a tracheostomy.*
- 2 *Sharing therapeutic play intervention information with the acute and community multidisciplinary team.*
- 3 *Development of a national parent/carers information and treatment pack on tracheostomy care and management for children/young people.*

## Appendix 1: Total number of tracheostomies in children/young people in Scotland

Total Number of tracheostomies (excluding laryngectomies) in children/young people.				
Years ending 31 December 1997–2006				
Year of main operation	Age group	Total number of tracheostomies	Rate per 100,000 population	Population
1997	0–12	13	1.58	822,181
	13–17	10	3.14	318,166
1998	0–12	21	2.58	813,307
	13–17	6	1.89	317,491
1999	0–12	24	2.99	802,755
	13–17	7	2.21	316,627
2000	0–12	21	2.66	789,128
	13–17	19	5.96	318,872
2001	0–12	18	2.32	774,409
	13–17	5	1.55	323,196
2002	0–12	35	4.60	761,434
	13–17	4	1.23	324,364
2003	0–12	16	2.13	750,795
	13–17	9	2.79	322,877
2004	0–12	23	3.10	742,572
	13–17	6	1.85	324,074
2005	0–12	24	3.27	734,015
	13–17	8	2.46	325,012
2006	0–12	18	2.47	727,633
	13–17	5	1.55	322,557

Source: Information Services Division (ISD), SMR01 data  
 Based on all operations during the patients' stay.  
 ICD10 codes - E42 (excluding E425, E426 and E427).  
 Population figures taken from the Scottish GRO mid-year population estimates.

## **Appendix 2: Contraindications for speaking valve use<sup>11</sup>**

- Severe stenosis
- Severe tracheomalacia
- Excessive granulation tissue
- Tracheal oedema
- Bilateral vocal cord palsy (adducted)
- Medical instability
- Severely reduced lung capacity
- Copious thick secretions
- Cuffed tracheal tube
- Laryngeal papillomatosis (aggressive)

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### Appendix 3: Factors which may affect communication

- The position of the tracheostomy tube changes the diversion of the airflow with the majority of the outgoing breath passing out through the tracheostomy tube as opposed to the normal flow up and over the vocal cords and out of the mouth, resulting in the decreased ability to vocalise.
- The time from birth to five years is a critical period for acquiring speech, language and communication skills and the impact of not being able to vocalise can affect the development of these skills.<sup>5</sup>
- Children/young people who had a tracheostomy as babies and decannulated between the age of one and four can have significant delay of expressive language use. In addition the longer the period of the tracheostomy, the more likely there will be impairment of speech sound production.<sup>64</sup>
- Babies use both vocalisation, crying and non-verbal communication such as facial expression and eye contact to communicate. Decreased ability to vocalise can have an impact on the child/young person/parent/carer interactions at this early stage as well as possible future impact on communication development and social interaction.<sup>5</sup>
- There may be other medical, neurological, sensory disorders or structural abnormalities involved which can have a direct affect on the ability to communicate.<sup>10</sup>
- Good air leak around the tracheostomy tube and evidence of being able to make voice can allow for the use of a speech valve by creating an oral air stream and allow voicing on the outgoing breath. Using a speech valve can create a louder voice as well as impacting on speech and language development in the younger child.<sup>65</sup>
- Some children/young people will have had normal speech and language use prior to the tracheostomy and their communication needs will be different. Frustration at not being able to communicate needs, feelings and opinions is an added factor. Speech and language therapy input as early as possible will allow for decisions to be made for developing an appropriate communication system for the child/young person to allow them a means of expression even if it is only required for a short time.<sup>64</sup> This may involve alternative communication systems using low or high tech aids.<sup>66</sup>

## Appendix 4: Factors which may affect swallowing

Adult literature on swallowing with a tracheostomy has suggested associated difficulties relating to the pharyngeal stage of the swallow.<sup>21</sup> Also well documented, is that aspiration is the major swallowing difficulty associated with tracheostomy in the adult population.<sup>19</sup> There is however little data available for the paediatric population<sup>21</sup> but a number of factors are suggested which may impact on swallowing.

- Swallowing difficulties may be present secondary to the primary medical diagnosis.<sup>21</sup>
- Children/young people with isolated airway problems are not likely to have any swallowing problems.<sup>67</sup>
- Children/young people with long-term tracheostomies may have pharyngeal stage difficulties.<sup>62</sup>
- Restriction of upward laryngeal movement can limit laryngeal closure necessary for complete epiglottic closure.<sup>68</sup>
- Air diversion through the tracheostomy tube may lead to laryngeal desensitisation due to lack of airflow in the upper respiratory airway. This may also have an effect on co-ordinated laryngeal closure.<sup>69</sup>
- In ventilated children, the co-ordination of sucking, swallowing and breathing is altered and may lead to swallow dysfunction.<sup>69</sup>
- Cuffed tube use is limited in paediatrics but if required oral feeding should not be considered.<sup>21</sup>
- Presence of infantile gastro oesophageal reflux commonly affects behaviour, swallowing and food intake.<sup>70</sup>

## Appendix 5: Tracheostomy tube table

Manufacturer and description	Sizes	Comments
<p><b>SHILEY</b> Opaque, thermosensitive polyvinyl chloride (PVC) (latex-free)</p>	<p>Neonatal Cuffless Tracheostomy Tube: sizes 3.0–4.5mm            Paediatric Cuffless Tracheostomy Tube: sizes 3.0–5.5mm            Paediatric Cuffless Long Tracheostomy Tube: sizes 5.0–6.5mm            Paediatric Cuffed Tracheostomy Tube: sizes 4.0–5.5mm            Paediatric Cuffed Long Tracheostomy Tube: sizes 5.0–6.5mm</p>	<p>Shiley tubes can be left in situ for up to 28 days. They can be reused several times, subject to the integrity of the tube. Follow manufacturer's advice regarding cleaning tubes.</p>
<p><b>TRACOE Mini</b> Radiopaque polyvinyl chloride (PVC)</p>	<p>Neonatal (350 series) Cuffless Tracheostomy Tube: sizes 2.5–4.0mm            Paediatric (355 series) Cuffless Tracheostomy Tube: sizes 2.5–6.0mm</p>	<p>Tubes not reusable, but may remain in situ for up to 28 days. However, at least weekly changes are recommended, as the tube may become coated and blocked with secretions.</p>
<p><b>SIMS PORTEX Bivona</b> Opaque, siliconised polyvinyl chloride (PVC) (latex-free)</p>	<p>Neonatal Cuffless Tracheostomy Tube: sizes 2.5–4.0mm            Paediatric Cuffless Tracheostomy Tube: sizes 2.5–5.5mm            Neonatal Aire – cuff Tracheostomy Tube: sizes 2.5–4.5mm            Paediatric Aire – cuff Tracheostomy Tube: sizes 2.5–5.5mm            Neonatal Tight to the Shaft (TTS)            Cuffed Tracheostomy Tube: sizes 2.5–4.5mm            Paediatric Tight to the Shaft (TTS)            Cuffed Tracheostomy Tube: sizes 2.5–5.5mm            Neonatal Fome-cuf Tracheostomy Tube: sizes 2.5–4.5mm            Paediatric Fome-cuf Tracheostomy Tube: sizes 2.5–5.5mm</p>	<p>Bivona tubes can be left in situ for up to 28 days. Unlike most other plastic products, they can be reused several times, subject to the integrity of the tube. Follow manufacturer's advice regarding cleaning tubes.</p> <p>The silicone tube is reinforced with wire – the wire is not compatible with use during MRI</p> <p>Aire – cuff has an air-filled cuff            TTS Cuff has a water-filled cuff            Fome-cuf has a rubber foam-filled cuff. The foam is self-expanding.</p>
<p><b>Great Ormond Street</b> Polyvinyl chloride (PVC)</p>	<p>Available in sizes 3.0–7.0mm</p>	<p>Tubes not reusable. Not compatible with standard ventilator tubing and/or HMEs and/or resuscitation equipment. <b>Must have access to a portex male/female adaptor of appropriate size for emergency situations.</b></p>
<p><b>SILVER tracheostomy tubes</b> Silver</p>	<p>Available in a range of sizes – measured in the French gauge and not compatible to the metric measurements of plastic tubes.</p>	<p>Thin walled tube, allowing for inner cannula. Silver tubes can be left in situ for 28 days. Follow manufacturer's advice regarding cleaning tubes.  <b>Not compatible with use during MRI.</b></p>

All sizes stated are for the internal diameter.

For information on adult tubes, please see the caring for the patient with a tracheostomy best practice statement.<sup>2</sup>

Appendix 6: Sizing chart for paediatric airways<sup>71</sup>

		Preterm-1 month	1-6 months	6-18 months	18 mths - 3 yrs	3-6 years	6-9 years	9-12 years	12-14 years	
Trachea (Transverse Diameter mm)		5	5-6	6-7	7-8	8-9	9-10	10-13	13	
PLASTIC	Great Ormond Street	ID (mm)	3.0	3.5	4.0	4.5	5.0	5.5	6.0	7.0
		OD (mm)	4.5	5.0	6.0	6.7	7.5	8.0	8.7	10.7
	Shiley	Size	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5
		ID (mm)	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5
		OD (mm)	4.5	5.2	5.9	6.5	7.1	7.7	8.3	9.0
	*Cuffed Tube Available	Length (mm) Neonatal	30	32	34	36				
		Paediatric	39	40	41*	42*	44*	46*		
		Long Paediatric					50*	52*	54*	56*
	Portex (Blue Line)	ID (mm)	3.0	3.5	4.0	4.5	5.0	5.0	6.0	7.0
		OD (mm)	4.2	4.9	5.5	6.2	6.9	6.9	8.3	9.7
	Portex (555)	Size	2.5	3.0	3.5	4.0	4.5	5.0	5.5	
		ID (mm)	2.5	3.0	3.5	4.0	4.5	5.0	5.5	
		OD (mm)	4.5	5.2	5.8	6.5	7.1	7.7	8.3	
		Length Neonatal	30	32	34	36				
		Paediatric	30	36	40	44	48	50	52	
	Bivona	Size	2.5	3.0	3.5	4.0	4.5	5.0	5.5	
		ID (mm)	2.5	3.0	3.5	4.0	4.5	5.0	5.5	
		OD (mm)	4.0	4.7	5.3	6.0	6.7	7.3	8.0	
		Length Neonatal	30	32	34	36				
		Paediatric	38	39	40	41	42	44	46	
	All sizes available with Fome Cuff, Aire Cuff & TTS Cuff									
	Bivona Hyperflex	ID (mm)	2.5	3.0	3.5	4.0	4.5	5.0	5.5	
		Usable Length (mm)	55	60	65	70	75	80	85	
	Bivona Flexextend	ID (mm)	2.5	3.0	3.5	4.0	4.5	5.0	5.5	
		Shaft Length (mm)	38	39	40	41	42	44	46	
Flexextend Length (mm)		10	10	15	15	17.5	20	20		
TracoeMini	ID (mm)	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	
	OD (mm)	3.6	4.3	5.0	5.6	6.3	7.0	7.6	8.4	
	Length (mm) Neonatal (350)	30	32	34	36					
	Paediatric (355)	32	36	40	44	48	50	55	62	
SILVER	Alder Hey	FG	12-14	16	18	20	22	24		
	Negus	FG		16	18	20	22	24	26	28
Chevalier Jackson	FG	14	16	18	20	22	24	26	28	
	Sheffield	FG	12-14	16	18	20	22	24	26	
	ID (mm)	2.9-3.6	4.2	4.9	6.0	6.3	7.0	7.6		
Cricoid (AP Diameter)	ID (mm)	3.6-4.8	4.8-5.8	5.8-6.5	6.5-7.4	7.4-8.2	8.2-9.0	9.0-10.7	10.7	
Bronchoscope (Storz)	Size	2.5	3.0	3.5	4.0	4.5	5.0	6.0	6.0	
	ID (mm)	3.5	4.3	5.0	6.0	6.6	7.1	7.5	7.5	
	OD (mm)	4.2	5.0	5.7	6.7	7.3	7.8	8.2	8.2	
Endotracheal Tube (Portex)	ID (mm)	2.5	3.0	3.5	4.0	4.5	5.0	6.0	7.0	8.0
	OD (mm)	3.4	4.2	4.8	5.4	6.2	6.8	8.2	9.6	10.8

Updated Great Ormond Street Hospital sizing chart for paediatric airways

Tweedie DJ, Skilbeck CJ, Cochrane LA, Cooke J, Wyatt ME. Choosing a paediatric tracheostomy tube: an update on current practice. J Laryngol Otol. 2008;122(2):161-9, page 9 © JLO (1984) Limited, reproduced with permission.

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## Appendix 7: Decannulation

Decannulation involves removal of the tracheostomy tube allowing 'normal' respiration to occur. The following steps should be taken.

### Pre admission

Physical and psychological assessment is essential and will involve the following assessments:

- Swallowing and cough: this can be carried out by medical staff and or a speech and language therapist, it may be necessary to perform a videofluoroscopy.
- Secretions: consider how often is suction required? Are oral secretions still evident? Do they increase during activity?
- Airway assessment: this could include an microlaryngobronchoscopy (MLB) and can be carried out as a pre admission or on day one. This will enable a view of the airway and if the tracheostomy has been inserted due to a primary airway cause, this will be assessed. If the tracheostomy has been inserted to facilitate treatment, it is still advisable to review through an MLB, as the tracheostomy tube can cause airway complication.
- Psychological: it is not always necessary to have a professional psychologist available. However, discussing and listening with the parents, and the child if appropriate, is essential.

### Admission

Day one following airway assessment by ear, nose and throat (ENT) consultant, undertake an MLB if necessary.

Downsize to size 3.mm tracheostomy tube.

Day two cover with decannulation cap if available, or occlude with airtight tape for 12 hours, then uncover overnight.

Day three cover for 24 hours from 8am.

Day four decannulate. Occlude stoma with airtight dressing and continue observations.

Day five child/young person is able to go off the ward.

Day six discharge, with outpatient department appointment in 6 weeks.

Throughout the process, the child/young person should be observed for clinical signs of respiratory distress/fatigue. The child/young person may experience a feeling of panic at each stage initially. It is vital to alleviate this panic, while being vigilant for any signs of respiratory distress. The parents/carers may experience anxiety as their child/young person will be breathing through a smaller tube, before it is occluded and removed. This may feel like they are losing a safe airway. Reassurance of both the child/young person and parents/carers is essential to maximise the safety of this procedure.

If this is unsuccessful, the child/young person's original tube is reinserted. The child/young person's condition will be reassessed, with the possibility of returning to the decannulation process at a later date.

Following a successful decannulation, it may take a number of weeks for the stoma to close. Sometimes a surgical closure is necessary after 6 months.

It is necessary to inform the disability living allowance (DLA) office of the successful decannulation.

### **Observations**

The child/young person will be continually observed for:

- breathing pattern
- respiratory distress
- restlessness
- agitation
- colour
- oxygen saturations, and
- vital signs.

If there any concerns, medical staff must be informed immediately.

## Appendix 8: Discharge checklist

Name \_\_\_\_\_ DOB \_\_\_\_\_ Date \_\_\_\_\_

Action	Achieved/signature	Date
Ear, nose, throat (ENT)/respiratory consultant to make clinical decision that the child/young person requires long-term tracheostomy airway		
Specialist nurse to discuss and answer questions with child/young person (age/ability appropriate) and parents/carers regarding the management of tracheostomy, and training schedule post tracheostomy surgery. Written information given		
Referral to speech and language therapy service		
Referral to play specialist		
Specialist nurse/named nurse to liaise with discharge planning service		
Referral to the relevant community children's nursing (CCN) service if available		
Inform relevant children's nursing service regarding equipment required for discharge		
Equipment delivered direct to the ward for parental/carer training		
All supplies and sundries required for tracheostomy management to be documented and listed with order codes to be faxed to relevant community children's nursing service		
<p>Parents/carers and child/young person (where appropriate) to be given training - practical demonstration and supervised practice regarding tracheostomy management and troubleshooting – see individual child/young person's tracheostomy information.</p> <ul style="list-style-type: none"> <li>• Why the individual child/young person has a tracheostomy airway?</li> <li>• What size/type of tracheostomy tube is in situ?</li> <li>• Tracheal suction technique</li> <li>• What is pre-measured tracheal suction depth?</li> <li>• Set-up of portable suction equipment</li> <li>• Portable suction negative pressure setting?</li> <li>• Tracheal stoma care</li> <li>• Tracheostomy tube change technique</li> <li>• Troubleshooting               <ul style="list-style-type: none"> <li>- Recognition and management of airway obstruction/respiratory distress</li> <li>- Emergency airway management and use of Ambu Bag</li> <li>- Stoma over-granulation management</li> <li>- Equipment breakdown</li> <li>- Accessing replacement equipment/supplies</li> <li>- Management of respiratory infections</li> </ul> </li> <li>• Basic life support and tracheostomy resuscitation training</li> <li>• Written information regarding child/young persons tracheostomy management and completed parent/carer tracheostomy teaching guideline</li> <li>• Relevant contact telephone numbers</li> <li>• Written information regarding readmission criteria</li> <li>• Information on how to dispose of clinical waste</li> </ul>		

Action	Achieved/signature	Date
Outreach training by specialist nurse regarding tracheostomy management/basic life support and tracheostomy resuscitation training for child/young persons local hospital (nursing and medical staff), community team – GP, CCN, health visitor, community paediatric physiotherapist, respite/hospice services and education (nursery/school) to be arranged, as required		
Tracheostomy sundries/supplies for discharge <ul style="list-style-type: none"> <li>• Portable suction unit</li> <li>• Appropriate sized resuscitation bag</li> <li>• Apnoea monitor (for child &lt;1 year) and sensors</li> <li>• Tracheostomy tube - same size</li> <li>• Tracheostomy tube - smaller size</li> <li>• Tracheostomy securing devices (ie collars/tape, relevant size)</li> <li>• Suction catheters (relevant size)</li> <li>• Suction tubing</li> <li>• Non-sterile gloves</li> <li>• HME filters</li> <li>• Airtight waterproof tape</li> </ul>		
Parent/identified carer(s) to be competent in all aspects of tracheostomy management, essential tracheostomy supplies, basic life support and emergency airway management and use of Ambu Bag prior to discharge  Document names and relationship to child/young person of all people tracheostomy trained/competent, with completed parent/carers tracheostomy teaching guidelines		
1		
2		
3		
4		
5		
6		
7		
8		
9		
Follow-up with respiratory service and/or ENT service – outpatient clinic appointment to be arranged, prior to discharge. Parent/carers to be informed		
Inform local hospital, Children’s Community Nurse, GP regarding discharge date. Discharge letter and relevant written tracheostomy information to be sent timeously		
Telephone follow-up by specialist nurse within week of discharge – date arranged with parent/carers		

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## **Appendix 9: Minimal occlusion technique<sup>72,73</sup>**

### **Cuff inflation**

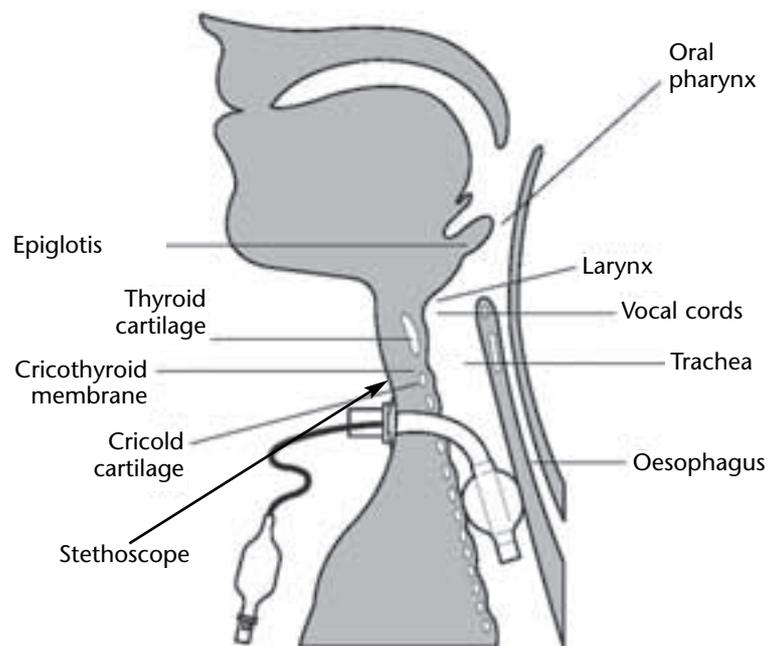
It is very important that care is taken not to over inflate the cuff on a tracheostomy tube. The tracheostomy cuff has several important functions (to prevent aspiration of upper airway secretions and/or prevent loss of airway pressure in the ventilated child/young person), however, it can also cause damage to the tracheal mucosa. An over inflated cuff can reduce perfusion to the tracheal mucosa, which may lead to ulceration, dilation and stenosis of the trachea.

Most cuffed tracheostomy tubes have a high volume, low pressure cuff – thereby, reducing the risk of trauma due to pressure. This style of cuff allows the pressure of the cuff to be diffused over a wider surface area. However, this does not eliminate the risks entirely. Therefore, the cuff should be inflated to the minimal desired occlusion volume to prevent trauma to the mucosal wall.

### Minimal occlusion volume (MOV) technique

This technique requires two people.

- When the cuff is inflated with volume (air or water depending on style of tracheostomy cuff), it is gradually inserted in 0.2–0.5mls increments with a 5ml syringe into the tracheostomy tube cuff (for paediatric cuffed tubes – adult cuff volumes will require a 10ml syringe).
- A stethoscope is positioned just below the thyroid cartilage, enabling air leaks to be heard.



- One person inserts the volume, while the second person listens for absence of an air leak as the volume is inserted.
- When no air leak is heard, the cuff is inflated to the minimal occlusion volume and, **no** further increments of volume are required.
- It is important that the volume inserted is documented in the child/young person's record for reference.
- For greater accuracy, the first person withdraws 0.5–1.0ml of air until an air leak is heard by the second person.
- The first person re-inflates the cuff until no air leak is heard by the second person, thereby confirming the amount of volume required to achieve a minimal occlusion volume.

**DO NOT EXCEED THE MANUFACTURER'S RECOMMENDED CUFF VOLUME.**

## Appendix 10: Tracheostomy suction procedure in paediatrics<sup>34</sup>

Action	Rationale
<p>Preoxygenate child/young person for one minute prior to procedure and continue until child/young person is clinically stable if:</p> <ul style="list-style-type: none"> <li>• child/young person is at risk of desaturation</li> <li>• child/young person routinely requires &gt;40% oxygen</li> <li>• child/young person has experienced detrimental effect of suctioning on a previous occasion<sup>74</sup></li> </ul>	<ul style="list-style-type: none"> <li>• To minimise hypoxia</li> </ul>
<p>Universal precautions must be used.</p> <ul style="list-style-type: none"> <li>• Clinical hand wash must be performed</li> <li>• Non-sterile gloves must be worn</li> <li>• Non-touch techniques should be adopted</li> </ul>	<ul style="list-style-type: none"> <li>• To minimise risk of infection</li> <li>• To minimise risk of contamination</li> </ul>
<p>Suction catheter should be attached to the suction tubing without touching the end of the suction catheter</p>	<ul style="list-style-type: none"> <li>• To minimise risk of contamination</li> </ul>
<p>Suction catheter should be inserted using pre-measured technique</p> <p>Tube length should be pre-determined by inserting a suction catheter into a tracheostomy the same size as the child/young person's. This measurement should be recorded in the child/young persons record<sup>75</sup></p>	<ul style="list-style-type: none"> <li>• As a point of reference for healthcare professionals</li> </ul>
<p>Deep suctioning is not recommended. However, it may be necessary in particular circumstances, eg during broncho-alveolar lavage, or for airway clearance in acutely ill child/young person with lung consolidation and/or collapse</p>	<ul style="list-style-type: none"> <li>• Animal model studies<sup>45</sup> and post mortem studies<sup>46</sup> clearly demonstrate epithelial damage where deep suction is routinely performed</li> <li>• Deep suction should never be used routinely, however in selected situations it can be necessary for clearance of secretions located beyond the tube<sup>20</sup></li> </ul>
<p>Suction should be applied to the recommended pressure (see Section 6)</p> <p>Negative pressure should be applied for the recommended duration</p> <p>Healthcare professionals must use their clinical judgement to assess if a child/young person can only tolerate shorter duration of suction based on clinical symptoms</p> <p>Suction catheter should be withdrawn as negative pressure is applied</p> <p>Assess child/young person's condition after first suction attempt</p>	<ul style="list-style-type: none"> <li>• There is increased risk of hypoxia and atelectasis in children/young people and infants due to smaller residual lung volume<sup>26</sup></li> <li>• Children/young people with impaired respiratory or cardiac function may be at increased risk of hypoxia<sup>77</sup></li> </ul> <p>To determine whether child/young person requires further suctioning</p>

Action	Rationale
If further suction is required, a new suction catheter should be used as suction catheters are licensed for single use only	<ul style="list-style-type: none"> <li>• To minimise infection</li> <li>• To comply with licensing laws</li> </ul>
If secretions are thick and offensive, a sample specimen should be collected and sent for screening	<ul style="list-style-type: none"> <li>• To establish if the child/young person has an infection or requires additional treatment</li> </ul>
<p>If the child/young person has thick or dry secretions the healthcare professional must:</p> <ul style="list-style-type: none"> <li>• assess the child/young persons hydration status, and</li> <li>• provide additional methods of airway humidification, eg a humidified air system or saline nebulisers<sup>78</sup></li> </ul> <p>Routine instillation of saline is not advised</p>	<ul style="list-style-type: none"> <li>• Dehydration affects secretion viscosity</li> <li>• Nebulised solutions decrease secretion viscosity<sup>79</sup></li> <li>• Research concludes that saline instillation can have detrimental effects for the child/young person</li> </ul>
<p>During the entire suction procedure, the child/young person must be continually monitored/observed for changes in respiratory rate, oxygenation, colour, heart rate, respiratory effort</p> <p>Any changes during the suction procedure should be documented in the child/young persons record</p>	<ul style="list-style-type: none"> <li>• To ensure patient safety</li> <li>• To note deterioration in the child/young person's condition</li> <li>• So that appropriate action can be taken if necessary</li> <li>• To influence future suction practices</li> </ul>

Table adapted from Ireton J. 2007. Tracheostomy Suction: a protocol for practice. Paediatric Nursing, 19(10), 14-18<sup>34</sup> with permission from RCN Publishing.

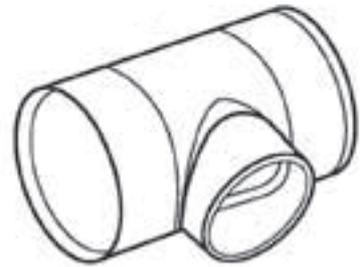
## Appendix 11: Illustrations



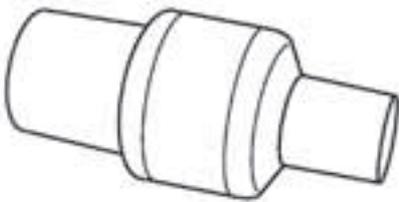
1. Humid-vent



2. Trach phone



3. Swedish Nose



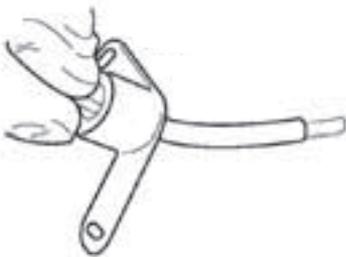
4. Thermovent



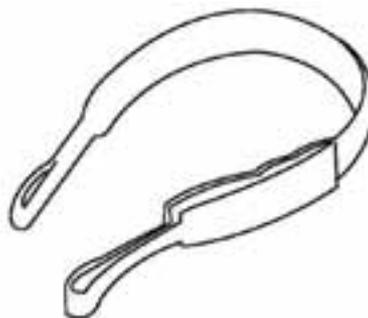
5. Portex Thermovent HME



6. Tyco healthcare tracheolife



7. Catheter with side holes



8. Velcro tracheostomy collar



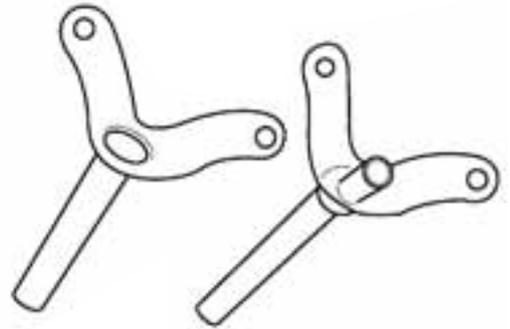
9. Humidification Bib



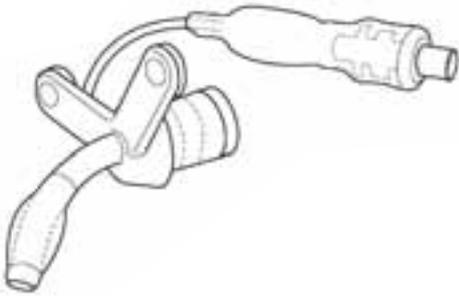
10. Heated humidifier and water chamber



11. Ultrasonic Nebuliser



12. Great Ormond Street tubes, flat and extended versions



13. Cuffed tracheostomy tube



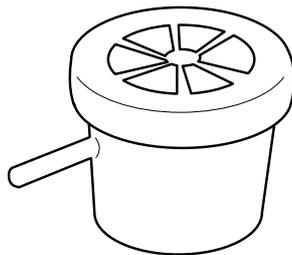
14. Portex blue line uncuffed tracheostomy tube



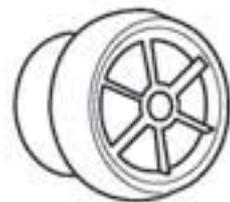
15. Single cannulated tube



16. Uncuffed fenestrated tube



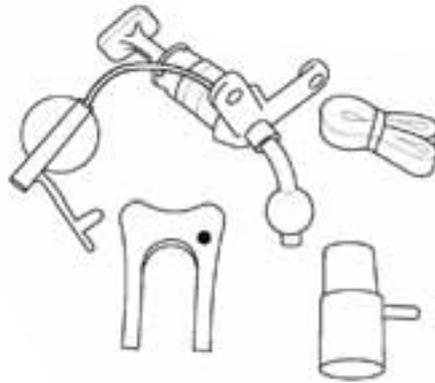
17. Speaking valve



18. Passy Muir speaking valve



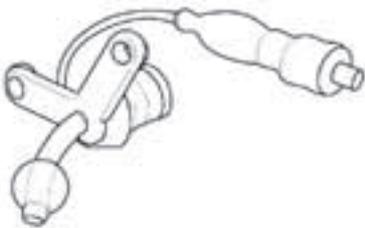
19. Passy Muir speaking valve with oxygen connector



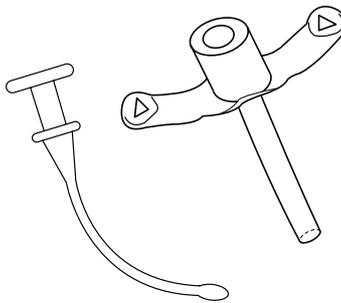
20. Smiths medical biovona fome-cuf paediatric/neonatal tracheostomy tube



21. Smiths medical biovona uncuffed paediatric/neonatal tracheostomy tube



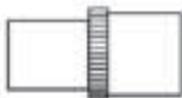
22. Smiths medical biovona aire-cuf paediatric/neonatal tracheostomy tube



23. Shiley paediatric uncuffed tracheostomy tube



24. Pharma neo port



25. Pharma neo basic

## Appendix 12: Audit tool

Please see the NHS QIS website ([www.nhshealthquality.org](http://www.nhshealthquality.org)) to download a Word version of this audit tool to save and use electronically or print to use by hand.

Section	Y	N	Do not know	Action and comments
<b>Section 1: Education and training</b>				
<b>a</b>				
Healthcare professionals have access to:				
• Education				
• Training				
• Standardised local policies or guidelines				
<b>b</b>				
All healthcare professionals who come into contact with a child/young person with a tracheostomy (no matter how infrequently) understand:				
• Indications for the tracheostomy				
• Risks associated with a tracheostomy				
• Potential complications with a tracheostomy				
• Types of tubes and equipment for each case				
• Importance of standard infection control precautions				
<b>c</b>				
Healthcare professionals and parents/carers receive training on routine and emergency airway management for children/young people with a tracheostomy				
<b>d</b>				
Healthcare professionals demonstrate knowledge of when to seek, and have access to, professional advice and assistance from relevant specialists				
<b>e</b>				
Healthcare professionals have a record of maintaining competency in caring for a child/young person with a tracheostomy				
<b>f</b>				
Education and reassurance of the child/young person and their parents/carers starts (where possible) prior to a tracheostomy being performed				
<b>g</b>				
Education of family/carers and education staff, and access to ready advice and support, is provided				
<b>h</b>				
An additional support plan including emergency guidelines is developed for nursery/school and other agencies				

Section		Y	N	Do not know	Action and comments
<b>Section 2: Communication</b>					
<b>a</b>	Healthcare professionals can demonstrate they are knowledgeable about communication problems associated with children/young people with a tracheostomy				
<b>b</b>	The key worker involves the speech and language therapist (ideally pre-operatively)				
<b>c</b>	The speech and language therapist assesses the communication skills of the child/young person.				
<b>d</b>	The speech and language therapist implements, evaluates and reviews the specific communication record				
<b>e</b>	The acute speech and language therapist refers the child/young person to the community speech and language therapist				
<b>f</b>	Clinical indicators are reviewed to ascertain whether speaking valves/tracheostomy valves should be considered				
<b>Section 3: Swallowing and nutrition</b>					
<b>a</b>	Healthcare professionals and parents/carers are knowledgeable about nutritional and swallowing problems associated with children/young people with a tracheostomy				
<b>b</b>	Speech and language therapists undertake the initial swallowing assessment and recognise when to involve the dietitian				
<b>c</b>	Dietitians undertake the nutritional assessment of the child/young person with identified impaired swallowing				
<b>d</b>	Following assessments, healthcare professionals plan, implement, evaluate and review a specific nutritional record				
<b>e</b>	Regular oral care is provided				
<b>f</b>	If the child/young person has a cuffed tube, swallowing should be assessed with the cuff deflated following medical clearance to do so				

Section	Y	N	Do not know	Action and comments
<b>Section 4: Stoma care</b>				
<b>a</b>				All healthcare professionals involved in stoma management undertake training on it
<b>b</b>				The child/young person with a tracheostomy stoma has frequency of stoma care individually assessed
<b>c</b>				An evaluation of stomal condition is documented in the child/young person's record and an appropriate plan of care initiated
<b>d</b>				The stoma is cleaned as per local guidelines/policies and no cotton wool used around the stoma. If clinically indicated, barrier film is applied
<b>e</b>				No dressings are used around the healthy stoma site unless clinically indicated
<b>f</b>				Devices securing the tracheostomy tube are checked for security
<b>g</b>				Parents/carers and children/young people (age appropriate) are taught to manage stoma care prior to discharge
<b>h</b>				Tracheostomy site is observed for signs of granulation
<b>i</b>				Healthcare professionals and parents/carers follow hand hygiene procedures

Section	Y	N	Do not know	Action and comments
<b>Section 5: Tracheostomy tube management</b>				
<b>General tube management</b>				
a				The multidisciplinary team individually assesses the most appropriate tube to be used
b				The child/young person has another tube of the same size and type and one size smaller at all times
c				If the child/young person is using a single cannula tube, it is changed at least once a week and assessed on an individual basis
d				Routine tube changes do not occur immediately before or after eating
e				The first tube change takes place 5–7 days after the surgical procedure and under medical direction
f				A note is made of the technique used to perform the tracheostomy, size and style of tube and whether it is stitched up to the skin
g				The tracheostomy tube is cleaned or replaced as appropriate
h				Brushes are not used on plastic tubes unless specifically recommended by the manufacturer
i				In addition to standard resuscitation equipment, all children/young people with a tracheostomy require the equipment listed on page 16 of the best practice statement
j				If decannulation is considered, the child/young person is individually assessed by the multidisciplinary team
k				Close monitoring and observation of the child/young person's airway and respiratory status occurs throughout the decannulation process
l				The child/young person has their emergency equipment with them at all times during the decannulation process
<b>Cuffed tracheostomy tubes</b>				
a				The cuff should be inflated to the minimal desired occlusion volume
b				Cuffed tracheostomy tubes that have air cuffs should have cuff pressure checked at least once daily maintaining pressure between 15–25cmH <sub>2</sub> O using a manometer
<b>Inner cannula management</b>				
a				Individual assessment of the frequency of inner cannula care is undertaken

Section		Y	N	Do not know	Action and comments
<b>Fenestrated tubes</b>					
<b>a</b>	The fenestrated inner cannula is removed prior to tracheal suction and replaced with an unfenestrated inner cannula				
<b>b</b>	All children/young people with a fenestrated tube require an unfenestrated tube readily accessible				
<b>Section 6: Suctioning</b>					
<b>a</b>	The lowest effective pressure is used when suctioning using equipment with an adjustable and measurable dial. See page 20 of the best practice statement for recommended pressures				
<b>b</b>	Suctioning lasts no longer than 5 seconds at a time and an appropriate catheter is used				
<b>c</b>	Suctioning is carried out using the pre-measured technique				
<b>d</b>	The need for hyperoxygenation prior to the procedure is assessed on an individual basis in line with local policies				
<b>e</b>	A plain inner tube is inserted prior to suctioning if a fenestrated tube is in situ				
<b>f</b>	Healthcare professionals are aware of the psychological effect of suctioning on children/young people				
<b>g</b>	The local infection control policy is adhered to throughout the tracheal suctioning process				
<b>Section 7: Humidification</b>					
<b>a</b>	An assessment of humidification needs is undertaken by healthcare professionals				
<b>b</b>	Mucociliary clearance and reduction in the risk of pulmonary infection is achieved with humidification				
<b>c</b>	Healthcare professionals are aware of the benefits associated with humidification device				
<b>d</b>	Healthcare professionals are aware of the particular problems associated with artificial humidification in children/young people with a tracheostomy				
<b>e</b>	Humidification systems are managed in accordance with manufacturers instructions and local policies and guidelines				
<b>f</b>	The child/young person and parents/carers are aware of the need for and appropriate use of humidification equipment				

Section	Y	N	Do not know	Action and comments
<b>Section 8: Therapeutic play interventions</b>				
<b>a</b> The child/young person in hospital has access to a qualified play specialist				
<b>b</b> Healthcare professionals have knowledge of childhood development and refer to the play specialist				
<b>c</b> Play specialists are part of the multidisciplinary team caring for the child/young person with a tracheostomy and plan, develop and evaluate structured play and developmental programmes				
<b>d</b> Education/information packs include advice on appropriate and safe play for children/young people with a tracheostomy				
<b>e</b> Parents/carers are offered psychological preparation/post procedural play programmes				
<b>f</b> Parents/carers are offered distraction therapy for any treatment undertaken				

## **Glossary**

<b>aspiration</b>	The entry of gastric secretions, oropharyngeal secretions or food and fluid into the tracheobronchial passages (airways) caused by dysfunction or absence of normal protective mechanisms.
<b>atelectasis</b>	Collapse of lung tissue preventing the exchange of carbon dioxide and oxygen as part of normal respiration.
<b>barrier film</b>	A protective barrier which may look like plastic skin and protects the skin from becoming red and sore.
<b>basic life support</b>	A sequence of events needed to try to revive a collapsed person. Basic life support for babies and children is mainly required for a breathing emergency. As damage to vital organs starts to occur after just a few minutes of oxygen shortage, it is essential that when needed basic life support is started quickly.
<b>'blue dye' test</b>	Tracheal suctioning at set intervals following the introduction of blue dye on to the tongue or by mixing dye with foods or liquids as a supplementary swallow assessment technique (the Modified Evans Blue Dye Test).
<b>catheter</b>	Hollow tube for removing secretions.
<b>cross transmission</b>	The transmission of an infectious agent from one individual to another via direct or indirect exposure.
<b>cuffed tube</b>	A tube with a balloon on the end which can be inflated with air to hold the tube in position and prevent secretions entering the respiratory tract.
<b>decannulation</b>	Removal of the tracheostomy tube allowing 'normal' respiration to occur.
<b>fenestrated tube</b>	A tube which has an opening cut into the tube wall to allow the passage of air.

<b>fiberoptic evaluation of swallowing (FEES)</b>	A flexible endoscope is placed above the epiglottis and laryngeal function is assessed before, during and after swallowing.
<b>gastrostomy</b>	A feeding tube that is inserted surgically through the abdominal wall into the stomach allowing liquid feed to be delivered directly into the stomach.
<b>hand hygiene</b>	The process of cleaning hands by performing hand washing or using alcohol hand rub solutions.
<b>heat and moisture exchanger (HME)</b>	Device to increase moisture content of inspired (breathed in) air.
<b>humidification system</b>	Equipment for maintaining moisture when giving ventilation (not necessarily always oxygen).
<b>hyperoxygenation</b>	The use of high concentrations of oxygen before and after endotracheal suction.
<b>leaked air</b>	Space between the trachea and tracheostomy tube allows expiratory air to leak up round the tube and over the vocal cords allowing voice to be produced and speech if developed to be used.
<b>minimal occlusion volume</b>	The gradual inflation of the tracheostomy tube cuff by 0.5ml increments of air until no air leak is heard - using a stethoscope held just below the thyroid cartilage.
<b>mucociliary</b>	Lining of the respiratory tract.
<b>multi-eyed catheter</b>	Catheter with numerous holes around tip.
<b>nasogastric feeding</b>	Liquid feed delivered directly into the stomach by a narrow tube that is passed into the nose and down the oesophagus (food pipe) into the stomach.
<b>oral feeding</b>	Food and drink taken by mouth.



<b>passy muir valve</b>	Referred to as 'Passy Muir (Tracheostomy) Valves' not 'speaking' valves as the valve only enables voicing to happen through expired air escaping over the vocal cords.
<b>perfusion coupling</b>	The ability to match ventilation and perfusion to each other.
<b>peristomal</b>	The area surrounding the stoma.
<b>rain out</b>	Where moisture in a gas passing through a tube or device condenses through contact with cool surfaces. Drainage or technical preventive measures may be needed since droplets can build up and reduce gas flow.
<b>single patient use</b>	Can be used more than once but on one patient only.
<b>single use</b>	Use once only and then discard.
<b>sleep apnoea</b>	A sleep disorder characterised by periods of absence of breathing.
<b>speaking valve</b>	A valve that has a one way mechanism that allows air to enter through the tracheostomy tube but closes on expiration to redirect the airflow past the vocal cords to produce voice provided that air leak is present (see passy muir valve).
<b>standard infection control precautions (SICPs)</b>	Formally agreed steps that must be used by all health and social care workers to prevent the spread of micro-organisms that may cause infection. SICPs should be used appropriately at all times in the care setting whether an infection is known to be present or not, when dealing with blood, excretions, secretions, and other body fluids.
<b>stoma</b>	The artificial opening in the patient's neck formed by the tracheostomy.
<b>suctioning</b>	The process of removing secretions.

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<b>tracheal tract</b>	The tract formed by the presence of a tracheostomy tube.
<b>tracheostomy</b>	A surgical opening in the anterior wall of the trachea (front of neck) to facilitate breathing.
<b>T-Tube</b>	A device to connect a cuffed tracheostomy tube to a humidifier.
<b>ventilator</b>	A machine used to assist breathing.
<b>videofluoroscopy</b>	An investigation that provides a comprehensive examination of swallowing function at different levels. A radiographic investigation to evaluate the status and safety of the pharyngeal swallow where small amounts of barium is mixed with food or drink and given in the normal feeding position.
<b>weaning process</b>	Attempt to help patients breathe without the aid of the tracheostomy tube or ventilator.

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## **Networks and organisations consulted**

Aid for Children with Tracheostomies

Chartered Society of Physiotherapy  
Child Health Commissioners Scotland  
Community and Health Visitors Network

NHS Education for Scotland  
NHS Health Scotland  
NHS National Services Scotland  
NHS QIS Dietetics Network  
NHS QIS Occupational Therapy Network  
NHS QIS Physiotherapy Network  
NHS QIS Speech and Language Therapy Network  
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Paediatric Group of the British Dietetic Association

Royal College of Nursing  
Royal College of Paediatrics and Child Health

Scottish Colleges Committee on Children's Surgical Services  
Scottish Government Directorate of Health and Wellbeing  
Scottish Neonatal Nurses Group

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