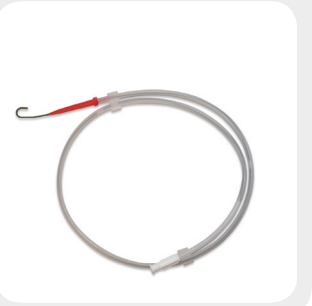

Guidelines for the Care of Patients with **Tracheostomy Tubes**

2012 Edition

St George's Healthcare NHS
NHS Trust

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With grateful thanks to all those individuals involved in previous versions of the tracheostomy guidelines at St George's Healthcare NHS Trust

Smiths Medical is delighted to have been able to support the printing of this brochure.

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Contents

Introduction

The history of the tracheostomy can be traced back to ancient times, but became accepted practice a century ago in 1909 when Chevalier Jackson described his surgical technique placing the tracheostomy between the second and third tracheal rings[1].The formation of a tracheostomy is a now a common procedure for patients with head and neck disease or those receiving prolonged ventilation in an intensive care unit. With increasing supportive technology and the development of the percutaneous technique[2] the number of patients receiving a tracheostomy has increased[3].

There is little research about the patient and carer experience of tracheostomy, the few studies available suggest that patients demonstrate significantly reduced life satisfaction and body image perception, even after decannulation[4]. The inability to communication due to the lack of speech and difficulty swallowing are common concerns, as is the fear and discomfort of suctioning and of decannulation[5-7]. These studies support the need for patients to have confidence in their carers and for carers to be competent in their practice, however although this is an expanding patient group the number of patients in hospital and in the community remains small.

St George's has long championed the needs of patients with a tracheostomy, developing and regularly updating its guidelines for care, providing study days, developing discharge guidance, initiating multidisciplinary in-patient rounds and the development of a dedicated out-patient clinic for patients with a long term tracheostomy. The aim of this activity is to deliver consistent and progressive care to patients in the acute and in the community setting.

In updating our Guidelines for the Care of Patients with Tracheostomy Tubes we aim not only to provide patients, their families and staff at St George's with a standard of care but with the help of Smiths Medical and the Trust website *http://www.stgeorges.nhs.uk/trachindex.asp* to share this with the wider community. Where possible this is based on recent evidence, however much of the care we provide to the patient with a tracheostomy is not evidenced by large multicentre randomised controlled trials, but is based on smaller studies and most commonly clinician experience. By publishing our guidelines we both hope to share our experience but also hope to learn from others and we therefore welcome comment on these guidelines

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Consultant Nurse Critical Care
May 2011

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1.0 What is a Tracheostomy?

A tracheostomy is a surgical opening in the anterior wall of the trachea to facilitate ventilation; the opening is usually maintained by use of a tracheostomy tube. The procedure may be performed either surgically or by a percutaneous method.

For further information on insertion and care, the ICS publish a set of "Standards for the care of Adult Patients with a Temporary Tracheostomy (July 2008)". A PDF can be accessed online here;

http://www.ics.ac.uk/intensive_care_professional/standards_and_guidelines/care_of_the_adult_patient_with_a_temporary_tracheostomy_2008

2.0 Indications

2.1 The patient has an obstructed upper airway

Acute upper airway obstruction, for example by a foreign object or oedema of the soft tissues, may make emergency short-term tracheostomy essential. More lasting damage to the upper airway (for example from chemical or inhalation burns) may require long-term tracheostomy.

2.2 The patient is likely to need prolonged artificial ventilation

Prolonged endo-tracheal intubation carries a high risk of damage to the soft tissues of the mouth, pharynx and trachea. It reduces the patient's ability to communicate and increases the work of breathing by extending the dead space. Tracheostomy reduces or removes the risk of tissue damage, facilitates lip-reading and reduces the work of breathing by shortening the dead space, so promoting the process of weaning from artificial ventilation.

2.3 The patient is unable to maintain an airway independently

Patients with reduced function in cranial nerves V, VII, IX, X or XII, with damage to the brain stem, or with poor conscious levels may be unable to maintain a patent airway or protect their airways from aspiration of food, drink and saliva. In these patients tracheostomy may be short- or long-term.

2.4 The patient's bronchial secretions cannot be cleared normally

A patient who is likely to be able to maintain an airway but has a poor cough may benefit from a tracheostomy.

2.5 The patient is undergoing surgery to or around the upper airway

Some maxillo-facial or ENT procedures make it necessary to secure the patient's airway without obstructing the mouth and pharynx.

2.6 Indications for laryngectomy

Laryngectomy, the removal of the larynx and diversion of the lower trachea to a permanent stoma on the lower neck, is carried out in cases of advanced laryngeal cancer which cannot be controlled with radiation therapy.

3.0 Tracheostomy Tubes

The main components of a tracheostomy tube are universal across the range of designs. The tube shaft is arc shaped and designed as either a single cannula or dual cannula (inner and outer) tracheostomy tube (Fig 3-1). It may have a cuff to provide an airtight seal, to facilitate positive pressure ventilation and reduce the risk of aspiration. For ease of insertion it is supplied with an obturator. The neck flange helps secure the tracheostomy tube to the skin of the neck and stabilise its position.

Fig 3-1 Portex® Blue Line Ultra® tracheostomy tube

Short term tracheostomy tubes have a 15mm connector to allow attachment to airway equipment. Long term tracheostomy tubes may have a low profile flange which is more discreet but cannot be attached to airway equipment. Various tracheostomy accessories exist such as speaking valves (see section 8 & 11), decannulation caps (see section 11), and HME's (see section 6).

3.1 Tracheostomy tube dimensions

The length and the diameter of the trachea are roughly proportional to the size of the individual. A tracheostomy tube should be selected according to the outer diameter, the inner diameter and the length of the tube, rather than the manufacturer's "size", which is not standardised between models nor manufacturers. i.e. a "size 8" from one manufacturer is likely to have different dimensions to a "size 8" from another (see table 1).

Table 1:

Dimensions of some size 8 standard length, cuffed, non-fenestrated tracheostomy tubes. Note the difference in inner diameter (ID), outer diameter (OD) and length.

	ID without inner cannula	ID with inner cannula	Outside Diameter	Length
Shiley LPC	n/a	7.6mm	12.2mm	81mm
Shiley DCT	n/a	7.6mm	12.2mm	79mm
Kapitex Tracheotwist	n/a	8.0mm	11.4mm	76mm
Portex Blue Line Ultra	8.0mm	6.5mm	11.9mm	75.5mm

The outer diameter of the tracheostomy tube should be about ⅔ to ¾ of the tracheal diameter. As a general rule, most adult females can accommodate a tube with an outer diameter of 10mm, whilst an outer diameter of 11mm is suitable for most adult males.[1] A tube should be no wider than necessary in order to minimize trauma to the tracheal wall and long term complications.

The inner diameter of the tracheostomy tube will influence the work of breathing in a spontaneously breathing patient and in turn the course of weaning from the ventilator. Special care is needed when checking the inner diameter of a tracheostomy tube. In the case of a dual cannula tube with the inner cannula in place, the quoted inner diameter on the packaging may or may not reflect this and may be much smaller than anticipated. In accordance with the International Standards Organisation System for size designation, when the 15mm connector is part of the outer cannula, the manufacturer is not obliged to quote the inner diameter of the inner cannula, of which use is optional.

The ideal length of a tracheostomy tube is such that the tube tip lies a few centimeters above the carina. A tube which is too short carries a higher risk of accidental decannulation or partial airway obstruction due to poor positioning. A tube which is too long may impinge on the carina leading to discomfort and coughing.

The tracheostomy tube should be fastened securely to the patient's neck. Ventilator tubing should be supported to reduce leverage on the tube with risk of tracheal injury and accidental decannulation.

3.2 Single and Dual cannula tracheostomy tubes

A non-fenestrated single cannula tube with an air-filled cuff is suitable for most adult patients who require a temporary tracheostomy during critical illness.[1]

Dual cannula tubes are inherently safer as the inner cannula may be removed quickly in the event of obstruction and are therefore preferred for patients who continue to require a tracheostomy tube after discharge from the Critical Care Unit.[1]

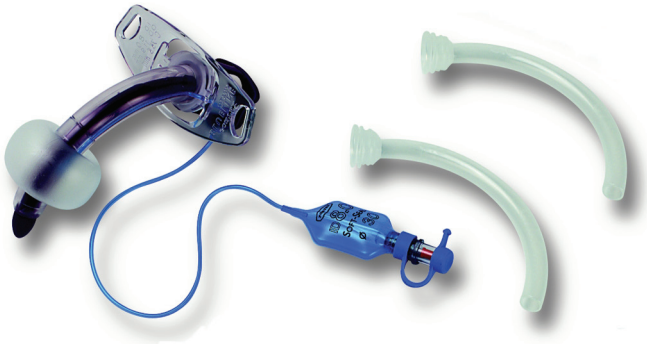

Fig 3-2: Portex® Blue Line Ultra® dual cannula tracheostomy tube shown with inner cannulae

Staff caring for these patients should be knowledgeable about the design and function of these tubes. The type and size of a tracheostomy tube should be reviewed continuously as a patient's condition changes. A wide range of specialty tubes are employed to optimise vocalization and comfort.

3.3 Fenestrated tracheostomy tubes

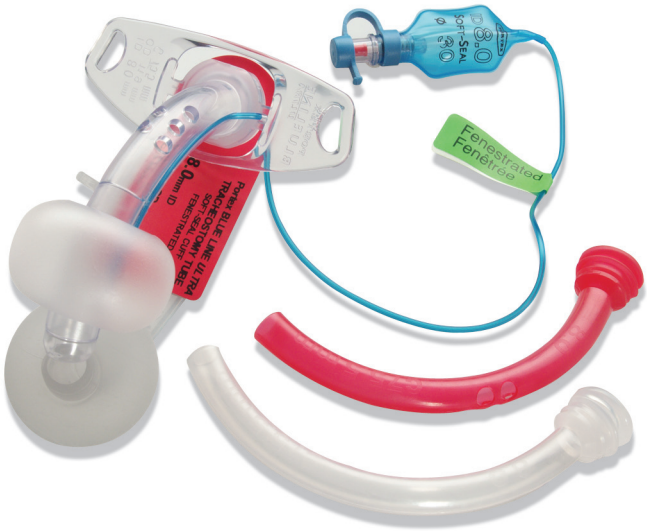

Fig 3-3: Portex® Blue Line Ultra® fenestrated tracheostomy tube. Multiple fenestrations can be seen. Red colour coded inner cannula has matching multiple fenestrations. Clear white colour inner cannula has no fenestrations

Fenestrated tubes may be considered for patients undergoing weaning from ventilation, as they facilitate speech and reduce the work of breathing in comparison to non-fenestrated tubes.

Staff should be aware that two types of inner cannulae are supplied with fenestrated tubes; one with a fenestration to promote air flow and speech; and one without a fenestration for suctioning.

Due to the risk of surgical emphysema during positive pressure ventilation even when the non-fenestrated inner cannula is in place, the use of fenestrated tracheostomy tubes is not recommended in newly-formed stomas and should be limited to such time as the wound has healed sufficiently.[2]

3.4 Cuffed tracheostomy tubes

To reduce the risk of tracheal injury, cuff management should include careful inflation technique to the minimal occlusion volume (MOV), followed by monitoring of inflation volume and cuff pressure. The cuff pressure should be maintained between 25-34 cmH_2O, but preferably at the bottom end of this range, in order to minimize the risks of both tracheal wall injury and aspiration.[3-5]

Regular monitoring of cuff pressure is recommended at every shift (8-12 hourly), after any tracheostomy-related intervention, after any change in the cuff volume or upon development of an air leak.[3] Common causes of excessive cuff pressure include undersized tracheostomy tube, poor tube positioning, overinflated cuff and reduced lung compliance.

3.5 Uncuffed tracheostomy tubes

These tubes are usually used for patients who can protect their own airway, have an adequate cough reflex and most importantly can manage their own secretions. They remove the risk of tracheal damage caused by inflation of the cuff, may aid swallowing and communication with the concomitant use of a speaking valve. However, a speaking valve can only be used in patients who have airflow through their pharynx into their nose and mouth.

Fig 3-4: Uncuffed Portex® Blue Line Ultra® tracheostomy tube

Uncuffed tracheostomy tubes are frequently used for patients being cared for in the community or a hospital ward. A dual cannula uncuffed tube is preferred for safety and comfort as removal of the inner cannula for cleaning is not traumatic to the patient. Some tubes have low profile openings to make the tube more discreet.

3.6 Standard and longer length tracheostomy tubes

Tracheostomy tubes are available in both standard and longer lengths. Standard length tubes are generally designed to accommodate patients with normal airway anatomy. However, the length and angulation of standard design tracheostomy tubes may be too short and unsuitable for some critical care patients, risking complications.[6]

Longer tracheostomy tubes are available with a fixed or adjustable flange (fixed or adjustable length).

Fixed longer length tubes may be elongated in either the proximal portion (between the stoma and the trachea) or the distal portion of the tube (within the trachea).

Extra proximal length is needed for patients with deep set tracheas i.e. large neck due to obesity, goiter, neck mass. Extra distal length is needed for patients with tracheal problems but normal neck anatomy i.e. tracheomalacia, tracheal stenosis.

A flexible (reinforced) tracheostomy tube with an adjustable flange can be used in any of the above patients, although the locking mechanism of the neck flange may prove cumbersome for the patient, making it less suitable for long term use. In these cases, a dual cannula fixed longer length tube with the appropriate proximal or distal extension for the patient's anatomy may be more comfortable.

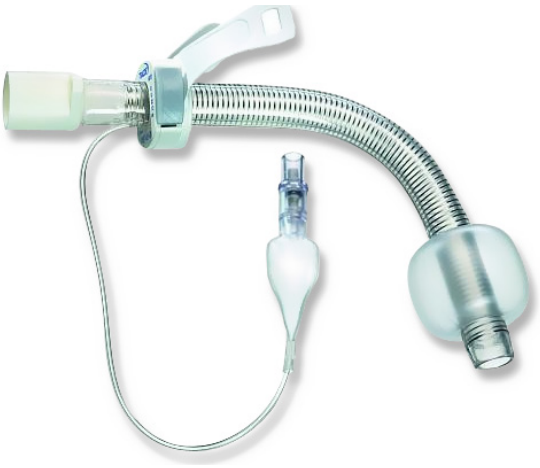

Fig 3-5: KAPITEX® Tracoe vario tracheostomy tube with adjustable flange

Fig 3-6: Portex® Uniperc® adjustable flange tracheostomy tube with Soft Seal® Cuff and Inner Cannulae

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4.0 Emergency Equipment

The following emergency equipment must be kept with an in-patient at all times; items asterisked may not always be required by patients cared for in the community.

4.1 Equipment examples

Functioning suction facilities

Photo used with the kind permission of Therapy Equipment Ltd (01707 652270)

Where centralised suction is not available, as is often the case in the community, independent portable suction units should be used.

photo used with the kind permission of MG Electric Ltd, Colchester, CO4 9HX (+44 1206 842244)

Appropriate sized suction catheters

Portex® suction catheter with control valve pictured

Yankauer sucker

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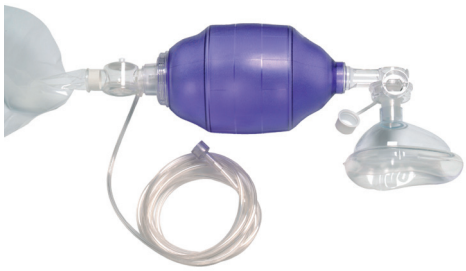

*Non-rebreathe circuit and/or adult bag valve-mask with reservoir with tubing

*Oxygen

Spare tracheostomy tubes (one of the same size and one a size smaller) usually the same type, but must be a type that can easily be inserted in an emergency situation

*Tracheal dilators

Tracheostomy disconnection wedge

*Stitch cutter (if sutures present)

Water soluble gel

5.0 Care of the Stoma

5.1 Infection control

The presence of the tracheostomy tube, the resultant secretions and stoma site in an already debilitated and possibly immuno-compromised patient all increase the risk of infection. It is therefore important that adequate infection control procedures are in place when caring for these patients.

Alcohol gel +/- Handwashing is essential both **before** and **after** all procedures.

Gloves must be worn and contaminated gloves changed between procedures. For changing the tracheostomy tube or a dressing, these should be sterile. For suctioning these can be clean rather than sterile.

Aprons should be worn at all times and changed between procedures.

Eye protection should be worn for suctioning, dressing changes and tube changes or where there is any risk a patient may cough secretions towards the carer.

Side rooms should be considered for patients with resistant organisms in their sputum (without a closed system suction) or in their stoma site. For further advice contact the infection control team.

5.2 Dressings

Secretions that collect above the cuff may ooze out of the stoma site and cause wetness around the tracheostomy site, this can cause irritation leading to skin maceration and excoriation. The site should be **assessed at least once in every 24 hours** for trauma, infection or inflammation and the findings recorded on the wound assessment chart. The back of the neck should also be inspected for signs of redness/soreness from the holder, to prevent this; a purpose-made broad, soft adjustable holder should be used. Should the skin around the stoma be wet with secretions or appear irritated a film forming acrylate barrier such as Cavilon™ may be helpful in preventing excoriation and allowing healing. The dressing and tracheostomy holder may need to be changed more frequently if they become soiled. **This is a two person technique** to prevent dislodgement of the tracheostomy. Red, excoriated or exuding stomas should be swabbed and the doctor informed. Advice should be sought from the wound care team for complicated wounds.

Equipment

Dressing pack

- Normal saline
- Pre-cut slim line key hole dressing such as Metalline™ or if large secretions use a more absorbent dressing such as Allevyn™ or Lyofoam™
- Tracheostomy tube holder
- Light source such as a pen torch or adjustable procedure light

Procedure

- This is a sterile non-touch technique.
- Explain/discuss the procedure with the patient and gain consent
- To reduce the risk of coughing, assess the patients need for suctioning and carry out suctioning if required
- Wash hands, put on gloves and apron
- Lay out dressing pack and prepare the normal saline and dressing in a sterile area
- Two nurses are required: one supports the tube for the duration of the procedure, while the other removes the tapes and removes the soiled dressing
- Remove soiled gloves, gel hands and replace gloves
- Observe the condition of the skin and the stoma, swab site if required. Clean around the stoma. If sutures are in place, identify if these are necessary to maintain tube position and remove if not required for security
- Apply dressing with the opening at the top; this may not be possible if sutures are in situ
- Secure in place with tracheostomy tube holder allowing for two fingers to fit under the holder, this may not be necessary if sutures are in situ
- Record assessment and procedure in patients records

5.3 Inner cannulae

A study in ventilated patients suggested that routine changes of the inner cannulae were not required to prevent colonisation or obstruction of the inner cannula[1]. However all the patients in this group were routinely suctioned, which may have prevented tube blockage. Anecdotally it is noted that inner cannulae can collect sputum that may cause tube blockage. Therefore, until further evidence is available we suggest that inner cannulae are regularly inspected, approximately four hourly, to prevent narrowing or ultimately blockage of the tube. It is recommended that this is done at least four hourly but this may be required more or less frequently dependant on the quantity and tenacity of the patients secretions. Disposable inner cannulae should be discarded if soiled and a new one inserted. Non disposable inner cannulae should be cleaned according to the manufacturers' instructions or with sterile water and air dried thoroughly before replacing. Due to the risk of damage to the inner surface of the inner cannula we suggest that this should not be cleaned with a brush. No studies could be found that related methods of inner tube decontamination with respiratory tract infection. However, one cross over trial identified that cleansing the inner cannula with detergent is at least as effective as cleansing using an alcoholic chlorhexidine solution in reducing colony counts found on the inner cannula[2].

5.4 Oral hygiene

Where patients cannot eat and drink they should be encouraged or assisted to maintain their oral hygiene by using a toothbrush and toothpaste and intermittently swilling their mouths with water. It is recommended that patients have regular application of 2% chlorhexidine gel or mouth wash[3-5]. Patients should have a daily assessment of their buccal mucous membranes to note for bacterial, viral or fungal infections, skin tears or ulceration. A swab should be taken of any suspicious areas, using a viral swab if a virus is suspected i.e. Herpes Simplex.

5.5 Sub-glottic secretion drainage and cuff management

There is evidence that the use of an endotracheal tube with sub-glottic secretion drainage and an appropriately inflated cuff reduces the risk of ventilator-associated pneumonia by preventing contaminated oral secretions that accumulate above the tracheal cuff in intubated

patients leaking past the cuff into the lungs [6-10]. Despite the lack of evidence it is reasonable to assume that sub-glottic secretion removal may also be helpful in mechanically ventilated patients with a tracheostomy, it has yet to be shown whether such a tube is useful outside the setting of a ventilated patient.

5.6 Tracheostomy competencies

Health care professionals caring for patients with tracheostomies should have completed their basic tracheostomy competencies (see Appendix 1)

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6.0 Humidification

A tracheostomy bypasses the normal upper airway mechanisms for humidification, filtration and warming of inspired gases. This results in increased viscosity of mucus secretions, which depresses cilary function and therefore mucocilary transport. This in turn can lead to an increased risk of infection, impaired secretion removal and microatelectasis. Failure to provide adequate humidification to address these issues can lead to obstruction of the major airways and tracheostomy tube blockage. There are various methods to provide supplementary humidification according to the patients individual needs, however it is most important to ensure the patient has adequate systemic hydration. This may be via enteral feeding or parenteral fluids; however if the patient has been assessed as having a competent swallow they may be able to maintain some or all of their own hydration through drinking.

6.1 Methods of humidification for ventilated patients

Action	Rationale
For all patients with loose or no evidence of secretions, place a Heat and Moisture Exchanger (HME) in the inspiratory circuit	To moisten inspired gases by trapping and re-breathing humidity
Replace HME every 24hours or more frequently if contaminated by secretions	To maintain effectiveness and reduce infection risk
For patients with thick secretions, ensure 4-6 hourly prescription of saline nebulisers	To loosen secretions, to prevent atelectasis and sputum thickening
Review need daily	To reduce unnecessary interventions and to assess whether present level of humidification adequate
For patients with difficult to clear secretions or evidence of consolidation, replace HME with a humidifier such as the Fischer Paykel™ water humidifier	Warmed water carries a greater relative humidity
Review need daily	To reduce unnecessary interventions and to assess whether present level of humidification adequate
In patients with very difficult to clear secretions, a mucolytic may be considered	

6.2 Self ventilating patient requiring oxygen therapy

Action	Rationale
All patients require cold water venturi humidification using an aquapak™ system	To moisten inspired gases
Check water supply 2 hourly and change system every 24 hours	To ensure adequate humidification and reduce infection risk
For patients with thick secretions, ensure 4-6 hourly prescription of saline nebulisers	To loosen and thin secretions, to prevent atelectasis and sputum consolidation
Review need daily	To reduce unnecessary interventions and to assess whether present level of humidification adequate
For patients with difficult to clear secretions or evidence of consolidation, replace cold water venturi humidifier with warm water humidifier such as the Fischer Paykel™	Warmed water carries a greater relative humidity
Review need daily	To reduce unnecessary interventions and to assess whether present level of humidification adequate
In a patient with very difficult to clear secretions, a mucolytic may be considered	

6.3 Self ventilating patient not requiring oxygen therapy

Action	Rationale
For all patients with loose or no evidence of secretions use an HME. The buchanon™ protector should be used for longer term patients and is preferable in patients with copious secretions where there is a risk of tube occlusion	To moisten inspired gases by trapping and rebreathing humidity, to prevent inhalation of particulate matter
In the acute ward replace HME every 24hours or more frequently if contaminated by secretions (check four hourly)	To maintain effectiveness and reduce infection risk
For patients with thick/dry secretions, ensure 4-6 hourly prescription of saline nebulisers	To loosen and thin secretions, to prevent atelectasis and sputum consolidation
Review systemic hydration – inform medical staff	To highlight problem and introduce an early intervention where required
Review need daily	To reduce unnecessary interventions and to assess whether present level of humidification adequate
In a patient with very difficult to clear secretions a mucolytic may be considered	

7.0 Secretion Removal

Please refer to St George's Hospital Suction Policy Clin 4.7 (PAT .19) 'The management of a patient requiring suctioning' for greater detail.

7.1 Assessment

Suctioning into the tracheostomy tube should not be a routine procedure. The patient must be assessed for signs of sputum in the airways. Where the patient can cough secretions independently into the top of the tracheostomy tube these secretions can be can be removed with a clean yankauer sucker or tissue

7.2 Equipment

- Gloves, apron and goggles
- Functional suction unit (wall or portable)
- Appropriately sized suction catheters (size of tube -2 x2)[1] , this formulation was devised for endotracheal tubes greater than size 6mm assuming the patient was receiving oxygen. Therefore it may be appropriate to adjust the size in patients who have size 6mm or smaller tubes and those without an inflated cuff
- Water to clean suction tubing

7.3 Procedures (adapted from Day et al 2002[2])

- Assess patient for signs of airways secretions unable to be independently expectorated.
- Discuss the need for suctioning with the patient gaining consent for the procedure where possible[3]
- Pre-oxygenate patients who are receiving supplemental oxygen[4] for 30 seconds to 2 minutes[5]. In COPD patients this should be no more than 20% above baseline.
- Wash hands, put on goggles[6], gloves and an apron
- Set suction pressures to 10.6-20Kpa (80-150mmHG)[7,8]. Ensure that applied suction pressure is no greater than 20kpa by occluding the suction tubing with a gloved thumb[2]
- Select an appropriately sized catheter. Insert the suction catheter without suction, to the carina to cause a cough and then withdraw 1cm[9,10] , if the patient can cough this may not be necessary[11] and the catheter need only be inserted to the length of the tracheostomy tube
- Apply continuous suction[12] on withdrawal only[13-15], this should take no longer than[10-15] seconds
- Reapply oxygen if required by the patient, within 10 seconds of completing suctioning[16], reducing the level of inspired oxygen to pre-suctioning parameters[17]
- Reassess patient, reapply suction if required. Ideally suction no more than three times in any one episode[12]
- Reassure patient post suctioning
- Document suctioning and patient response
- Flush suction tubing with water
- Wash and gel hands

The instillation of normal saline, to facilitate sputum clearance, is not recommended practice, and it may actually be harmful (Blackwood 1999, Kinloch and Rock 1999)[18,19]. Instead, humidification of inspired gases and saline nebulisers (0.9 or 5%) should be considered.

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8.0 Communication

8.1 The importance of communication

- Communication is the sharing of experiences, events, ideas and feelings through verbal (sounds, words, sentences) and non verbal (body movement, tone of voice, touch) channels
- Communication permits us to interact as human beings. It serves a number of functions including controlling, sharing of feelings, informing, understanding, imagining and sustaining social relationships
- In the medical setting, communication is an important skill required in order for the patient to give informed consent about their treatment
- Patients requiring a tracheostomy are acutely ill and disabled. The effects of the drug treatments along with the acute nature of their medical condition may render them unable to breath for themselves and require an ICU admission, they may have a degree of physical weakness. Although this is a temporary situation and many patients may make a good recovery, the psychological effects can be long lasting. One of the most difficult things for a patient to cope with, is the inability to communicate. Communication difficulties are also associated with increased length of stay on ICU due to patient's inability to participate in goal setting, treatment and end of life decisions.
- Where appropriate, the patient/relatives should be informed, before the tracheostomy procedure, that they might be unable to create a voice while the tracheostomy tube is in place, as air is no longer passing through the vocal cords (a patient information sheet is recommended). They should be reassured that it is expected that the voice will return once the tube is removed or manipulated (except when a laryngectomy has been performed) and the nursing, medical staff and relatives will provide the patient with alternative means of communication until then.
- Communication serves to meet many patient needs including "social interaction, information giving, reassurance, discussion of feelings, advice and counselling" [1]
- "The purpose of communication for critically ill patients is to help them maintain their identity as well as psychological, structural, personal and social integrity" [1]
- The psychological status of the patient must be considered as they may be unable to speak and will often be anxious in the hospital environment.
- The role and responsibility of the Speech and Language Therapist is as a communication specialist is to facilitate communication and to ensure equitable communication and person time for all patients. Initial assessment of the tracheostomised patient usually occurs within the critical care setting, so the patients medical status needs to be taken into consideration and assessment needs to be functional and adaptable to the patient's needs.

8.2 Non verbal communication – Methods to consider

Lip Reading
Ask the patient to exaggerate their lip movements. Encourage use of short but complete sentences in order to make the message clearer. Look for key words to aid your understanding. This will require adequate oro-motor ability.

Facial Expression and Gestures
Concentrate on facial and body expressions which will add extra information to the patient's "mouthed" words.

Coded Eye Blink or Hand Gesture
Instruct the patient to blink once for "yes" and twice for "no" in response to your questions. Alternatively consider thumbs up for "yes" and down for "no", or any clear hand movement that the patient can achieve.

Alphabet Board, Picture Board and Phrase Books
Laminate A4 sheets displaying the alphabet in large letters, or simple pictures depicting basic activities/needs (e.g. drink, toilet…). These systems can be supplemented by a list or book of useful phrases for the patient (e.g. "Please call my husband"). Communication boards can be individualised for each patient by the Speech & Language Therapist.[2]

Electronic Larynx and Electronic Communication Aids
It is necessary for the Speech & Language Therapist to assess the patient for use of one of these aids, and then, if appropriate, advise the patient, family, carers and staff on its use. Use of these aids requires the patient to develop an adequate level of skill, therefore may not be suitable for short term use.

8.3 Verbal communication – Methods to consider

Manipulation of the Tracheostomy Tube for Communication
Voice production may be achieved in patients with a tracheostomy tube by using one or more of the following:

Cuff Deflation
Deflation of the cuff of the tracheostomy tube will allow air to pass into the upper airway on expiration. Phonation will be achieved as air is directed into the larynx, however the strength of the voice may be weaker as some air will pass out of the open tracheostomy.

Fenestrated Tracheostomy Tube
Use of a fenestrated tracheostomy tube also allows air to pass into the upper airway on expiration, thus producing voice. It is essential to remove a non fenestrated inner cannula if in-situ. The fenestration needs to be patent, as in some occasions the fenestration is in contact with the tracheal wall, thereby not allowing airflow through the fenestration. Re-adjustment of the patient's head/ shoulders can be attempted to unblock the fenestration

Downsizing of Tracheostomy Tube
Use of a smaller tracheostomy tube will allow increased passage of air between the tube and the tracheal walls on exhalation but it will also increase the work of breathing as the resistance to air flow is increased. This will therefore need to discussed with the MDT.

Intermittent Finger Occlusion
Intermittently occluding the tracheostomy tube with a gloved finger will allow for effective voicing in many patients. To use this technique the patient should ideally be able to tolerate cuff deflation, but if not must have a fenestrated tracheostomy tube (with fenestrated inner cannula) in place.

One Way Speaking Valve
One-way speaking valves can be used very effectively with tracheostomised and ventilator dependent patients. Use of a one way speaking valve is dependent upon the patient's ability to tolerate cuff deflation[3].

Figure 8.1 Portex® Orator one-way speaking valve

This type of speaking valve has a one-way mechanism where the valve opens on inspiration, allowing air to enter the airway via the tracheostomy, however closes on expiration, forcing air into the upper airway and larynx to allow for phonation.

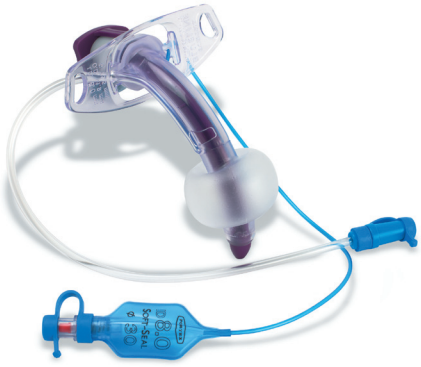
Figure 8.2 "Passy Muir" tracheostomy and ventilator speaking valves

For the patient who is ventilator dependent and can tolerate cuff deflation, the "Passy-Muir" valve should be considered.[3]

8.4 Talking tracheostomy tube

Patients unable to tolerate cuff deflation, (eg. ventilated patient), should be considered for use of a vocalaid tracheostomy tube. Air from an external source is delivered above the cuff to allow airflow through the larynx for phonation. This may allow the tracheostomised patient to communicate verbally, however as the airflow is reduced, voice may be weak.

Fig 8.4 Portex® Vocalaid / Suctionaid Blue Line Ultra® tracheostomy tube

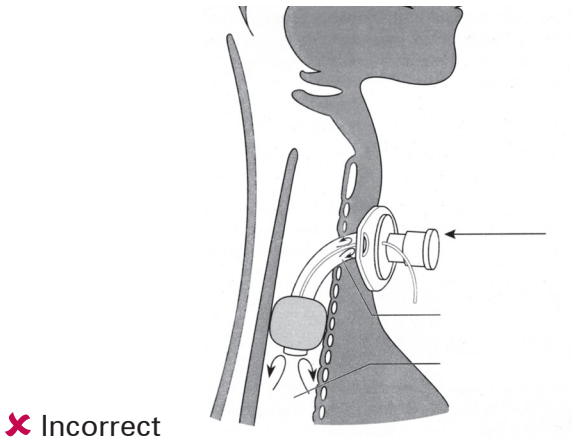


The Speech & Language Therapist will be able to provide information and advice on achieving the most appropriate communication system for the individual patient.

BOX 8.1 Procedure for using a One Way Speaking Valve - Self ventilating patient

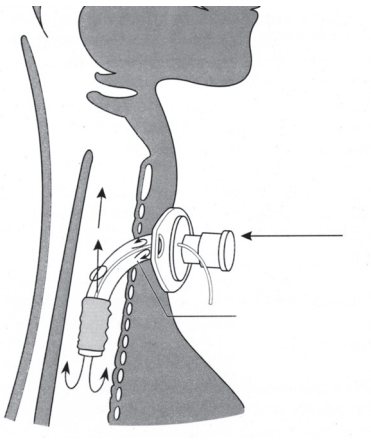
Action	Rationale
The patient must have SpO_2 levels monitored using a pulse oximeter	To obtain the patient's correct baseline status
Where possible the patient must fully understand the procedure and its mechanism, explanation is therefore essential.	To reduce the anxiety of the patient which can influence the success of the voice production.
If using a non-fenestrated tube the cuff must be DEFLATED (see fig 8.4a and 8.4b) (medical agreement should be obtained) and the inner cannula should be removed if not fenestrated.	If the cuff is inflated when using a non-fenestrated tube, air is unable to pass through the vocal cords and a voice cannot be produced. The patient's respiration will be compromised.
If humidified oxygen or air is required, this can be placed over the speaking valve in the normal manner	To maintain consistent environment for the patient throughout the assessment.
Once the speaking valve is in place, instruct the patient to breathe in (via the tracheostomy tube) and blow out gently through the mouth.	The patient will not be used to normal breathing, especially if the tracheostomy tube has been in place for some time.
Begin trial attempts at phonation by asking the patient to say "ah" or count from "one" to "five".	Automatic speech such as counting is often easier for the patient than spontaneous speech.
If the patient's voice sounds "wet" or "gurgly" ask them to cough and clear secretions.	Any secretions present that may affect voice clarity.
Monitor carefully and liaise with the other team members regarding the weaning plan (see section 11.0).	Remove the speaking valve if: • Respiratory difficulty occurs • SpO2 levels decrease • The patient becomes fatigued • The patient requests it

Action	Rationale
Always refer to the Speech & Language Therapist's advice in the medical and nursing notes and the weaning plan.	
If indicated, remove the speaking valve at the end of the trial period, re-inflate the tracheostomy tube cuff using the MOV technique, checking cuff pressure.	
Clean and dry the speaking valve according to manufacturers guidelines and store in a named sealed container.	
Document all actions on the weaning plan.	To ensure effective communication amongst the multidisciplinary team.



✘ Incorrect

Figure 8.4a Speaking valve used in the presence of an inflated cuff preventing exhalation



✓ Correct

Figure 8.4b Speaking valve with cuff deflated

BOX 8.2 Procedure for using a Passy Muir Speaking Valve (PMV) inline with ventilator

Action	Rationale
Obtain medical agreement prior to commencing procedure.	Patient needs to be medically stable and weaning from mechanical ventilation, in order to ensure that patient is safe to tolerate cuff deflation and ventilator adjustments.
Where possible the patient must fully understand the procedure and its mechanism, explanation is therefore essential.	To reduce the anxiety of the patient which can influence the success of the voice production.
Look for evidence of reduced airway patency – Patient history, bronchoscopy results, ABGs.	
Ideally the patient should be on a pressure support of $\leq$ 15 - 18 cmH_2O and no $\geq$ 8cmH_2O of PEEP.	To ensure minimum ventilator support is required.
Check RR/HR/ SpO_2	To ensure within normal limits for the patient.
Determine potential changes to ventilation modes and O_2 therapy.	To allow for air leak within the ventilator system.
Suction orally and via trache tube prior to cuff deflation.	To ensure minimum residual secretions during procedure.

Action	Rationale
Cuff Delation procedure Slowly deflate cuff while carrying out synchronous suction. Check for airflow at mouth Know your ventilator! It is best to use the NIV mode on your ventilator while using the passy muir valve.	To ensure that cuff deflation is tolerated. Signs of intolerance: •Increased coughing •Increased respiratory rate •Respiratory effort •Need for suction increases •SpO_2 levels decrease If signs of intolerance are observed, please remove valve, re-inflate cuff and do not proceed any further without further reassessment.
Once the patient is tolerating cuff deflation insert the Passy Muir valve into the ventilator circuit as close to the trache as possible.	
Assess patients ability to phonate	To ensure supraglottic airflow. Remove the speaking valve if: • Respiratory rate/ effort increases • Heart rate rises • SpO_2 levels decrease • Patient experiences distress / discomfort • No supraglottic airflow • Weak/ breathy/ hoarse voice • Inspiratory/ expiratory stridor • The patient requests it
If the patient's voice sounds "wet" or "gurgly" ask them to cough and clear secretions.	Any secretions present may adversely affect voice clarity.
Monitor RR/Sats/WOB carefully and liaise with the other team members regarding the weaning plan.	Remove the speaking valve if: • Respiratory difficulty occurs • SpO_2 levels decrease • The patient becomes fatigued • The patient requests it
If indicated, remove the speaking valve at the end of the trial period, re-inflate the tracheostomy tube cuff if indicated using the MOV technique, checking the cuff pressure with a manometer.	
Clean and dry the speaking valve according to manufacturer's guidelines and store in the box provided by manufacturer with the patients name on it.	
Document all actions on the weaning plan.	To ensure effective communication amongst the multidisciplinary team
If the initial trial is successful and it is agreed to continue with its use please place the aqua marine sticker provided in the speaking valve pack onto the pilot balloon line which states that when this valve is used the cuff must be deflated first.	

8.5 Contradictions for speaking valve use

- Inability to tolerate full cuff deflation
- Airway obstruction
- Unstable medical/pulmonary status
- Laryngectomy
- Severe anxiety/cognitive dysfunction
- Anarthria
- Severe tracheal/laryngeal stenosis
- End stage pulmonary disease

If communication is particularly difficult or further advice is needed, please contact the Speech & Language Therapy department.

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9.0 Swallowing

9.1 Bedside evaluation of swallowing, eating & drinking

Not all patients with tracheostomies will have swallowing problems.[1-3] Speech and Language Therapists (SLT) are only involved in the assessment and management of tracheostomised patients who present with swallowing or specific communication difficulties (see section 8.0).

An assessment of swallowing function by an SLT is required prior to the commencement of oral feeding in patients, identified as being at risk of dysphagia. This is to reduce the risk of aspiration, which may lead to aspiration pneumonia.[4] A multi-disciplinary approach is recommended to ensure appropriate and effective care for the individual patient.

"If the complex interrelation between deglutition (prolonged artificial feeding) and respiration is disrupted, significant impairment can result. Additionally, due to the shared functions of the hypopharynx and the larynx, the impact of dysphagia is often heightened for the individual with respiratory compromise".[5]

The evidence around the effects of a tracheostomy tube is controversial, but suggests that the following may occur in the presence of a tracheostomy tube:

- Reduction of antero-superior movement of the larynx[4,5,6]
- Tracheal irritation at rest and during swallowing[1]
- Reduced laryngeal closure[5]
- Compression of the oesophagus by the tracheostomy tube cuff [7]
- Reduced subglottal air pressure[8]
- Reduction or elimination of airflow through the glottis
- Blunting of the reflexive cough[9]
- Non co-ordination of the glottic closure response[10]
- Reduced laryngeal sensitivity[6,11,12]
- Disuse atrophy of the laryngeal muscles

Oral Intake for tracheostomised patients who do not present with dysphagia

While it has been suggested that oral intake should be considered and offered only when the tracheostomy cuff is deflated, new evidence has shown that cuff deflation does not result in swallowing success or increased swallowing safety.[13,14] It is, therefore recommended that patients be assessed on an individual basis. Cuff deflation must be assessed by a proficient practitioner in order to minimise the effects of over- inflation of the cuff which can result in laryngeal trauma.

When to consider a referral to the speech & language therapy department for swallowing assessment

- Referral would be appropriate for tracheostomised patients with:
- Neurological involvement e.g. bulbar involvement
- Head & Neck surgery
- Evidence of aspiration of food/fluid/oral secretions on tracheal suctioning
- Persistent wet or weak voice when cuff is deflated and speaking valve or decannulation cap in place.

- Coughing in relation to oral intake
- Oxygen desaturation in conjunction with oral intake
- Patient anxiety or distress during oral intake

Oral Intake for Tracheostomised Patients following Head & Neck Surgery –
It is recommended that the SLT perform a detailed assessment of this patient group; ideally at the pre-operative stage.

BOX 9.1 Procedure for oral intake in tracheostomised patients who do not present with dysphagia

Action	Rationale
Sit the person upright in the bed or in a chair, with the chin flexed slightly towards the chest	Aspiration risk is increased if the patient is semi upright with the neck extended.
Suction the tracheostomy tube simultaneously with cuff deflation.	Secretions may pool above the inflated cuff. When the cuff is deflated these secretions may enter the lungs.
Check the voice quality and cough by occluding the tracheostomy tube (with a gloved finger or gauze pad) or by using a speaking valve and ask the patient to say "ah" or count out loud, "one" to "five".	If the patient's voice is wet or "gurgly", this could indicate difficulty managing their own secretions and an aspiration risk.
The patient who can successfully tolerate cuff deflation should be trialled with a speaking valve. If tolerated the patient should be encouraged to wear the speaking valve during oral intake. If the patient is using a speaking valve attach it to the connection on the tracheostomy tube.	Although use of a speaking valve during oral intake is not considered essential[15,16] it will maximise supraglottic airflow and enable voice quality to be monitored. A "wet" voice quality is considered a predominant indicator of aspiration[17]
Check: a. The weaning plan to ascertain length of time speaking valve can be tolerated. b. That the inner cannula is removed if not fenestrated when a fenestrated tracheostomy tube is in situ.	
If the voice is clear, proceed with trials of small sips of water. If voice quality deteriorates and sounds wet, encourage the patient to clear any secretions by coughing and re-swallowing	It is recommended that all patients commence oral intake with sips of water to establish their ability to swallow safely before they proceed to other fluids and solids[1]
Trials of other fluids and solids can be conducted following success at this level	
Cease the oral trial if: • The patient's condition deteriorates • The patient becomes fatigued • Voice is consistently sounding wet • Persistent coughing is evident (in association with eating and drinking) • There are signs of aspiration on tracheal suction • If indicated by the patient's respiratory status (e.g. signs of distress, increased respiratory rate, decreased SpO2)	
Referral to SLT should be implemented if any of the above signs are noted	

BOX 9.2 Procedure for bedside evaluation of swallowing by a speech & language therapist

In cases where dysphagia is suspected, a referral is accepted from any member of the multidisciplinary team and confirmed with the medical team, if required, prior to the SLT assessing the patient.

Action	Rationale
The SLT will initially carry out a clinical assessment of the patient's swallowing ability. This will include:- • Obtaining information pertaining to medical history and current admission • Reason for the tracheostomy • Type and size of tracheostomy tube • Current method of ventilation • Frequency of suctioning • Ability to tolerate cuff deflation • Full oro-motor assessment • Establishment of basic communication status and cognitive function	To ensure that all background information and current cognitive, neurological and structural information has been established.
Eye protection should be worn by staff throughout the assessment and universal precautions adhered to.	To reduce the risk of cross infection from the patient's secretions via the unprotected mucous membrane of the eye.
Medical agreement will be obtained prior to cuff deflation.	The patient should not be at risk of aspiration. Cuff deflation during ventilation will affect the delivery of respiratory support
Following agreement from the medical team (this must be recorded in the medical notes), cuff deflation trials can commence.	Liaison with the MDT is essential to ensure all information regarding the patient is accurate.
If the medical team will not permit cuff deflation the SLT should explain the limitation of a swallowing assessment in the presence of an inflated cuff and a team discussion on the management of the individual case should follow.	The medical team may be considering quality of life issues.
Regular suctioning should be available throughout by nursing or physiotherapy staff. They therefore must remain in attendance at all times.	To ensure a clear airway.
If the patient is ventilated, a trained member of the MDT, will be required to make the necessary modifications to the ventilator settings.	To silence ventilator alarms.
The patient's response to cuff deflation will be monitored: • Respiratory rate • Fatigue • SpO2 levels • Signs of distress	To ascertain tolerance for cuff deflation.
In the patient who has a fenestrated tracheostomy tube, ensure that the inner cannula is replaced by fenestrated inner cannula if available, or removed if not.	To maximise airflow through to the glottis.
Finger occlusion of the tube or speaking valves can be used at this stage if tolerated.	Increased airflow is directed through the larynx that stimulates subglottic receptors before the swallow and may improve vocal cord closure[1] . Expiratory airflow can assist in clearing the larynx following the swallow and determine upper airway patency.

Action	Rationale
Assessment of the patient's ability to produce voice, and cough into the mouth should occur.	It is important to establish a baseline of vocal quality and strength of cough prior to the introduction of oral intake.
Assessment of the patient's swallowing function should occur, and will include: • Saliva swallow • Water swallow • Progression onto other liquids and solids if appropriate	
Judgement of the oro-pharyngeal swallow and safety for commencement of oral intake will be based on the patient's performance in a number of clinical parameters. These will include: • Level of alertness and cognitive awareness • Laryngeal competency and voicing ability • Strength of reflexive and spontaneous cough • Risk of aspiration	Impairment in laryngeal function may pose an increased risk of aspiration during oral intake. Consideration of a referral to the ENT department should occur. A reduction in strength of cough may not enable the patient to expectorate aspirated materials from the airway. Liaison with the physiotherapist to ascertain the true level of function should occur. Obtaining an accurate assessment of aspiration risk is difficult from a clinical assessment of swallowing function conducted at the bedside.[1,18] Further objective methods of evaluation may be required, prior to implementation of any oral intake regime.
Clinical signs to consider following oral intake in determining aspiration risk include:- • Delay in elicitation of the pharyngeal swallow • Alteration in voice quality or a "wet" sounding voice • Consistent coughing • Increased respiratory rate/SOB • Reduced oxygen saturation level • Patient distress • Need for suctioning • Presence of liquid or food in tracheal secretions or around the tracheostomy tube site.	

Further assessment information may be obtained through use of:

Fiberoptic Endoscopic Evaluation of Swallowing (FEES) [19,20]
Allows direct visualisation of pharyngeal and laryngeal anatomy and physiology before, partially during, and after the swallow[21] at the bedside with critically ill or immobile patients, or in a clinic environment. Appropriate training in the FEES procedure is essential for all SLT's prior to use of this tool clinically.

Videofluoroscopy
Videofluoroscopy enables radiographic visualisation of the swallow, the triggering of the pharyngeal swallow in relation to the bolus and the motor aspects of the pharyngeal swallow[1]. The SLT should be aware of the appropriateness of all these assessment measures for the individual patient. A competent practitioner must conduct all assessment procedures.

Other Assessment Techniques
Cervical Auscultation may be an adjunct to assessment, although its use is controversial [22,23,24,25]
Cervical auscultation is a technique used to detect sounds of a swallow via a stethoscope placed on the larynx.

It may :
- Determine upper airway sounds prior to the swallow trial
- Determine the point in the respiratory cycle in which the swallow occurs
- Determine a change in upper airway sounds post swallow.
- Be used to detect a swallow when laryngeal palpation is difficult

9.2 Management of dysphagia

After the Speech and Language Therapist has assessed the patient's swallowing function, recommendations regarding swallowing management will be made. This should take the swallow assessment results and the MDT assessment of the patient into consideration.

Speech and Language Therapy intervention may recommend a range of interventions depending on the patient and the type of dysphagia. Russell and Matta[26], list the following types of intervention:

Indirect therapy
This does not involve the introduction of a food/ fluids, but focus on the aspects of the swallow that have been identified as "abnormal." These generally include a range of motion exercises and swallowing manoeuvres e.g. Falsetto – to increase laryngeal range of motion, Maseko –to increase tongue base retraction [1,27]

Tracheostomy tube manipulation
Tube manipulation may be used to attempt to "normalise" a patient's swallow, in order to improve swallow safety. e.g. The SLT might recommend down sizing a tracheostomy tube.

Diet Changes
The SLT may recommend modified food/fluid consistencies to optimise swallow safety. This may require liaison with the dietician

Positioning
The optimum safe position for swallowing is sitting upright with the chin slightly flexed. This may not be possible for some patients, so the SLT may make recommendations as to the safest position for swallowing.
Postural techniques and manoeuvres that can be used to increase swallow safety may also be recommended e.g. Head tilt or Mendelsohn's manoeuvre.

Non-oral feeding
If the SLT recommends that a patient should be nil-by-mouth or that they can only begin oral trials, the patient may require alternative forms of feeding to maintain nutrition and hydration. The SLT will refer to the dietitian, in this instance. The SLT will also be involved in the multidisciplinary decision making process for long term non-oral feeding options.

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10.0 Changing a Tracheostomy Tube

Tracheostomy tubes may be changed electively or require replacement under emergency conditions due to tube blockage, accidental decannulation or displacement (see Chapter 13).

10.1 Elective changes

Recommendations for the frequency of changing tracheostomy tubes are unsupported by the literature. A European Economic Community Directive[1] states that surgically invasive devices intended for short-term use are in Class IIa and therefore normally intended for continuous use for not more than 30 days. In practice the frequency of tracheostomy tube change should be assessed on an individual patient basis taking into account:

For the first change:
The procedure used to form the stoma (Surgical stoma not before 72 hours and percutaneous ideally 7-10 days[2])

For subsequent changes:

- The design of the tracheostomy tube – It is thought to be good practice to change a single lumen tracheostomy every 7-14 days to prevent tube blockage with secretions
- The purpose of the tracheostomy i.e. downsizing for weaning or fenestrated tube for speech
- Patient discomfort and trauma to the stoma site

When planning a tracheostomy tube change always consider:

- Is this the best time to be doing this?
- Am I the best person to do this?
- Is the patient adequately/appropriately prepared?
- Have I got all the essential/appropriate equipment?
- Is there adequate support?

10.2 Who should change the tube?

The person changing the tube is chosen according to the risk to the airway. The highest risk is the first change in a newly formed stoma or where there is airway compromise. In these situations it is recommended that the individual either possesses advanced airway skills or has immediate access to someone with those skills and has notified that person immediately prior to the tracheostomy tube change, in case of an emergency arising. Any tracheostomy change should be undertaken by a practitioner who has demonstrated appropriate competence (see Appendix 3).

10.3 The procedure for changing a tube

The type of tracheostomy tube used should be tailored to the patients' condition and will depend on various factors such as length of weaning time, original reason for tracheotomy and type of secretions.

This is a two person technique, with one person supporting the tube and the patient and the other performing the change. In patients who are at risk of aspiration it is recommended that any enteral feed be stopped 3-4 hours prior to the procedure and the enteral tube aspirated immediately prior to the procedure. The procedure used for changing any tracheostomy tube will depend on the circumstances of that change. There are two commonly used methods:

- Guided exchange using a tube exchange device -usually required for early changes and for patients with a high risk of airway loss
- Blind exchange using an obturator – for patients with formed stomas and a low risk of airway loss

10.4 Equipment

- Dressing pack
- Suture cutter
- Appropriately sized tracheostomy tube and one a size smaller
- Tracheostomy tube holder
- 10ml syringe for cuffed tubes
- Water-soluble lubricant
- Sterile normal saline
- Pre-cut slim line key hole dressing such as Metalline™ or if large secretions use a more absorbent dressing such as Allevyn™ or Lyofoam™
- Gloves, apron and protective eye wear
- Tracheal dilators
- Functioning suction unit and appropriate sized suction catheters
- Stethoscope
- Airway exchange catheter
- Resuscitation equipment
- Microbiological swab

Fig 10-1: Portex® Tracheal Tube Inducer and Guide

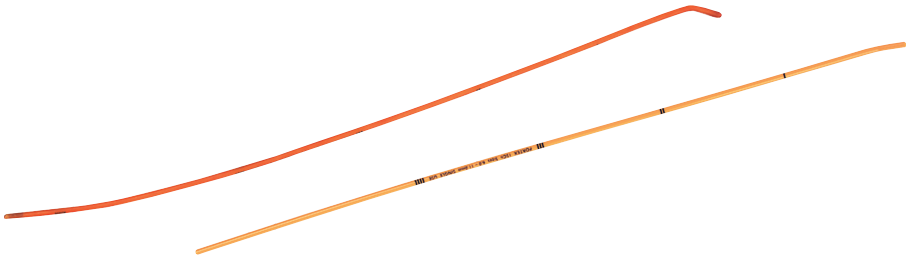
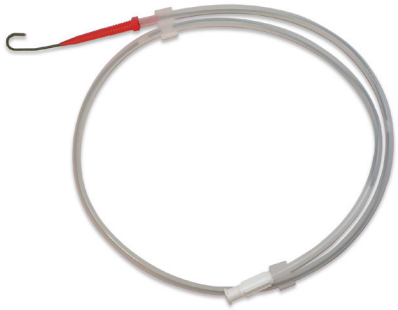


Fig 10-2: Airway Exchange Guidewire



10.5 Blind exchange using an obturator

- Check emergency equipment
- Explain procedure to patient and gain patient consent
- Position patient in semi-recumbent position
- Where required pre-oxygenate
- Ensure assistant is clear regarding what is expected of them
- Check and lubricate tube
- Insert obturator
- Ask assistant to suction if required, remove old dressing, inner cannula and tapes and support tube
- (Deflate cuff with suction applied)
- Remove tube on expiration
- If patient not oxygen dependent and stoma well formed, observe site, swab if site looks infected and clean stoma
- Insert tube on expiration, remove obturator (inflate cuff)
- Check for airflow through tube. Identify presence of CO_2 using a CO_2 detector
- Ask assistant to support the new tube
- Dress and apply holder
- Replace inner cannula where used
- Check patient is stable (and cuff pressure)
- Document procedure in the case notes using printed label where available and check patient again. If using a fenestrated tube, place spare inner cannula in emergency pack and clearly label tube

Fig 10-3: Portex® CO^2 detector

10.6 Guided exchange using an airway exchange device

- Check emergency equipment
- Explain procedure to patient and gain patient consent
- Position patient in semi-recumbent position
- Where required pre-oxygenate
- Ensure assistant is clear regarding what is expected of them
- Check and lubricate tube
- Ask assistant to suction if required, remove old dressing, inner cannula and tapes and support the tube
- Insert exchange device to length of tube
- Ask assistant to deflate the cuff
- Remove old tube over exchange device
- Insert new tube over exchange device
- Check for airflow through tube. Inflate cuff.
- Remove exchange device. Identify presence of CO_2 using a CO_2 detector
- Observe site, swab if required and clean while assistant support the tube
- Dress and apply holder
- Replace inner cannula
- Check patient is stable (and cuff pressure)
- Document procedure in the case notes using printed label where available and check patient again. If using a fenestrated tube, place spare inner cannula in emergency pack and clearly label tube.

10.7 If unable to re-insert tube successfully or the patient become compromised

- Call the on-call anaesthetist/ENT/Resus team immediately and as appropriate to the situation, to assist and/or orally intubate where appropriate
- Maintain oxygenation via stoma and nose and mouth with a facemask
- Use tracheal dilator and attempt to re-insert tube
- Reposition patients neck and attempt to re-insert tube
- Consider using a smaller size tube

References

1. EEC Directive (1993) Class IIA, Rule 7. Council directive concerning medical devices, 93/42 EEC
2. Intensive Care Society (2008) Standards for the care of adult patients with a temporary tracheostomy

11.0 Weaning

The multi-disciplinary team (MDT) should be involved throughout the process of initiating weaning through to decannulation. If the patient has a neurological condition, a referral to a speech and language therapist should be made.

Criteria to commence weaning:

- The patient is able to maintain adequate gas exchange self-ventilating +/- supplemental oxygen. Occasionally patients may require non invasive ventilation (NIV) post decannulation for the management of chronic conditions such as obstructive sleep apnoea (OSA) or chronic obstructive pulmonary disease (COPD)
- There are no signs of deteriorating bronchopulmonary infection or excessive pulmonary secretions
- The patient has a stable lung status with oxygen therapy less than 40%[1]
- The initial reason for the insertion of the tracheostomy has been resolved and/or been considered (e.g. upper airway obstruction, cranial nerve palsy) [2,3]
- The patient is cardiovascularly stable

Stages of weaning

11.1 Cuff Deflation

The cuff provides some protection from aspiration and the presence of the inflated cuff means that the patient becomes unaccustomed to managing their own secretions and swallowing. Before cuff deflation, warn the patient about the possibility of a change in airway sensation and that they may cough.

Using a synchronised suction/cuff deflation technique deflate the cuff slowly. If the patient does have difficultly with continuous coughing that does not resolve with time and reassurance and/or signs of aspiration, re-inflate the cuff and check the cuff pressure using a cuff manometer.

Fig 11-1: A Cuff Manometer is used to measure the air pressure inside the cuff.

Persistent coughing may be due to difficulties managing oral secretions due to poor swallow and/or excessive secretions with a poor cough. With the former, a referral to the speech and language therapist would be appropriate.

Throughout the cuff deflation process, monitor the patient for any signs of respiratory distress (e.g. increase in respiratory rate, heart rate, work of breathing). The time a patient spends with the cuff deflated can be increased intermittently as tolerated. The ultimate aim is to build up cuff deflation for >24 hour period and can be continued overnight[4].

11.2 Gloved finger occlusion

If the patient is tolerating cuff deflation, adequate airflow around the tracheostomy tube and up into the mouth/nose needs to be established before weaning can progress any further. This is carried out by occluding the tracheostomy tube with a gloved finger and feeling for air flow from the nose/mouth. During occlusion, the patient must be monitored closely for any signs of respiratory distress, if this occurs the procedure must be stopped. Good airflow can be confirmed by auscultating over the neck above the level of the tracheostomy tube
The presence of stridor, minimal or absent breath sounds above the level of the tracheostomy tube indicates reduced airflow around the tube. Therefore, changing the tube to a smaller size and/or fenestrated tube should be considered to optimise and proceed with weaning.

11.3 One-way speaking valve

If there is adequate airflow past the tracheostomy tube, place a one-way speaking valve over the tube opening, **ensuring that the cuff is deflated**. The one-way speaking valve covers the opening of the tracheostomy tube allowing air in through the valve on inspiration, but closes on expiration, allowing air past the vocal cords and out through the nose and mouth.

The patient may be able to vocalise with the one-way valve in place. Encourage vocalisation and monitor signs of difficulty managing oral secretions (e.g. wet sounding voice, difficulty clearing throat of secretions).

The length of time a patient is able to tolerate a speaking valve will vary from patient to patient and can only be gauged from observing the patient's work of breathing. For example, a patient who has a neurological deficit presenting with swallowing difficulties may only manage a period of 2-3 minutes initially. However, a patient who has no increase in work of breathing, adequate cough and swallow may tolerate several hours on an initial trial.

With the speaking valve on, the patient is exhaling past the tracheostomy tube and through the mouth/nose. This may place a greater demand on the patient's ventilatory reserve and the patient needs to be monitored closely for signs of respiratory distress or fatigue, which if present the trial should be stopped and the patient observed for resolution of these symptoms. The aim is to build up tolerance of using the one-way valve for more than four hours in one block, however it is not advisable to leave on overnight as secretions or sleeping position may occlude the one way valve. This process can be built up intermittently and the time increased as tolerated by the patient. It is advisable to remove the speaking valve during periods of nebulisation as the additional moisture or drugs can cause the one way valve to stick.

11.4 Decannulation cap

Once the patient is tolerating an extended period of cuff deflation and at least four hours at one time with a speaking valve in situ, a trial with the decannulation cap can be considered. This is the final stage of the weaning process and the tracheostomy tube is effectively blocked off. All the air via inspiration and expiration will be directed through the nose and mouth. **The cuff must always be deflated**, otherwise, the patient will be unable to breathe

in or out. The aim is to build up to four hours with the decannulation cap on. This may vary with patients who have undergone head/neck surgery or who have required a tracheostomy to resolve airway obstruction where the medical staff may request a longer period of time with the deacannulation cap in place before considering decannulation. During trials with a decannulation cap the patient must be monitored for signs of respiratory fatigue or distress which if present the trial should be stopped and the patient observed for resolution of these symptoms.

11.5 Troubleshooting

Problem	Cause	Solution
On cuff deflation, no or poor airflow past tracheostomy into mouth/ nose when using the gloved finger occlusion technique	Reduced space around the tracheostomy as tube too large or airway obstruction (e.g. stenosis, granulation tissue)	Consider changing the tube to a smaller tracheostomy tube +/_ fenestrated tube Consider referral to ENT to investigate airway obstruction prior to proceeding with weaning
An increase in work of breathing when one-way valve or decannulation cap in place	Cuff remains inflated	Remove one-way valve/ decannulation cap and deflate cuff. Continue weaning with a one way valve, once the patient symptoms have resolved.
	Reduced space around tracheostomy tube as too large or airway obstruction present	Consider changing the tube to a smaller tracheostomy tube +/_ fenestrated tube or referral to ENT to investigate airway obstruction prior to proceeding with weaning
	Poor ventilatory reserve	Build up time gradually, monitoring work of breathing
	Excessive secretions and/or difficulty swallowing	Encourage patient to cough and clear into mouth or swallow. Remove speaking valve and suction if necessary. If swallow is impaired, refer to Speech and Language Therapy
	Anxiety	Reassure and explain procedure fully to patient

11.6 Documentation

All stages of tracheostomy weaning must be clearly documented on the weaning sheet in the tracheostomy documentation pack, which can be found in Appendix 4.

11.7 Use of fenestrated tubes

A fenestrated tracheostomy tube is a tube with one or more small holes (fenestrations) on the upper surface of the tube which allow for greater airflow through the tube into the mouth and nose and can be useful for patients who are more difficult to wean or where reducing the size of the tube may be undesirable.

The weaning and decannulation process essentially remains the same. However it is important to make sure that a fenestrated inner cannula is used during weaning, but is replaced with a non fenestrated inner cannula for suctioning or if ventilation is required.

References

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2. Braine M; Sweby C (2006). A systematic approach to weaning and decannulation of tracheostomy tubes. British Journal of Neuroscience Nursing, vol. 2, no. 3, pages 124 – 132.
3. Kent, C (2005). Tracheostomy decannulation. Respiratory Care, vol. 50, no. 4, pages 538-541
4. Thompson-Ward E, Boots R, Frisby J, Bassett L ; Timm M (1999). Evaulating suitability for tracheostomy decannulation. A Critical evaluation of two management protocols. Arch Phy Med Rehab; 80: 1101–1105.

12.0 Decannulation

Decannulation can take place following successful weaning and with MDT agreement. This procedure should be undertaken or supervised by a practitioner who has the appropriate competence to recannulate should this be required. A recent study[1] identified that clinicians (physicians and respiratory therapists) rated level of consciousness, strong cough, minimal thin secretions and minimal supplemental oxygen as determinants of decannulation.

12.1 Suggested criteria for decannulation

- Able to obey commands (In the non neurologically compromised patient)
- Adequate cough and ability to clear secretions effectively and independently
- Cardiovascularly stable
- No new lung infiltrates on x-ray
- Tolerates cuff deflation for 24 hours
- Tolerates speaking valve 12 hours or more (usually during daytime) or decannulation cap for up to four hours (If air flow is present on finger occlusion). In patients following head and neck surgery, the decannulation cap may be left for longer periods at the discretion of the surgeon
- MDT agreement for decannulation

12.2 Equipment:

- Dressing pack
- Gauze and two transparent semi-permeable dressings such as tegaderm™ or opsite™
- Sterile normal saline
- Gloves, apron and protective eye wear
- Appropriately sized tracheostomy tube and one a size smaller (available not opened)
- Facemask or nasal specs if patient requiring oxygen
- Microbiological swab
- Tracheal dilators
- Functioning suction unit and appropriate sized suction catheters
- Stethoscope
- Resuscitation equipment

12.3 Procedure:

- Check emergency equipment
- Explain procedure to patient and gain patient consent where possible
- Position patient in semi-recumbent position
- When required place supplemental oxygen over nose and mouth
- Ensure assistant is clear regarding what is expected of them
- If required, ask assistant to suction, remove old dressing and tapes and support the tube
- Remove tube on expiration
- Observe site, swab if required and clean stoma
- Check patient is comfortable

- Use a portion of gauze folded in four and place over stoma, ask assistant to place clear dressings in place overlapping them over the stoma site
- Show patient how to apply pressure over the stoma site when talking or coughing to reduce 'blowout' of the dressing
- Document the procedure in the case notes and make a final check of the patient

Patients fail decannulation for a number of reasons; therefore the patient requires close observation post decannulation. Reasons for failure include increased work of breathing, inability to clear secretions and damage to the trachea including stenosis, tracheomalacia and granuloma that may have previously been undiagnosed. Clinical indications of these latter complications include stridor, change in voice quality and/or an increase in work of breathing.[2] A patient should be referred to the ENT team if concerned or the emergency team if acute respiratory distress is observed.

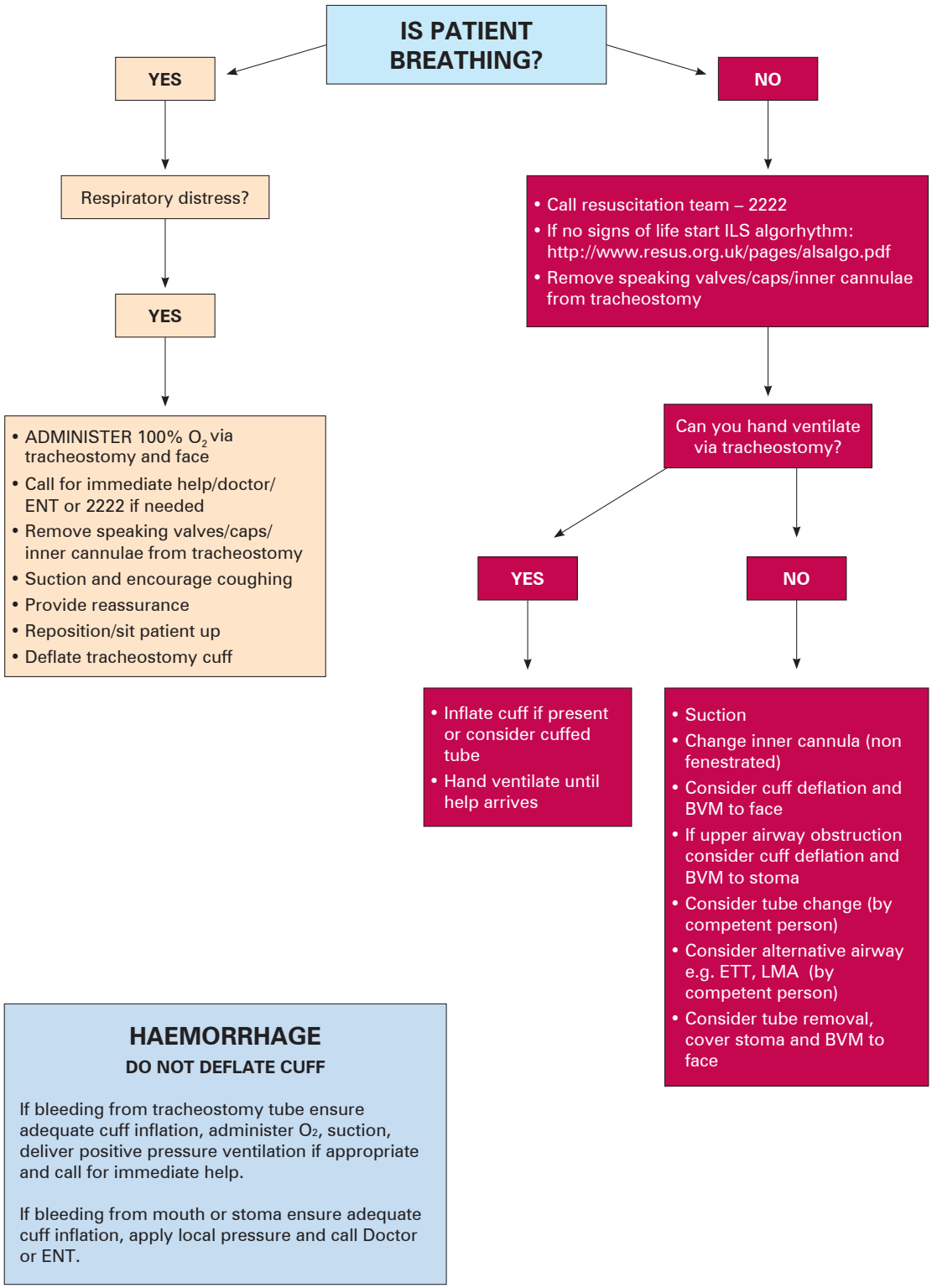
It is suggested that the emergency tracheostomy bag is kept by the patients bedside for 24 hours post decannulation in case of emergency.

References

1. Stelfox HT, Crimi C, Berra L, Noto A, Schmidt U, Bigatello LM, Hess D (2008) Determinants of tracheostomy decannulation: an international survey Critical care 12:R26.
2. Norwood S; Vallina V; Short K; Saigusa M; Fernandez L ; McLarty J (2000). Incidence of tracheal stenosis and other late complications after percutaneous tracheostomy. Annals of Surgery, vol. 232, no. 2, pages 233 – 241.

13.0 Emergency Scenarios

Fig 13-1 Tracheostomy Emergency Algorithm chart



14.0 Documentation

The tracheostomy ICP (see Appendix 4) is to be used for all adult patients with a tracheostomy whilst an inpatient at St Georges Hospital (this should be used in conjunction with the early warning score (EWS)) Documentation must be kept in the patient's bedside folder and updated on each shift. When complete this must be filed in the patients notes. The ICP includes the following sections:

- Record of tracheostomy tube insertion and changes
- Tracheostomy care record
- Tracheostomy equipment checklist
- Tracheostomy weaning plan
- Tracheostomy MDT continuation sheet

Additional documentation such as surgical interventions, limitations on treatment, tracheostomy changes, Speech and Language (SLT) advice, should be clearly documented in the patients' medical notes.

15.0 Discharge Home with a Tracheostomy

Tracheostomy discharge planning documentation should be used to guide a plan for discharge (see Appendix 5). For safe discharge, it is important to educate the following people while the patient remains an inpatient, on the principles of tracheostomy management to ensure safe discharge home from hospital:

- The patient
- The patient's relatives/next of kin/carers
- The district/community nursing team

For patients living in the London area, the London Ambulance Service (LAS) must be notified that a patient with a tracheostomy or laryngectomy is living in the community. In the event of an emergency, the LAS will be aware that if answering a 999 call on a patient's telephone number (home land line) and no-one speaks, that this is an emergency and they will send an ambulance and police immediately. An example of the LAS notification letter can be found in the tracheostomy discharge protocol. For patients living in other parts of the country, similar arrangements can be made with their local ambulance service.

Follow up arrangements for ongoing support and tube changes must be made prior to discharge for patients going home with a tracheostomy. Patients should be offered a follow up appointment in a suitable clinic (ENT or tracheostomy clinic) to be seen in the first 2 weeks post-discharge.

Appendix 1

Basic Competencies

St George's Healthcare NHS Trust

Basic Care of the patient with a Tracheostomy

Competency Statement/Skill	Formative Assessment 1		Formative Assessment 2		Summative Assessment	
	Level	Sign & Date	Level	Sign & Date	Level	Sign & Date
Demonstrate knowledge of anatomy and physiology of the respiratory tract						
Demonstrate knowledge of the indications for tracheostomy and type of tracheotomy performed						
Demonstrate knowledge of the complications of tracheostomy						
Identify different types of tracheostomy tubes and associated equipment and provide rationale for use						
Can identify the bed side equipment that should be present and explain its use						
Can select appropriate suction catheters						
Demonstrates how and when to clean inner tube						
Identifies the date of insertion and knows when due for replacement						
Perform an assessment of the patient with a tracheostomy showing the size of the tube, the cuff pressure, the presence or absence of a cuff leak and the condition of the site. Discuss the relevance of these findings for patient safety and comfort.						
Safely and competently change a tracheostomy dressing and tapes, showing awareness of patient comfort. Document the findings from stoma care.						
Discuss the indications for suctioning and demonstrates safe , competent technique						
Identify and discuss emergency situations						

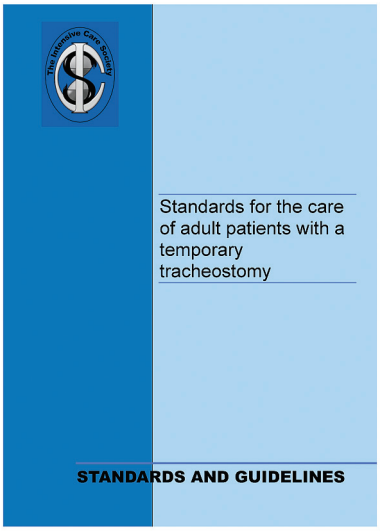
Appendix 2

Intensive Care Society Standards of Clinical Practice Adult Patients with a Temporary Tracheostomy

St George's Healthcare NHS Trust

The Intensive Care Society have issued an excellent set of "Standards and Guidelines" that apply to the care of adult patients fitted with temporary tracheostomies.

- These Care Standards should be required reading for all those involved in the care or treatment of tracheostomised patients.
- Rather than reproduce them here, we refer you to the ICS website, where you can be certain of obtaining the most up-to-date edition. Please visit http://www.ics.ac.uk



Extract:

"... At the same time, pressure on intensive care beds and a desire to use resources effectively has encouraged earlier discharge to intermediate and ward care. The very effectiveness of tracheostomy in accelerating weaning from mechanical ventilation and discharge from level 3 care often results in patients with temporary tracheostomies being cared for in multiple locations throughout an organisation. This creates a risk that they are cared for separately from the clinical services that are best placed to identify and treat the potentially life threatening complications associated with a temporary tracheostomy. It is therefore very important that there is clear documentation and communication, together with explicit responsibility and training for the healthcare staff involved... "

Appendix 3

Advanced Tracheostomy Competencies

St George's Healthcare NHS Trust

ADVANCED TRACHEOSTOMY COMPETENCIES

As part of the competency assessment the following criteria must be passed.

THEORY COMPONENT OF TRACHEOSTOMY COMPETENCIES

CRITERIA	OBJECTIVE	DATE ACHIEVED	ASSESSED BY

Tracheostomy weaning	• Can accurately identify when a patient is ready to wean
	• Accurately identifies the processes of:
	  • Cuff deflation
	  • Speaking valve
	  • Decannulation cap
	• Can accurately state correct documentation		

Tracheostomy change	• Can accurately state indications for tracheostomy changes • Can accurately gather equipment for tracheostomy change • Identifies personnel required to assist/support during change • Can accurately state exceptions to tracheostomy change procedure • Can accurately state correct documentation		
Tracheostomy complications	• Can state what procedures should occur if the following occur: - Tube inserted incorrectly - Tube cannot be re-inserted - Excessive bleeding - Airway collapse - Excessive coughing		
Decannulation	• Can accurately state standards for decannulation • Can accurately gather equipment for decannulation • Identifies personnel required to assist/support during change • Can accurately state exceptions to decannulation procedure • Can accurately state correct documentation		

Decannulation complications	• Can state what procedures should occur if the patient exhibits: - Airway collapse - Ineffective cough - Exhaustion - Aspiration - Panic/ distress		
Basic Life Support	• Able to accurately discuss procedure for performing BLS on a tracheostomy patient		
Tracheostomy tubes	• Can accurately state rationale for: - Non-fenestrated tubes - Fenestrated tubes - Inner tube		

PRACTICAL COMPONENT OF TRACHEOSTOMY COMPETENCIES

DECANNULATION ASSESSMENT DATE ↓	OBSERVED BY	COMPETENT Y / N	COMMENTS ABOUT PERFORMANCE
1. MANDATORY			
2. MANDATORY			
3. MANDATORY			
4. OPTIONAL			
5. OPTIONAL			
TRACHEOSTOMY CHANGE **ASSESSMENT DATE ↓**	**OBSERVED BY**	**COMPETENT** **Y / N**	**COMMENTS ABOUT PERFORMANCE**
1. MANDATORY			

2. MANDATORY			
3. MANDATORY			
4. MANDATORY			
5. MANDATORY			

Appendix 4

Integrated Care Pathway for Patients with a Tracheostomy

St George's Healthcare NHS Trust

St George's Healthcare NHS
NHS Trust

Integrated Care Pathway
for
Patients with a Tracheostomy

Name…… **Hospital number**……..

Date of birth …….. **Consultant** ……

First Tracheostomy			
Type & Size:	Date inserted:	Fenestrated yes/no	Cuff yes/no

Reason for tracheostomy / type of tube

Percutaneous / surgical

Any complications on insertion?

Date sutures removed…….

Tracheostomy tube changes			
Type & Size:	Date inserted:	Fenestrated yes/no	Cuff yes/no
Type & Size:	Date inserted:	Fenestrated yes/no	Cuff yes/no
Type & Size:	Date inserted:	Fenestrated yes/no	Cuff yes/no
Type & Size:	Date inserted:	Fenestrated yes/no	Cuff yes/no
Type & Size:	Date inserted:	Fenestrated yes/no	Cuff yes/no

Date of decannulation …….

Version 30th June 2008

Integrated Care Pathway
for
Patients with a Tracheostomy

This document should include:

- A front sheet (overleaf)
- Tracheostomy equipment check / tracheostomy shift care record sheets
- Tracheostomy weaning charts
- Multi-disciplinary team record sheets

Additional sheets should be added as appropriate.

On the patient's discharge from the hospital, this document should be filed in the medical notes.

If the patient is to be transferred to another hospital with the tracheostomy in place, please send with the patient –

- A photocopy of the front sheet
- Photocopies of the MDT record sheets
- A photocopy of the most recent equipment check / shift care record sheets.

Name ..... Number .....

Tracheostomy equipment check: to be completed on EVERY shift

Date									**You must also complete the Tracheostomy Care Record (see over)**
Time									
Non-re-breathe circuit (green bag)									
Adult BVM (Bag Valve Mask) with reservoir and tubing									
Oxygen flow meter (check function)									
Suction unit (set to – 20kPa on open suction)									
Suction catheters (Size of trache -2) x2									
Yankauer sucker									
Flush for tubing									
Emergency bag: Spare trache tubes *(Same type. 1 same size & 1 one size smaller)*									
Emergency bag: Tracheal dilators									
Emergency bag: Tracheostomy disconnection wedge									
Emergency bag: 10ml syringe									
Emergency bag: Stitch cutter									
Emergency bag: Aquagel									
Gloves									
Aprons									
Protective eye wear									
Signature									

Name …….. Number ……..

Tracheostomy Care Record

To be completed ON EVERY SHIFT

Date and time								
Start of shift	**Start of shift**	**Start of shift**	**Start of shift**	**Start of shift**	**Start of shift**	**Start of shift**	**Start of shift**	**Start of shift**
Tracheostomy equipment checklist completed **(see over)** *(Yes / No)*								
Cuff pressure = *(Should be* 25-34 cmH_2O. *If not, alert MDT to query cuff leak)*								
FiO2 required *(state percentage)*								
Humidification device in use? *(state which)*								
How often should respiratory obs be done?								
Is regular suction required? *(frequency or 'as required')*								

End of shift	**End of shift**	**End of shift**	**End of shift**	**End of shift**	**End of shift**	**End of shift**	**End of shift**	**End of shift**
Inner cannula inspected & cleaned at least four hourly? *(Yes / No)*								
How often was suction performed? *(e.g. 1-2 hourly, etc)*								
Quantity of secretions *(e.g. minimal, moderate or copious)*								
Colour (*describe e.g. clear, purulent, blood stained)*								
Specimen sent? *(Yes / No)*								
Stoma condition *(describe e.g healthy, inflamed, oozing, sputum leak)*								
Wound swab sent? *(Yes / No)*								
Dressing changed? *(If more than once, state how often)*								
Variances *(If routine care is not carried out, please state the reason clearly)*								
Signature								

ST. GEORGE'S HEALTHCARE -**OBSERVATION CHART FOR TRACHEOSTOMY-WEANING** **SHEET No. _____**

Surname _____ D.O.B/ or Hospital No. _____ Physio Name + Bleep No. _____

Forename _____ Ward _____

Please consult MDT before proceeding with weaning if a patient has a neurological disorder.

Please ensure patient is in an upright position and before commencing weaning suction trachea and oropharynx.

Please circle/tick as appropriate	Date Time Initials	Date Time Initials	Date Time Initials
1. Cuff Deflated +/- synchronous suction (ss)	Yes/No If 'Yes' - go to step 2 **If 'No' –stop. Do not proceed further**	Yes/No If 'Yes' - go to step 2 **If 'No' –stop. Do not proceed further**	Yes/No If 'Yes' - go to step 2 **If 'No' –stop. Do not proceed further**
2. With finger occlusion – is there air flow through the mouth?	Yes / No If 'Yes' go to step 3 If 'No' there may be an obstruction – do not proceed further. Discuss with Trache team/ENT/ Anaesthetist to consider downsizing trache tube	Yes / No If 'Yes' go to step 3 If 'No' there may be an obstruction – do not proceed further. Discuss with Trache team/ENT/ Anaesthetist to consider downsizing trache tube	Yes / No If 'Yes' go to step 3 If 'No' there may be an obstruction – do not proceed further. Discuss with Trache team/ENT/ Anaesthetist to consider downsizing trache tube
3. Is fenestrated trache in situ ?	Yes/No If 'Yes' place fenestrated inner cannulae in (unless suctioning)	Yes/No If 'Yes' place fenestrated inner cannulae in (unless suctioning)	Yes/No If 'Yes' place fenestrated inner cannulae in (unless suctioning)
4. Put on speaking valve or cap	speaking valve / cap / neither	speaking valve / cap / neither	speaking valve / cap / neither
5. **Planned** length of time for:	Cuff down _____ Speaking valve _____ Cap _____	Cuff down _____ Speaking valve _____ Cap _____	Cuff down _____ Speaking valve _____ Cap _____
6. **Actual** length of time managed for point 5.	Hours _____ Minutes _____	Hours _____ Minutes _____	Hours _____ Minutes _____
7. If planned time not equal to actual time – Why not? (e.g.increased work of breathing excessive secretions, fatigue)	Comments:	Comments:	Comments:
8. Suggested progression			

Tracheostomy ICP – Multi-Disciplinary Team notes

Date and time		Signature / print name Discipline / grade

Appendix 5

Guidelines for Care and Training Patients Going Home with a Tracheostomy

St George's Healthcare NHS Trust

Patient Name_____ Hospital Number _____

St George's Healthcare NHS
NHS Trust

Patients Going Home with a Tracheostomy

Guidelines for Care and Training required prior to Discharge from Hospital

Patients going home with a tracheostomy tube have limited support in the community. Therefore, they or their carers must be trained on the ward to feel confident in the day-to-day care and management of their tracheostomy tube. Planning their discharge is a complex process, involving close liaison with the patient's community team and ensuring the right specialist equipment is provided for the patient. Therefore, this process should be started as soon as possible.

This document lays out the core skills required by the patient or carer prior to discharge from hospital. It also lists the essential equipment which must be ordered for the patient. This is to ensure as safe a discharge as possible from hospital.

A ward nurse should be assigned to the duty of ensuring the guidelines are carried out and signed off when the patient or carer feels confident. Also, the assigned nurse will be responsible for ordering and collating the essential tracheostomy equipment before the patient is discharged. Referral to the District Nursing service should be made as early as possible, as some of the equipment will need to be ordered from the District Nurse, and the District Nurse may require training.

Where appropriate, the patient should be given an appointment to attend the Speech and Language Therapy/ ENT Nurse Led tracheostomy clinic (PAS code TRACSLTI) within two weeks of their discharge from hospital.

Contents of Pack:

1. Skills required by the patient and /or carer prior to discharge from hospital
    - These skills should be signed off, and filed in the patient's medical notes. A copy should be given to the patient and their District Nurse.

2. List of essential tracheostomy equipment required for home and where this can be ordered from.

3. Pictures of tracheostomy anatomy – to be used with the patient / carer for education purposes and given to the patient to keep

4. Tracheostomy Emergency Guidelines – to be covered with the patient/ carer and given to the patient to keep at home.

5. London Ambulance Service letter – to be filled in and faxed to LAS by the assigned ward nurse. Copy to be kept in medical notes.

Patient Name_____ Hospital Number _____

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TRACHEOSTOMY SKILLS REQUIRED BEFORE DISCHARGE FROM HOSPITAL	Patient demonstrates confidence - sign	D/Nurse demonstrates confidence - sign	Comments / Variance
ANATOMY&PHYSIOLOGY • Patient/carer demonstrates understanding of basic knowledge of altered post-surgical neck anatomy *(use enclosed pictures)* • Patient/carer demonstrates understanding of structure of tracheostomy stoma site • Patient/carer can identify the type and parts of the tube they possess			
STOMA CARE • Patient/carer demonstrates understanding of the importance of stoma cleaning and frequency *(daily)* • Patient/carer able to state possible signs of infection at stoma site • Patient/carer demonstrates effective cleaning of stoma			
TUBE CARE • Patient/carer demonstrates understanding of the importance of inner tube cleaning and frequency • Patient demonstrates ability to remove inner cannulae, clean it and then re-site it			
DRESSING CARE • Patient/carer demonstrates an understanding of the importance of dressing care and frequency of changes *(at least daily)* • Patient/carer demonstrates how to change tracheostomy dressing			
TRACHEOSTOMY VELCRO HOLDER CARE •Patient and carer demonstrates how to change tracheostomy holder and adjust fit *(at least weekly)*			

Patient Name_____ Hospital Number _____

SUCTIONING • Patient/carer demonstrates awareness of the indications of suction • Patient/carer demonstrates an awareness of oral and tracheal suction • Patient/carer demonstrates an awareness of the type of tracheostomy the patient has and the implications of suction • Patient/carer demonstrates an effective suction technique			
HUMIDIFICATION • Forms of humidification discussed and agreed with patient/carer on discharge • Patient/carer demonstrates awareness of the indication of using an appropriate HME e.g swedish nose, buchannon bib, humidified oxygen. • Patient/carer demonstrates understanding of when a nebuliser is required and how to clean the equipment			*Humidification Agreed:* - _____ _____ _
CUFF PRESSURE CHECK *(if applicable)* • Patient/carer demonstrates awareness and ability to check tracheostomy cuff pressure twice a day using a manometer			
EMERGENCY PROCEDURES • *Patient is aware of what constitutes a tracheostomy emergency* • *Patient indicates he knows what to do if the tracheostomy becomes blocked* • *Patient indicates he knows what to do if the tracheostomy becomes displaced* • *Patient confirms he has a telephone land line and consents to being added to the London Ambulance Service Neck Breathers register*			*Letter faxed to LAS*_____
FOLLOW-UP • *Date and time for follow up in tracheostomy clinic made*			*Date and time of Appointment* _____

Patient Name_____ Hospital Number _____

Essential Tracheostomy Equipment to be Obtained Prior to Discharge from Hospital

ALL patients should have the following equipment provided:

Item	Requirements	To be ordered from…	Procurement details	Arranged? (signed)
Suction Machine	Must be battery and mains operated	District Nurse	**Laerdal Medical Ltd.** Laerdal House, Goodmead Rd., Orpington Kent BR6 0HX 01689-876634	
Suction Catheters	Size to be calculated dependent on tube (x3/2)	District Nurse	NHS supplies Size 10 – FSQ302 Size 12 – FSQ303 Size 14 – FSQ304	
Yankeur mouth suction tubes	-	Ward	NHS supplies FWP501	
Tracheostomy Tubes	One same size and one size smaller	Ward	See attached index sheet for appropriate tube for patient	
Dilators	One	Ward	Obtain from CSSD	
Tracheostomy dressings	One box	Country wide medical	0800 783 1659	
Trache Holder	One box	Country wide medical	0800 783 1659	
Trache mask and Oxygen connector	Two	Ward	NHS Supplies Trache mask – FDD545 Oxygen tubing – FDF352	
Gloves	One box	District Nurse		
Stoma Filter	2 boxes	Country wide medical	0800 783 1659	
Shower Shield	One	Country wide medical	0800 783 1659	

Special equipment if appropriate					
Nebuliser chamber and tubing	One	District Nurse	NHS Supplies FDE074	Required for this Patient? Y/N	Ordered (signed)
Oxygen	Level of O2 requirement decided on discharge	District nurse		Required for this Patient? Y/N	Ordered (signed)
Manometer	Only if patient has cuffed Tracheostomy tube	Ward	NHS Supplies FDH345	Required for this Patient? Y/N	Ordered (signed)

Patient Name _____ Hospital Number_____

Index of Tracheostomy Tubes and order codes

This Patient Requires: (tick)	Type of tube	Manufacturer	Size	Manufacturer Code	Stock Code
	Blue Line Ultra® profile kit soft seal cuff	Portex®	6.0	100/800/060	FDG346
	Blue Line Ultra® profile kit soft seal cuff	Portex®	7.0	100/800/070	FDG347
	Blue Line Ultra® profile kit soft seal cuff	Portex®	8.0	100/800/080	FDG351
	Blue Line Ultra® profile kit soft seal cuff	Portex®	9.0	100/800/090	FDG353
	Inner Cannula for soft seal tube (non fenestrated)	Portex®	6.0	100/850/060	FDG280
	Inner Cannula for soft seal tube (non fenestrated)	Portex®	7.0	100/850/070	FDG341
	Inner Cannula for soft seal tube (non fenestrated)	Portex®	8.0	100/850/080	FDG284
	Inner Cannula for soft seal tube (non fenestrated)	Portex®	9.0	100/850/090	FDG297
	Uniperc™ adjustable flange with Soft-Seal®	Portex®	7.0	100/897/070	FDH295
	Uniperc™ adjustable flange with Soft-Seal®	Portex®	8.0	100/897/080	FDH297
	Uniperc™ adjustable flange with Soft-Seal®	Portex®	9.0	100/897/090	FDH298
	Uniperc™ Inner Cannulae	Portex®	7.0	100/890/070	FDG901
	Uniperc™ Inner Cannulae	Portex®	8.0	100/890/080	FDG902
	Uniperc™ Inner Cannulae	Portex®	9.0	100/890/090	FDG903
	Shiley Cuffless	Shiley™	6	6CFS	FDH044
	Shiley Cuffless	Shiley™	8	8CFS	FDH046
	Shiley low pressure cuff fenestrated	Shiley™	6	6FEN	FDH035
	Shiley low pressure cuff fenestrated	Shiley™	8	8FEN	FDH036
	Shiley uncuffed fenestrated	Shiley™	6	6CPN	FDH049
	Shiley uncuffed fenestrated	Shiley™	8	8CFN	FDH050

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Information for patients

Caring for your tracheostomy and what to do in an emergency

How do I care for my tracheostomy?

- Check the inner tube three times every day.
  - When you wake up,
  - in the middle of the day
  - before you go to bed.

  Clean it if you see any secretions (phlegm) inside. You may need to check and clean the inner tube more frequently if you are producing a lot of secretions.
- Always have a clean inner tube ready, to put in while you're cleaning the dirty one.
- Change the tracheostomy dressings at least once a day or more often if they become dirty.
- The Velcro holders securing the tracheostomy in place need changing at least once a week or more often if they become dirty. This is a two person job – one person to hold the tracheostomy tube in place and the other person to remove and replace the holder. For the first few times change them when your District Nurse is with you.
- Wear a Heat Moisture Exchanger (HME) also known as a Buchanan Bib over the tracheostomy tube all the time. This is especially important at night, to help keep the secretions loose.
- Make sure you have a way of attracting attention at night if you need help, for example have a bell by your bed or emergency pendant.

What should I do if the tracheostomy becomes blocked?

1. Remove the inner tube and replace with a clean one.
2. If you are still in difficulty, suction the tracheostomy tube.

Then **either**:

3a. If this relieves your symptoms, have a nebuliser immediately and arrange to come to hospital outpatients for a check-up.

Or

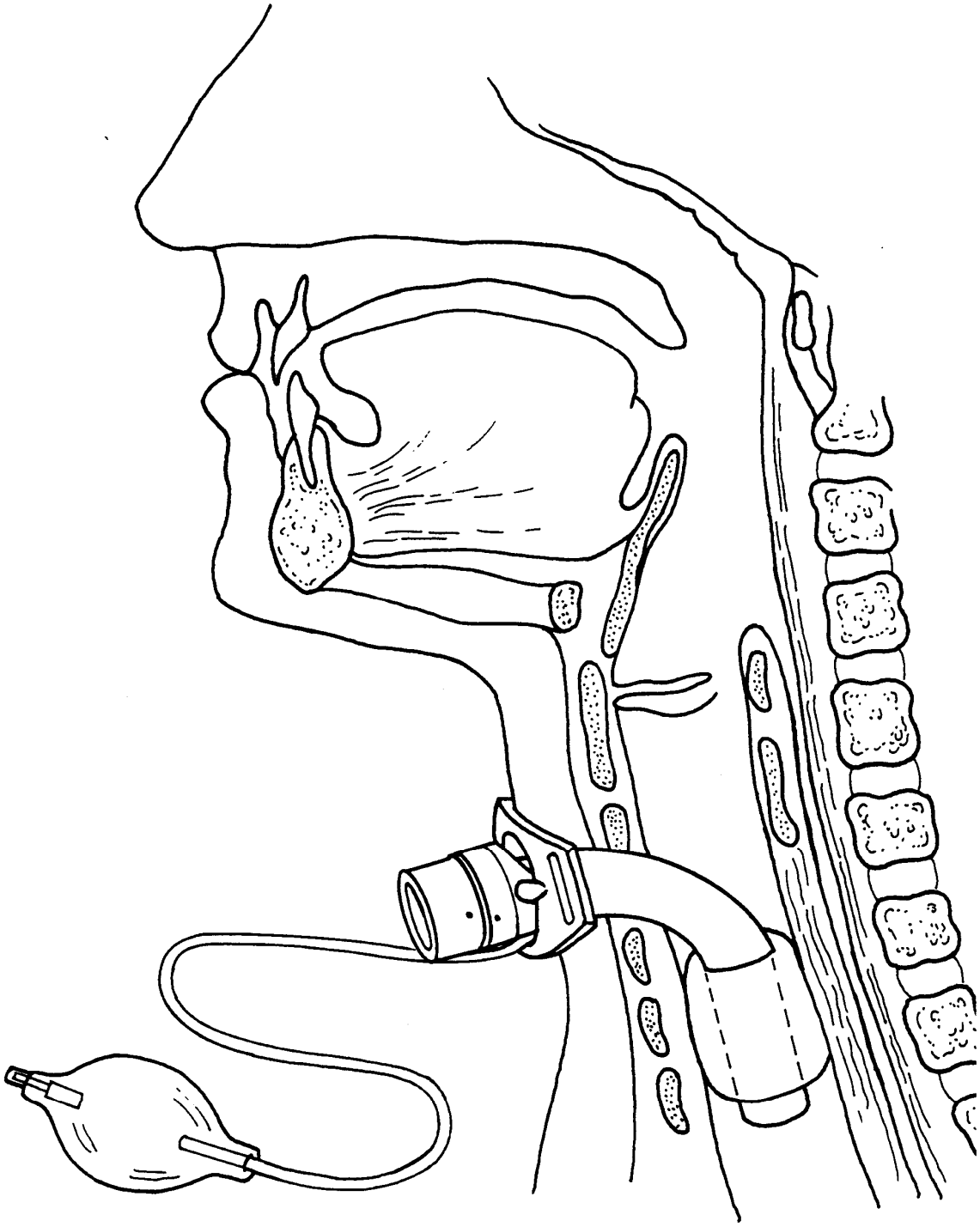
3b. If you are still in difficulty, call **999** immediately.

What should I do if the tracheostomy falls out?

1. Keep calm as you will still be able to breathe, but immediately:
2. Try to put the whole tube back into the hole. It goes in the same direction as when you put the inner tube into the outer one. Use some water based gel e.g. Aquagel or KY jelly, to make this easier.
3. If this is difficult, try to put the next size down tube in the hole.
4. If you can't do this, call 999 and use the tracheal dilators to hold the hole open.

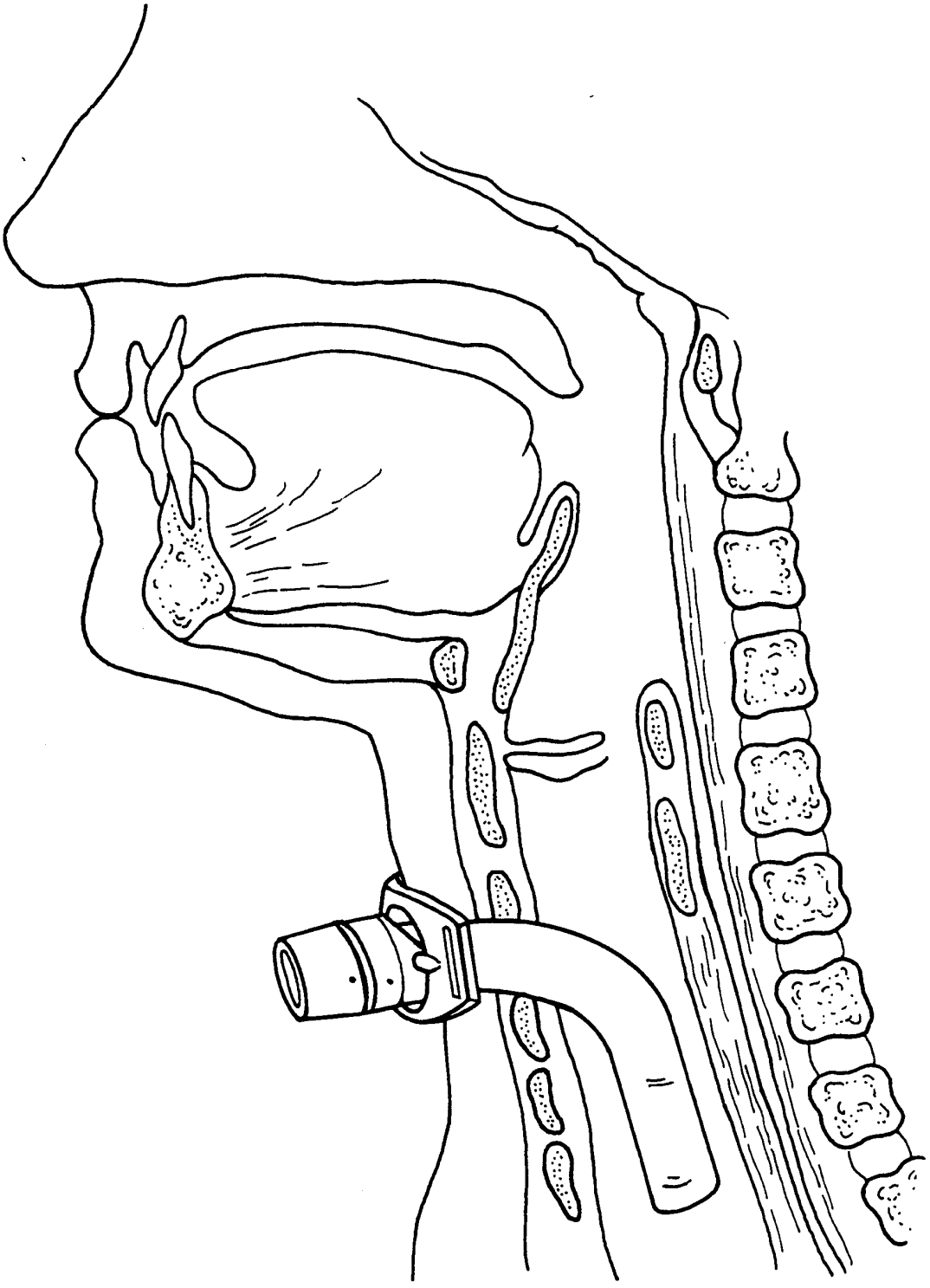
Patient Name_____ Hospital Number _____

Cuffed Tracheostomy Tube



Patient Name_____ Hospital Number _____

Cuffless Tracheostomy Tube



Patient Name_____ Hospital Number _____

St George's Healthcare NHS
NHS Trust

Florence Nightingale Ward
4th Floor, St James' Wing
Direct Line: 020 8725 3190

St George's Hospital
Blackshaw Road
London
SW17 0QT

www.st-georges.org.uk

Date:
Hospital Number:

Control Services Manager
London Ambulance Service NHS Trust
220 Waterloo Road
London SE1 8SD
Telephone: 0207 463 2527
Fax: 0207 921 5188

Dear

Re: New Tracheostomy Patient for Risk Register

Please find below the details of a new patient living at home with a tracheostomy to add to the register of neck breathers. If they contact the emergency services they may not be able to speak, and the ambulance crews attending the patient would need to be aware that resuscitation would be mouth to tracheostomy, not mouth to mouth.

Patient: **DOB:**

Address:

Phone:

Please contact me as soon as possible if there are any concerns regarding this.

Yours Sincerely

Discharge Co-ordinator

Cc Medical Notes

St George's Healthcare NHS Trust would like to make clear that it does not support any one particular company's product, but is very grateful for the support given in printing this document by Smiths Group PLC.

Order Code: TR194455GB-0112

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