Introduction
A Tracheostomy i.e. a surgical opening or stoma into the trachea below the larynx is undertaken either electively or as an emergency to either overcome upper airway obstruction, facilitate mechanical ventilatory support and/or the removal of tracheo-bronchial secretions. The stoma can be temporary or permanent and is usually kept patient by inserting a hollow plastic tube i.e. a tracheostomy tube. At St. James’s Hospital the treatment and care of all patients with a tracheostomy is planned and delivered in consultant with the patient by a specialist Multidisciplinary Team under the supervision of a named Consultant in accordance with current evidence-based best practice guidelines. While each patient’s care and treatment is planned and delivered in accordance with their individual needs and preferences, the standardised practices directed herein should be applied where possible in order to ensure the delivery of safe effective care that facilitates optimal outcomes for the patient and their family/carer

Aim:
To guide staff in the procedures that they should undertake when caring for a person with a tracheostomy in order to ensure the patient’s safety, minimise the occurrence of associated risks and assist in their recovery
Where required further information or advice relating to general tracheostomy care or the care of a specific person with a tracheostomy should always be sought from a suitably qualified professional i.e. the patient’s medical team and/or the Tracheostomy Safety Facilitator accessible at Bleep #538.

Tracheostomy Care Guidelines No: SJH:N(G):009 Version 4
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**Appendices and References**

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3.0 Definitions/ Glossary
- Tracheotomy: Incision made below the cricoid cartilage through the 2nd – 4th tracheal ring.
- Tracheostomy: The opening or stoma made by this incision.
- Tracheostomy Tube: Artificial airway inserted into the trachea during tracheotomy.

4.0 Indications / Rationale for Use
4.1 Acute upper airway obstruction
4.2 Chronic upper airway obstruction
4.3 To obtain and maintain a patent airway where compromised by injury or post head and neck surgery
4.4 To facilitate weaning from mechanical ventilation by decreasing anatomical dead-space
4.5 To prevent and /or treat retained tracheobronchial secretions
4.6 To reduce the risk of pulmonary aspiration

5.0 Associated Clinical Complications
5.1 Immediate:
- Haemorrhage
- Pneumothorax
- Accidental displacement of the tube

5.2 Intermediate:
- Tube occlusion by secretions and/or blood
- Infection i.e. chest/site – 50 to 60% of patients with tracheostomies may develop nonnosocomial pneumonia (Mapp 1988, Casting et all 1994)
- Cuff over/under inflation

5.3 Late:
- Tracheal ulceration
- Tracheo-oesophageal fistula
- Tracheo-cutaneous fistula
- Granulation tissue (skin/tracheal)
- Tracheal stenosis (at incision or cuff site)
- Scar formation

6.0 Insertion Techniques
6.1 Surgical Insertion

6.1.1 This is an ‘open’ technique that is performed in the operating theatre by Ear Nose and Throat, Oral and Maxillofacial or Cardiothoracic Surgeons (See Image 1.0)
6.1.2 The patient is positioned with the neck hyper-extended.
6.1.3 An incision is made in the neck over the second or third tracheal ring. The strap muscles, major blood vessels and thyroid are retracted as required. The thyroid isthmus is divided (not in all cases) and the tracheostomy tube is inserted (Engels et al. 2009; Sykes & Young 1999).
6.2 Percutaneous Insertion

6.2.1 This technique is used by consultants in intensive care to insert a tracheostomy into patients in the Intensive Care Unit.

6.2.2 The technique involves the insertion of a tracheostomy tube using a guide wire which is inserted into the trachea over a dilator which opens up the airway.

6.2.3 The tracheostomy tube is then inserted following appropriate dilation.

6.2.4 This method can be performed within a critical care unit rather than a theatre (Engels et al. 2009; Paw & Bodenham 2004).

6.2.5 This method has several advantages over the traditional method of performing tracheostomies and prolonged translaryngeal intubation.

6.2.6 It has several advantages over prolonged translaryngeal intubation.

6.2.7 The traditional method of performing tracheostomies in critically ill patients usually requires transport from the intensive care unit (ICU) to the operating department, where a surgical team performs an open or surgical tracheostomy.

6.2.8 This involves dissection of the pretracheal tissues and insertion of the tracheostomy tube into the trachea under direct vision.

6.2.9 For critically ill patients, bedside tracheostomy can also be performed by a percutaneous dilatational technique.

6.2.10 An advantage of bedside percutaneous dilatational tracheostomy is that it is easy to perform, more rapid and less expensive. This bedside dilatational tracheostomy procedure is widely accepted as a safe and cost effective alternative to formal surgical tracheostomy.

6.2.11 No surgical wound is made and the tracheostomy tube is inserted between the surrounding tissue reducing movements of the tube. An incision into the tracheal rings is not necessary and the rings remain theoretically intact. The parastomal infection rate is considerably lower than after conventional open tracheotomy (Friedman et al 1996, Freeman et al 2000, Rana et al. 2005).

6.2.11.1 Advantages of Percutaneous Dilatation Technique

- Simple technique suitable for trained medical staff in the critical care setting
- It is less disruptive for patient/ICU staff alike as it can be done at the bedside in ICU
- Reduces the inherent risks associated with the possible need to transfer a critically ill patient out of the unit
- Does not require operating theatre, therefore less expensive in terms of human and material resources
- Possibly less waiting time for patient.
- Early tracheostomy (percutaneous dilatational technique within 48hrs) associated with decreased ventilator associated pneumonia, decreased length of ICU stay, and decreased hospital mortality (Rumbak et al 2004, Engels et al. 2009)
- Associated with less peristomal bleeding

### 6.2.11.2 Contraindications to Percutaneous Dilatation Technique

Contraindications to percutaneous tracheotomy include the following:
- Age < 15 yrs
- Gross distortion of the neck due to haematoma, tumor, thyromegaly or scarring from previous neck surgery
- Un-correctable bleeding diathesis
- Obese, short or bull neck that obscures the anatomical landmarks in the neck
- Inability to extend the neck because of cervical fusion, rheumatoid arthritis, or other cervical spine instability (Kost 1999, Paw & Bodenham 2004).

See Appendix 1 directing the Percutaneous Tracheostomy Procedure and the nurse’s role in caring for the patient undergoing this procedure.

### 7.0 Tracheostomy Tubes

#### 7.1
All tracheostomy tubes used in St James’s Hospital are double lumen tubes i.e. they have both an outer and inner tube.

#### 7.2
All tubes must be routinely changed every 28 – 30 days in order to comply with EU Regulations (EU Directive 1993).

There are 2 brands of tubes used within the hospital: Shiley and Portex.

**Shiley Tube**
- Non-fenestrated
- Fenestrated
- Cuffed/Cuffless
- Sizes 10mm, 8mm, 6mm, 4mm

**XLT Extended Length Tube**
- Non fenestrated cuffed
- Available in Distal/Proximal
- Sizes 8mm, 6mm
Portex Blue Line Ultra Tube
- Non-fenestrated
- Cuffed
- Sizes 7mm, 8mm, 8.5mm, 9mm.
- (inner cannula size comparison chart see appendix 3)

Portex uni perc adjustable
- Non-fenestrated
- Cuffed
- Sizes 7mm, 8mm, 9mm.

7.3 Tracheostomy Tube Components

7.3.1 Outer tube: Licensed for up to 30 days use only (EU Directive 1993). Available in various lengths and sizes – extended length tube can be used for patients with difficult anatomy.

7.3.2 Inner tube: A removable, disposable tube that fits snugly into the outer cannula to ensure tube patency.

7.3.3 Flange: Flat plastic plate attached to outer tube which lies flush to the patients neck

7.3.4 15mm hub: Fits all ventilator and respiratory equipment (Shiley tubes must have inner cannula insitu)
Optional Features:

7.3.5 Cuff: Inflatable air reservoir (high volume, low pressure). When inflated helps anchor the tube in place and provides an airtight seal which facilitates artificial ventilation. It may also help in reducing aspiration of oral secretions, vomit and blood from the upper airways - it will not completely prevent aspiration. To inflate, air is injected via the Inlet valve.

7.3.6 Inlet valve: One way valve that prevents spontaneous escape of injected air.

7.3.7 Inlet line: Route for air from air inlet valve to cuff.

7.3.8 Pilot Cuff: Serves as indicator of the amount of air in the cuff.

7.3.9 Fenestration: Hole situated on the curve in the middle of the upper aspect of the tube that is used to enhance the passage of air and secretions in and out of the trachea.

7.3.10 Speaking valve / Tracheostomy button or cap: Used to occlude the tracheostomy tube opening

8.0 Bedside Equipment Requirements

It is the responsibility of the nurse assigned to the patient’s care to ensure at the beginning of each shift that the equipment they need is readily accessible i.e. assembled at the bedside and functional. The equipment should include the following:

8.1 Sealed Shiley or Portex tracheostomy tray containing the following equipment: (Available on St John's ward or long store room in ICU)

- Spare Tracheostomy tubes (Same size and size smaller)
- Tracheal Dilators
- 10ml syringe
- Tracheostomy Tapes (Cotton and Velcro)
- Stitch Cutter
- Scissors
- KY Gel
- Sleek Tape
- Pen torch

Sealed tracheostomy tray.
8.2 **Humidification Equipment:** The equipment required depends on the humidification method being used. Refer to Section 12.0.

8.3 **Suctioning Equipment including the following:**
- Suction machine fitted with filter.
- Suction tubing.
- Suction catheters (see suctioning page for correct catheter sizes).
- Gloves (see below)
- Bottle of sterile water to rinse tubing – change daily.

8.4 **Gloves:** Non-sterile for general handling and sterile gloves for suctioning and inner cannula care.

8.5 **Infectious waste bag**

8.6 **Communication aide e.g.** Pen & Paper, magic writing board, alphabet chart etc.

8.7 **Spare inner cannula:** This must be the same type and size as the tube that is in place (See Images below)

Portex inner cannula/ Shiley inner cannula

8.8 **Tracheostomy over bed sign. This must be placed over the patient’s bed space (forms are stocked in ICU/St Johns ward and theatre) see Appendix 9.**
9.0 Inner Cannula, Stoma and Tracheostomy Tie Care

9.1 The objective in undertaking frequent through inner cannula care is as follows:
- To help maintain a patent airway
- To prevent infection
- To maintain skin integrity
- To help prevent tube displacement

9.2 Frequency of Cleaning
- Inner cannula must be checked at least every 4hrs or more frequently if indicated - see below
- Stoma site must be checked at least daily or when attending cannula. Site must be kept clean and dry
- Ties: Check as required in order to ensure they are clean and dry

9.3 Checking Inner Cannula Procedure
The Nurse undertaking the cannula must:
9.3.1 Perform hand hygiene.
9.3.2 Wear non-sterile gloves
9.3.3 Remove inner cannula
9.3.4 If clean, reinsert and lock into place
9.3.5 If soiled – discard disposable inner cannula and reinsert new one. (video clips available on the SJH Learning hub: to access see Appendix 11)

9.4 Stoma Care
9.4.1 The nurse must undertake care of the stoma site at least once a day or more frequently as required to reduce the risk of skin irritation and peri-stomal infection.
9.4.2 Tracheostomy ties should be changed when wet or soiled and routinely at least once a week.
9.4.3 Tracheostomy tubes sutured in place require daily cleaning with NACL
9.4.4 Tracheostomy sutures should be removed 7 days post insertion
9.4.5 In the event the patient has a neck flap the nurse must consult the plastics team prior to removal and fitting of velco/cotton ties.

9.4.6 Equipment required
- Dressing trolley & pack
- Pair of sterile gloves
- Unsterile gloves
- Normal saline solution
- Scissors
- +/- foam dressing
- New tracheostomy ties
- Suction equipment
- Infectious waste bag

9.4.7 Stoma Cleaning Procedure
The Nurse undertaking stoma care must:
9.4.7.1 Perform hand hygiene
9.4.7.2 Wear non-sterile gloves
9.4.7.3 Remove and dispose of any soiled dressings
9.4.7.4 Using aseptic technique, clean the stoma site using gauze and normal saline
9.4.7.5 Pat dry and apply keyhole dressing if necessary.
9.4.8 In the event the patient’s skin is excoriated the nurse should apply a skin barrier cream i.e. soft paraffin or cavilon (Serra 2000, Troke, C. 2002)

9.4.9 In the event the tracheostomy ties require changing i.e. wet, soiled or routine, the nurse must have a second nurse hold the tracheostomy tube securely in place, while removing and replacing tracheostomy ties, leaving 1 finger space between ties and patient’s neck.

9.4.10 It is advised to use both Velcro and cotton ties for all ventilated patients in the ICU setting.

9.4.11 Cotton ties must be used for any patient who is at risk of dislodging tube i.e. confused and agitated patients or any patient with an anatomically difficult neck and whose airway would be severely compromised if the tube dislodged.

9.4.12 Otherwise the use of Velcro ties are advocated and are less inclined to cause skin maceration to the neck (Dennis-Rouse & Davidson 2008)

9.4.13 **Securing Tracheostomy Ties**

**Velcro Ties.**
The nurse must
- Thread the Velcro tabs of both sections of ties through eyelets in tracheostomy tube and then back onto ties.
- Bring longer piece (B) around neck and underneath section (A).
- Leave 1 finger space between ties and patient’s neck.

**Cotton Ties**
The nurse must
- Bring one long end around the neck and tie to short end in single knot.
- Repeat on the other side ensuring that 1 finger space is remaining between the ties.
- and the patient’s neck.
- Where the use of cotton ties is indicated (See 9.4.11) it is advised that they are used in conjunction with velcro ties. The cotton ties should be placed over the Velcro to protect the skin from neck maceration.

(video clips available on the SJH Learning hub: to access see Appendix 11)

10.0 **Flange & Stay Suture Care**

10.1 Most surgically inserted tracheostomy tubes and occasionally percutaneous tubes are secured in position with **silk sutures**

10.2 These sutures should be removed at the time of the first tube change or at the time of decannulation i.e. approximately 5 - 7 days post insertion.
10.3 The nurse must continue to observe suture sites for signs of infection and treat accordingly.

10.4 Stay sutures or ‘rescue’ sutures are left in position until the patient’s 1st tube change or approximately 10 days post insertion where the tube is changed at a later date.

10.5 These sutures can be used to ‘lift’ the trachea nearer to the surface and keep the stoma open if accidental tube dislodgement occurs.

11.0 Suctioning via a Tracheostomy Tube

11.1 Suctioning to removing endotracheal secretions must be undertaken in order to maintain a patent airway.

11.2 Suctioning must be undertaken only as needed i.e. where there is evidence of pulmonary secretions.

11.3 Suctioning must not be undertaken to a pre-set schedule.

11.4 More frequent suctioning may be required in the immediate post-operative period.

11.5 Selecting appropriate catheter size.

11.5.1 The nurse must select a suction catheter appropriate to the tube size in order to ensure the suction catheter is \( \leq \frac{1}{2} \) the internal diameter of tracheostomy tube.

11.5.2 This should be identified by using either of the following formula:

- Multiplying the tracheostomy tube size by three and dividing the total by 2 e.g. with a size 8 tube the calculated suction catheter is \( 8 \times 3 = 24 / 2 = \text{Size 12 suction catheter} \)
- Adding 4 to the tracheostomy tube size e.g. with a size 8 tube the calculated suction catheter is \( 8+4 = 12 \) suction catheter

11.6 Suctioning Procedure

11.6.1 The Nurse must assemble all the equipment required which includes:

- Gloves (Sterile & non-sterile)
- Suitable suction catheters
- Apron
- Fluid Shield Mask

11.6.2 The Nurse must undertake the following:

- Explain the procedure to the patient
- Perform hand hygiene and apply gloves
- Apply apron and fluid shield mask where necessary for standard universal precautions
- Turn on suction apparatus and test that vacuum pressure is > 20Kpa’s / 100-150mmHg
Where the patient is ventilated, the patient should be hyper-oxygenated (i.e. increase FiO2 to 100%) for > 30 seconds prior to suctioning, to minimise hypoxia during and after the suctioning event. This pre-oxygenation is not routinely required where the patient is self-ventilating on ward.

Open / expose only the vacuum control segment of the suction catheter and attach to the suction tubing.

Apply a disposable sterile glove over the non-sterile gloves and withdraw the sterile catheter from the protective sleeve.

Maintaining sterility, insert the suction catheter to approximately 15cm (roughly a pen's length or a third of the catheter length) without applying suctioning.

Smoothly withdraw catheter from the airway applying continuous suction. This procedure from insertion to removal of suction catheter should take = / < 15secs.

A new sterile catheter and glove must be used for each suction pass.

No more than 3 suction passes should be undertaken at one time.

11.6.3 On completing the procedure the nurse should ensure patient comfort, return FiO2 to baseline, discard equipment as per hospital policy, perform hand hygiene and document procedure in the patient's Tracheostomy Monitoring Sheet (see Appendix 8) (video clips on suctioning available on the SJH Learning hub: to access see Appendix 11)

12.0 Humidification of Inspired Gases

12.1 All patients with tracheostomy tubes require humidification of inspired gases in order to:
- To prevent drying of pulmonary secretions.
- To preserve muco-ciliary function.

12.2 The type of humidification selected for use is determined by the patient’s status and needs.

12.3 The methodology used (See Table 1.0) can be altered as the patient’s condition changes.

12.4 Only one method of humidification should be used at one time i.e. do not combine methods.
Table 1.0: Humidification Methodology Criteria and Equipment Required

<table>
<thead>
<tr>
<th>Humidification Methodology – Selection Criteria</th>
<th>Humidification Equipment Required</th>
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<tbody>
<tr>
<td>Heated Humidifiers</td>
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<tr>
<td>Suitable for</td>
<td>• Heating unit (available from St John’s ward)</td>
</tr>
<tr>
<td></td>
<td>• Sterile water (available from pharmacy stores)</td>
</tr>
<tr>
<td></td>
<td>• Oxygen tubing + water trap</td>
</tr>
<tr>
<td></td>
<td>• Tracheostomy mask.</td>
</tr>
<tr>
<td></td>
<td>• Patients with newly formed tracheostomies</td>
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<tr>
<td></td>
<td>• Dehydrated patients</td>
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<td></td>
<td>• Immobile patients</td>
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<tr>
<td></td>
<td>• Patients with tenacious secretions</td>
</tr>
<tr>
<td></td>
<td>• Heating unit (available from St John’s ward)</td>
</tr>
<tr>
<td></td>
<td>• Sterile water (available from pharmacy stores)</td>
</tr>
<tr>
<td></td>
<td>• Oxygen tubing + water trap</td>
</tr>
<tr>
<td>Heat Moisture Exchange Filters</td>
<td></td>
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<tr>
<td>Suitable for :</td>
<td>• Heat moisture exchange filter i.e. Swedish nose/ sofshield ® bib</td>
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<tr>
<td></td>
<td>• Green oxygen tubing can be clipped onto the Swedish nose if required.</td>
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<td></td>
<td>• Patients that are adequately hydrated</td>
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<tr>
<td></td>
<td>• Mobile patients</td>
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<tr>
<td>Not suitable for patients with copious secretions.</td>
<td></td>
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<tr>
<td>Nebulizers</td>
<td></td>
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<tr>
<td>Nebulized normal saline can be effective in helping loosen secretions and soothe irritable airways</td>
<td></td>
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<tr>
<td>• Nebulizer unit and disposable mask</td>
<td></td>
</tr>
<tr>
<td>• Oxygen tubing.</td>
<td></td>
</tr>
<tr>
<td>• Sterile saline.</td>
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</table>

12.5 **Humidification Management (Nursing)**

12.5.1 **Heated Humidifiers.**

The Nurse is required to undertake the following actions:

- Set up in accordance with Operator’s manual
- Ensure the inspired gases are at body temperature by holding the oxygen tubing against a clean bare inner arm.
- Ensure there is a fine mist coming from the end of the tubing
- Monitor sterile water level and change PRN
- Empty water trap when it reaches half way level or before
- Using clean technique, change all tubing weekly and record date when tubing changed in patient’s healthcare record

12.5.2 **Heat Moisture Exchangers**

The Nurse is required to undertake the following actions:

- Change daily and PRN to keep clean and dry
- Discard soiled Swedish noses in infectious / risk waste.
- Discard Sofshield humidification bibs when soiled and replace
13.0 Cuffed Tracheostomy Tube Care

13.1 Indications for Cuffed Tube Use:

- Immediately post operatively – reduces (does not fully prevent) aspiration of blood or serous fluid from the wound.
- Seals the trachea to facilitate mechanical ventilation.
- Stabilises the tracheostomy tube in the trachea.
- Helps to protect the airway from aspiration due to laryngeal incompetence
- Minimises aspiration of leakage from tracheoesophageal fistula above cuff level

13.2 Cuffed Tracheostomy Tube Nursing Management

13.2.1 Tracheostomy cuff is usually inflated only in the following circumstances:

- The patient is being mechanically ventilated.
- Less than 24/48 hours post insertion.
- Inflation is specifically ordered by doctor e.g. high risk aspiration from gastric or oral secretions.

13.2.2 It is unusual for patients on general ward areas to need their cuff inflated. In the event a patient has an inflated cuff their status must be frequently assessed at least once a day to determine if patient is suitable for cuff deflation.

13.2.3 The assessment and instruction regarding cuff inflation must be undertaken by a member of the ENT, Oral and Maxillofacial team, Anaesthetic team, or Tracheostomy Safety Facilitator.

13.2.4 In the event cuff deflation is indicated the nurse must undertake the following procedures:

13.2.4.1 Explain procedure to the patients.
13.2.4.2 Suction oropharynx to remove any secretions that may have pooled on top of the inflated cuff.
13.2.4.3 With the assistance of a 2nd nurse, suction via tracheostomy tube while the second nurse slowly aspirates air from air inlet port.
13.2.4.4 Once deflated, expiratory noises may be heard as air passes up around the tracheostomy tube. The Nurse must reassure the patient that this is normal and will settle.

13.2.5 Indications for cuff re-inflation (National Hospital for Neurology and Neurosurgery 2003)

- Desaturation (must check inner cannula first)
- Respiratory or cardiovascular distress
- Constant oral drooling
- No swallows observed
13.2.6 In the event **cuff re-inflation** is indicated the Nurse must undertake the following procedures:

- Inject approximately 5-7mls of air via the air inlet port to achieve airway seal
- Check cuff pressure (See 13.2.7)
- Apply a one-way valve system to prevent injected air from escaping.

13.2.7 Cuff Pressure Measurement

13.2.7.1 Where a cuff is inflated the cuff pressure must be measured (See Appendix 7 for procedure) and recorded on Tracheostomy Monitoring Sheet (See Appendix 8) at least daily or more frequently where the indicated for a specific patient or ward/unit policy/SOP.

13.2.7.2 Cuff pressures must be measured using a hand held cuff manometer attached to the air inlet port of the tracheostomy tube. Palpation of the external balloon is **not** an adequate method of pressure estimation (Faris et al 2007).

13.2.7.3 The recommended cuff pressure is 25cmH2O or as per manufacturer’s guidelines (Serra 2000, Bissell 2004, Faris 2007).

13.2.7.4 High pressures may be required to prevent leaks during positive pressure ventilation however; cuff pressures should not exceed 32cmH20.

13.2.7.5 In the event air continues to leak with pressure exceeding 32cmH20, this indicated that the tube needs to be upsized or a trial of an adjustable flange tube should be undertaken to achieve adequate seal.

13.2.7.6 An over-inflated cuff i.e. cuff pressure is too high, can lead to trauma of the tracheal mucosa which can cause ulceration or stenosis.

13.2.7.7 An underinflated cuff i.e. pressure too low, can lead to inadequate seal around the cuff increasing risk of aspiration and causing loss of positive pressure where the patient is ventilated.

13.2.7.8 Manometers must be cleaned by the User with Klorsept 17 between patients.

(Video clips on cuff pressure monitoring available on the SJH Learning hub: to access see Appendix 11)
14.0 Fenestrated Tracheostomy Tube Care

14.1 Indications for use: To facilitate / improve speech - The fenestration (hole) allows increased volumes of air to be forced up through the larynx during exhalation and enables speech.

Fenestrated Tube (i.e. with holes)

14.2 Nursing Considerations

14.2.1 A fenestrated tracheostomy tube can only function as such if both the outer and inner cannula contain a fenestration (hole)

14.2.2 The fenestration allows secretions as well as air to pass up and down the patient’s airway. Therefore the patient should be provided with a sputum container, tissues and infectious waste bag for secretions as needed

14.3 Speaking with Fenestrated Tube

14.3.1 Speaking may be facilitated by inserting the fenestrated inner cannula, and occluding the tracheostomy tube opening by using one of the following:
  - The patient’s finger (ensure patient cleans hands prior)
  - A speaking valve
  - A decannulation plug / cap / button

14.3.2 The cuff must always be deflated

14.3.3 In the event suctioning is required a non-fenestrated inner cannula must be used. This prevents the suction catheter passing through the fenestration and traumatising the delicate lining of the posterior tracheal wall.

15.0 Communication

15.1 Normally speech is obtained by a steady stream of air that comes from the lungs and passes through the vocal cords. When a tracheostomy tube is inserted, most of the air bypasses the vocal cords and goes out through the tube so patients may be unable to communicate verbally.

15.2 Where a person has a cuffless tube or a deflated cuff some air may leak up to the vocal cords, and allow leak speech but it may not be forceful enough to drive the vocal cords into vibration, or it may only allow enough force for very short utterances. (See image above)
15.3 All patients with a tracheostomy should be referred to a Speech and Language Therapist (SLT) to support and facilitate their communication needs.

15.4 Nonverbal Communication

15.4.1 Non-verbal communication should be encouraged, supported and facilitated for patients with a tracheostomy from the beginning. This includes encouraging patients to use practices such as:
- Mouthing/gesture
- “Yes/no” questions
- Pen & paper
- Communication chart (pictures, alphabet chart)
- Technical aids such as iPad, Lightwriter, Gotalk

15.4.2 Healthcare workers should be aware that patients may have a co-occurring speech and/or language impairment e.g. dysarthria, dysphasia and collaborate with the SLT for further advice and support

15.5 Verbal Communication / Speaking Valves

15.5.1 A speaking valve is a one-way valve that redirects expiratory airflow through the larynx, facilitating voice projection (See image attached)

15.5.2 Passy Muir (PMV) speaking valves are used in SJH

15.5.3 Passy Muir (PMV) speaking valves can be worn by both ventilated (aqua valve and connector) and non-ventilated (aqua or clear valves) patients.

15.5.4 Patient must be at least 48-72 hours post tracheostomy, prior to the initial placement of a speaking valve

15.5.5 The tube cuff, where present, must be fully deflated prior to placement of speaking valve

15.5.6 Patients post head and neck surgery must have an initial assessment and valve placement undertaken by a Speech and Language Therapist as there is a high incidence of co-occurring speech deficits in this patient group

15.5.7 Contraindications for Speaking Valve Use
The use of speaking valves is contraindicated in the following circumstances:
- Patient cannot tolerate full cuff deflation.
- Patients immediately post head & neck surgery.
- Upper airway obstruction/tracheal oedema or stenosis.
- Medical instability including end-stage pulmonary disease.
- Severe aspiration/copious tenacious secretions.
- Anarthria/severe dysarthria.
- Unconscious/comatose patients.
- Laryngectomy
15.5.8 Benefits of Passy Muir Speaking Valves include the following:

- Improved vocalization
- Less potential for infection when compared to finger occlusion
- Positive effects on swallow and secretion management
- Improved oxygenation and pulmonary function
- Improved taste and smell

15.5.9 Use/Care of the Speaking Valve

15.5.9.1 The speaking valve should be worn for short periods initially and gradually increased as tolerated. Staff should liaise with the SLT for specific advice / guidance.

15.5.9.2 The speaking valve should be removed in the event the patient experiences breathing difficulties.

15.5.9.3 The safety strap on the clear Passy Muir valve should be attached to the tracheostomy tube tie.

15.5.9.4 The speaking valve should be removed when the patient is sleeping with the consent of the patient or when advised by SLT/Tracheostomy Safety Facilitator.

15.5.9.5 The speaking valve should be worn for all oral trials.

15.5.9.6 The valve must be cleaned daily in mild soapy water, rinsed thoroughly in cool-tepid water (not hot) and let air dry.

15.5.9.7 Staff should take care not to discard the speaking valve when changing the t-tube. A speaking valve should last for 2-3 months.

See Appendices 4, 5 and 6 for more information regarding the Passy Muir Valve Care.

16.0 Swallowing

16.1 All patients with a tracheostomy should be referred to Speech & Language Therapy (SLT) for dysphagia/swallow assessment.

16.2 Impact of Tracheostomy on Swallowing

16.2.1 Patients with a tracheostomy may be on an oral diet with a t-tube in situ however the potential for swallowing difficulties is heightened with the presence of a t-tube due to the mechanical and physiological changes to the swallowing process (Dikeman & Kazandjian 1995).

16.2.2 Lack of airflow through the larynx will cause a gradual reduction in laryngeal sensation.

16.2.3 Natural reflexes such as coughing and throat clearing could be impaired. Consequently, aspiration can be silent and difficult to detect at the bedside (Dikeman & Kazandjian 1995).

16.2.4 It should be considered that many patients with a tracheostomy also have an underlying condition, predisposing them to swallow impairment.

16.2.5 All patients must be referred for a full swallow assessment prior to commencing oral intake.
16.3 Signs of Dysphagia.

16.3.1 In the event any of the following signs are observed the patient may have dysphagia and should be Nil by Mouth (NPO) and referred to SLT for review.
- Throat clearing/coughing during or after eating/drinking
- Food/fluid stained secretions seen on suctioning
- Wet, gurgle voice
- Difficulty in swallowing
- Repeated swallows required to clear a single bolus
- Increased respiration rate during eating/drinking
- Decreased SpO2 during eating/drinking
- Repeated, unexplained RTIs

16.3.2 Dysphagia Assessment
In order to undertake a safe effective swallow assessment the healthcare worker must ensure the following:

16.3.2.1 The patient must be alert.
16.3.2.2 Suction facilities must be available
16.3.2.3 Patient’s tracheostomy tube must be uncuffed or have a deflated cuff.
16.3.2.4 Patients should be able to tolerate speaking valve for periods of at least 15-20mins.

16.3.3 In the event additional advice or support is required the HCW should seek the assistance of the SLT

16.4 Inflated Cuff Myths
In caring for a patient with a cuffed tube staff must be aware that an inflated cuff does not prevent aspiration and take the following into consideration:

- Does not prevent aspiration!
- Bolus already aspirated (below the vocal cords) before it reaches the inflated cuff.
- Bolus, particularly fluids, can still slide past an incomplete cuff seal to the lungs.
- Aspirated materials may pool above the cuff and be aspirated on cuff deflation. Tracheal suctioning of most types of t-tubes will not remove food sitting on cuff.
- Bacterial colonisation may occur if food/saliva continues to accumulate above the cuff, which may make its way to the airway.

16.5 Strategies to Minimize Aspiration Risk & Manage Dysphagia
In order to manage dysphagia and minimise the risk of aspiration in patients with a tracheostomy healthcare workers must observe the following procedures:

16.5.1 Follow the instructions and swallowing guidelines provided by SLT in the patient’s healthcare record i.e. chart and/or ICIP

16.5.2 Give modified food and thickened fluids where recommended
16.5.3 Ensure patient is alert and sitting upright in advance of taking any food or fluids

16.5.4 Facilitate the flow of air through the vocal tract by using a speaking valve to divert the airflow through the larynx during exhalation. This will further assist swallowing by improving cough production and increasing pharyngeal sensation is increased

16.5.5 Facilitate the flow of air through the vocal tract by using a fenestrated inner cannula where a fenestrated tracheostomy tube is insitu

16.5.6 Monitor for food/fluid stained secretions when suctioning

16.5.7 Monitor patient for signs of dysphagia (Refer 16.3.1) including chest/ respiratory function and report to Medical Team, SLT and/or Tracheostomy Nurse as appropriate

16.5.8 Where there is a concern that patient has dysphagia and is aspirating food the following assessments should be considered:
   - Blue dye test: Blue dye is administered by SLT / Tracheostomy Nurse and the nurse is required to monitor and report the presence of blue dye in tracheal secretions
   - A Video fluoroscopy (VFU) or fibre-optic endoscopic evaluation of swallowing (FEES) may be required

16.5.9 Where there is any indication that the patient may be not swallowing sufficiently or aspirating the parson caring for the patient must stop their food/fluid intake i.e. NPO status and report to the patient’s medical team. SLT and Tracheostomy Nurse

17.0 Tracheostomy Patient Transfer (Internal)

17.1 In the event a patient with a tracheostomy is being transferred to another department / Ward the transfer must be managed in accordance with the Hospital’s Patient Transfer Protocol (SJH:NA(Pt)061). In addition the following should be considered and catered for:

17.1.1 In the event the patient is receiving heated humidified oxygen via a tracheostomy mask the Nurse should connect the patient to a ‘Swedish Nose’ and green oxygen connector for the transfer. Theses are available on St. Johns ward, Anne Young ward, Private 2 ward and HDU. (See Images below)

17.1.2 It is left to the discretion of the nurse in charge to determine if the patient requires an escort.

17.1.3 A competent nurse should accompany the patient in the event the patient is likely to require clinical intervention during the transfer e.g. suctioning or if the patient is medically unstable.

17.1.4 A competent Nurse or HCA must accompany the patient in the event they are confused / agitated and at risk of dislodging their tracheostomy tube

17.1.5 In the event the patient is assessed as not requiring an escort the ward nurse must contact the receiving department prior to the patient leaving the ward to inform them that the patient has a tracheostomy tube in place and to expect their arrival.
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18.0 Tracheostomy Tube Change

18.1 Elective Indications
- Tracheostomy tubes must be changed every 28-30 days to comply with EU regulations.
- For weaning purposes i.e. downsizing, change to cuffless or fenestrated.

18.2 Emergency Elective
- Tube dislodgement or accidental removal.
- Tube obstruction (decreased risk when using double lumen tubes).

18.3 The recommended minimum time before the first tube change or decannulation is
- 5-7 days following surgical tracheostomy
- 7-10 days following percutaneous tracheostomy.
**Rationale:** To enable the tract to become established and minimise risk of occlusion.

18.4 The decision to carry out the 1st tube change or tube removal must be made by a senior member of the E.N.T, Oral and Maxillofacial or Anaesthetic Team

18.5 The 1st Tube change must always be carried out by a doctor or the Tracheostomy Safety Facilitator

18.6 The Anaesthetist must be present or within the ICU department if tube change is required on a ventilated patient.
**Rationale:** The tract from the skin to the trachea may not be well formed.

18.7 Subsequent tube changes can be undertaken by a registered nurse who has been assessed and is deemed competent in the procedure (St John’s ward Anne Young ward, ICU/HDU, KSICU/HDU) within his/her Scope of Nursing Practice.
18.8 The change procedure must always be undertaken by 2 nurses (See Exception 18.9) to ensure patient safety at all times and all changes should be recorded in both nursing and medical notes. **Rationale:** To enable the procedure to be carried out safely during early tube changes. The second nurse is available to summon help if required.

18.9 In the event the patients has undergone a laryngectomy, subsequent tracheostomy tube changes can be undertaken by one competent nurse under the direction of the ENT Team as the tract is well formed as the trachea is brought forward to the skin and the tracheal rings keep the stoma open.

18.10 A tracheostomy tube with an inner cannula insitu has a life span of 30days. **Rationale:** If the tube is left in any longer it does not comply with the manufacturer’s recommendations or with the EEC Directive (Class 11A, Rule 7. Council Directive Concerning Medical Devices 93/94 EEC).

18.11 Before changing the tracheostomy tube, the type of tube, size, the date it was performed and last changed should be known. **Rationale:** To ensure that the correct tube size is used and to give an indication of how well formed the tract will be.

18.12 If the patient is being fed via naso-gastric or PEG tube, medical opinion should be sought as to need to hold the feed. If the patient is ventilated the feed is usually held for 4 hours before tube changed. **Rationale:** To reduce the risk of aspiration of the feed during tube change.

18.13 Emergency equipment must be close at hand and checked before any patient undergoes a tracheostomy tube change. **Rationale:** To maintain safety at all times.

18.14 Equipment required for Changing both Shiley and Portex Tracheostomy Tubes:
- Functional suction and oxygen apparatus.
- Clean working area with dressing pack.
- New tracheostomy tube to be inserted.
- Smaller size tracheostomy tube in case of difficulties.
- Tracheal Dilators.
- Tracheostomy dressing (Key-hole) if required.
- Normal Saline – for cleaning area.
- Lubricating jelly (KY).
- Tracheostomy ties – Velcro or ET tape.
- Disposable gloves and apron.
- Eye protection.
- Scissors (if ET tape used).
- Stitch cutter (if stitched in).
- 10ml syringe (for cuffed tube).
18.15 Tracheostomy Tube Change Procedure

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Prepare all equipment needed and check that it is in working order.</td>
<td>To minimise risk to patient.</td>
</tr>
<tr>
<td>▪ Explain the procedure to the patient.</td>
<td>To reassure the patient and to gain his/her verbal consent.</td>
</tr>
<tr>
<td>▪ Position the patient in a semi-recumbent position making sure neck is slightly extended - if tolerated, place rolled towel between scapula</td>
<td>The patient should be as comfortable as possible during the procedure. Having the neck slightly extended will better facilitate tube removal and reinsertion of new tube.</td>
</tr>
<tr>
<td>▪ Perform hand hygiene, don apron and eyewear preparing the dressing trolley as per hospital infection control guidelines.</td>
<td>To reduce the risk of cross-infection.</td>
</tr>
<tr>
<td>▪ Open the tracheostomy tube onto the opened dressing pack. Don sterile gloves.</td>
<td>To check for air leaks within the cuff. Tube should be discarded if spontaneously deflates.</td>
</tr>
<tr>
<td>▪ If the new tube to be used is to be cuffed, check the cuff by inflating it using 10ml syringe and observe it for spontaneous deflation. Deflate the cuff.</td>
<td></td>
</tr>
<tr>
<td>▪ Check that the obturator (introducer) can be removed from the new tube.</td>
<td>To familiarise yourself with removing the obturator prior to insertion.</td>
</tr>
<tr>
<td>▪ Attach tracheostomy velcro holder/cotton ties. The use of cotton tape is recommended if the patient is confused or neurological status unknown.</td>
<td>To ensure that the tube is ready for immediate securing when inserted. Velcro ties are not considered safe for use in relation to confused/agitated patients.</td>
</tr>
<tr>
<td>▪ Lubricate the tube sparingly with water soluble lubricant.</td>
<td>To facilitate insertion. Too much lubricant will cause the patient to cough.</td>
</tr>
<tr>
<td>▪ Remove the old dressing and clean around site.</td>
<td>To clean and remove any debris/superficial organisms.</td>
</tr>
<tr>
<td>▪ If tracheostomy is not newly formed, cleansing is carried out following tube removal.</td>
<td>If tracheostomy well established, no risk of the tract closing, therefore site can be inspected more closely.</td>
</tr>
<tr>
<td>▪ Consider hyperoxygenation with 100% oxygen if patient is oxygen dependant and monitor oxygen saturation levels closely</td>
<td>To reduce the risk of hypoxia during the procedure</td>
</tr>
<tr>
<td>▪ Suction the oropharynx - if the cuff is inflated a synchronised cuff deflation and suction technique using 2 practitioners is required. Slowly deflate the cuff using a 10ml syringe until all the air is withdrawn.</td>
<td>The cuff needs to be fully deflated prior to removal. Synchronised suctioning helps prevent any secretions from pooling in the oro-pharynx and entering the lungs.</td>
</tr>
<tr>
<td>▪ Once the patient is relaxed and not coughing, release the old ties and remove the old tracheostomy tube on expiration</td>
<td>Ensuring the patient is relaxed and not coughing will facilitate removal of the tube. Expiration allows neck/shoulders to become more relaxed Coughing tenses the neck muscles making tube insertion more difficult</td>
</tr>
<tr>
<td>▪ Anaesthetic team should assess if patient requires sedation</td>
<td></td>
</tr>
<tr>
<td>▪ The tube is removed with an upward and downwards motion.</td>
<td>This motion follows the natural contours of the neck.</td>
</tr>
</tbody>
</table>
**Action** | **Rationale**
--- | ---
* Insert the new tube with the obturator in place in an ‘up and over’ motion.  
**Immediately** remove the obturator and insert the inner cannula. | The obturator helps guide the tube along the contour of the patient’s neck.  
**The patient will be unable to breathe if the obturator is blocking the lumen.**
* Observe and listen to the patient for signs of respiratory distress. Check for good airflow through the new tube and observe the chest for rising and falling movements. | To ensure that the new tube is in the correct position. Air flow will be felt via the tracheostomy tube.
* Secure the tube with the attached Velcro holder or cotton ties tape. | To prevent dislodgement of the tube.
* If the tube is cuffed and cuff is being inflated re-inflate the cuff with approx 5-7mls air or to a safe pressure <25mmHg (check with manometer if available). | Over inflation of cuff will cause tracheal mucosal damage.
* Ensure patient is comfortable with no signs of breathing difficulties. Restart/attach oxygen therapy / ventilation / passy muir speaking valve (always use speaking valve when cuff deflated). | To ensure oxygen levels and patient’s breathing is satisfactory.  
To restore patients speech, cuff inflation will cause airway obstruction if valve is insitu.
* Record the tube change in the patient’s notes documenting the date, time size, types of tube and any complications experienced during the procedure. | To facilitate continuity of care and establish clear accountability for role

**19.0 Tracheostomy Weaning and Removal.**
An aim of weaning is to liberate the patient from their artificial airway and to ensure that respiratory difficulties will not occur after airway decannulation (Godwin 1991).

In the event a patient is identified as suitable to commence weaning the doctor/nurse must undertake the following procedures in order to ensure and facilitate safe and effective decannulation.

**19.1 Patient Suitability (i.e. Scope)**

19.1.1 Patients with a Surgical or Percutaneous Tracheostomy may be candidates for weaning in accordance with the following procedures.

19.1.2 Patients with a Permanent Tracheostomy e.g. Total Laryngectomy are not candidates for weaning.

**19.2 Weaning Readiness**
Weaning can only commence once all the following criteria have been met (Decisive factors for Weaning (Godwin 1991)):

- The patient must be medically stable  
- The primary indication for tracheostomy has been resolved.  
- The patient should be spontaneously breathing off the ventilator for 24-48 hours.  
- The patient has an adequate ventilatory reserve.  
- The patient has an effective cough reflex (where possible)
The patient must be free from serious bronchopulmonary infection
- There is minimal pulmonary secretions (suctioning < 4-6 hourly)
- O2 Therapy is less that 40% (FiO2 < .4)
- Patient hass successfully tolerating cuff deflation.
- Patient has an adequate nutritional intake
- Patient has had adequate sleep.
- There is psychosocial support available to patient as needed

19.3 Weaning Procedure
There are 4 stages to the weaning process (but not all patients will go through each stage of the process). These are as follows:
- Stage 1: Patient tolerance for **Cuff deflation**
- Stage 2: Patient tolerance to **Downsizing the Tracheostomy tube** (not routine at present)
- Stage 3: Patient tolerance to use of **Passy Muir Speaking Valve**
- Stage 4: Patient tolerance to **Decannulation cap** (not routine)

<table>
<thead>
<tr>
<th>Stage 1 Weaning – Cuff Deflation</th>
<th>Procedure Indications &amp; &amp; Rationale</th>
<th>Nursing Considerations and Management</th>
</tr>
</thead>
</table>
| **Cuff Deflation**               | This is usually carried out 24 – 48hrs after tube insertion unless otherwise indicated. | In the event the patient has an inflated cuffed tracheostomy tube in place the deflation should be undertaken as column over:  
- Provide a full explanation of all procedures and reassurance must be given to the patient.  
- The weaning programme must be planned in advance by the multidisciplinary team with the patient  
- The patient needs to be in maximum view of the nursing station, with their call bell within easy reach.  
- **Patient must be sitting in an upright position if tolerated**  
- Patient must be attached to a SaO2 monitor.  
- All secretions in the oropharynx must be cleared using suction catheter, patient is asked to cough.  
- With a fresh suction catheter attached suction is undertaken while simultaneously deflating the tracheostomy tube cuff with a 10ml syringe gradually.  
- A Competent Practitioner will assess cuff deflation tolerance, e.g. Tracheostomy Safety Facilitator/SLT  
- Document progress  
- Remain with the patient, observe and monitor for respiratory distress.  
- **Re inflate cuff if patient becomes distressed.** |
|                                 | Why? To assess if patient can manage their own airway and manage their own oral secretions despite alteration in tracheal airflow. | In the event the patient has an inflated cuffed tracheostomy tube in place the deflation should be undertaken as follows: |
|                                 | In the event the patient has an Un-cuffed Tracheostomy tube or a Cuff less tracheostomy tube insitu, move directly on to Stage 2. |  
- In the event the patient has an Un-cuffed Tracheostomy tube or a Cuff less tracheostomy tube insitu, move directly on to Stage 2.  
- Patient must be attached to a SaO2 monitor.  
- All secretions in the oropharynx must be cleared using suction catheter, patient is asked to cough.  
- With a fresh suction catheter attached suction is undertaken while simultaneously deflating the tracheostomy tube cuff with a 10ml syringe gradually.  
- A Competent Practitioner will assess cuff deflation tolerance, e.g. Tracheostomy Safety Facilitator/SLT  
- Document progress  
- Remain with the patient, observe and monitor for respiratory distress.  
- **Re inflate cuff if patient becomes distressed.** |
### Stage 2: Downsizing the Tracheostomy Tube (not routinely undertaken in all patients)

<table>
<thead>
<tr>
<th>Indications &amp; Rationale</th>
<th>Nursing Considerations and Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where downsizing of the Tracheostomy Tube is indicated it is usually undertaken 5-7 days after the original tube insertion</td>
<td>Following successful patient tolerance for cuff deflation the following must be undertaken:</td>
</tr>
<tr>
<td><strong>Rationale:</strong> Airflow is increased either around or through the tracheostomy tube and this reduces the work of breathing for the patient.</td>
<td>- Downsize the Tracheostomy Tube to a smaller size cuff tube.</td>
</tr>
<tr>
<td></td>
<td>- Check with Multidisciplinary Team regarding the possible benefits of using a use of a fenestrated tube at this time</td>
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<tr>
<td></td>
<td>- Ensure the emergency tracheostomy tray with all equipment required is present at patients’ bedside.</td>
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<tr>
<td></td>
<td>- <strong>The first tube change must always be undertaken by a Dr or Tracheostomy Safety Facilitator</strong></td>
</tr>
<tr>
<td></td>
<td>- Leakage of air +/- secretions around the new tracheostomy tube may be observed following insertion of a smaller tube</td>
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<tr>
<td></td>
<td>- This should reduce and settle once the stoma reduces in size around the new tube</td>
</tr>
<tr>
<td></td>
<td>- Monitor, reassure and observe patient.</td>
</tr>
<tr>
<td></td>
<td>- Sometimes a second downsizing may be necessary before proceeding to stage 3, this will be patient specific.</td>
</tr>
</tbody>
</table>

### Stage 3 – Tolerance to use of Passy Muir Speaking Valve

<table>
<thead>
<tr>
<th>Indications &amp; Rationale</th>
<th>Nursing Considerations and Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>In order to determine tolerance of a Passy Muir Speaking Valve the patient must be at least 48-72 hours post tracheostomy, prior to the initial placement of a speaking valve. Refer to protocol for ventilated patients including contraindications (See Appendix 5 and 6)</td>
<td>Patient should be sitting in an upright position if tolerated</td>
</tr>
<tr>
<td><strong>Rationale:</strong> This is a one way valve which covers the opening of the tracheostomy, allowing air in through the valve on inspiration, but closing on expiration, thus diverting the air past the vocal cords and out through the nose and mouth of the patient. Where speaking valve is tolerated the patient and valve should be managed as directed in Section 15.5 which includes the following:</td>
<td>- Cuff must be deflated prior to using / applying the speaking valve</td>
</tr>
<tr>
<td></td>
<td>- Perform suction of the oropharynx and trachea</td>
</tr>
<tr>
<td></td>
<td>- Place the speaking valve on the outer rim of the tracheostomy tube</td>
</tr>
<tr>
<td></td>
<td>- Continuously monitor the patient’s oxygen saturations</td>
</tr>
<tr>
<td></td>
<td>- Commence with a 5-15 min period where speaking valve applied</td>
</tr>
<tr>
<td></td>
<td>- Stay with the patient during this period or until the patient is confident wearing the valve</td>
</tr>
<tr>
<td></td>
<td>- Offer the patient reassurance and observe and monitor for respiratory distress.</td>
</tr>
<tr>
<td></td>
<td>- <strong>In the event there are any signs of distress remove the speaking valve</strong></td>
</tr>
<tr>
<td></td>
<td>- After the initial 15mins trial period the patient should be allowed to rest for a period of a least 30 mins before trying again (some patients may need longer).</td>
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<tr>
<td></td>
<td>- Document progress</td>
</tr>
<tr>
<td></td>
<td>- Extend the period of the speaking valve insertion in 15 – 30 min increments as the patient tolerates</td>
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<tr>
<td></td>
<td>- Aim is to increase tolerance to all day.</td>
</tr>
<tr>
<td></td>
<td>- In the event the patient is extremely tolerant with no complications, the speaking valve can be left on and then substituted for a decannulation cap (See Step 4).</td>
</tr>
<tr>
<td></td>
<td>- Due to changes in ventilation during sleep, the speaking valve must not be left in overnight even where it might be tolerated by some patients)</td>
</tr>
</tbody>
</table>
### Stage 4: Tolerance to Decannulation Cap (Not routinely undertaken in all patients)

<table>
<thead>
<tr>
<th>Procedure Indications &amp; Rationale</th>
<th>Nursing Considerations and Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Decannulation Cap is a device that effectively blocks the tracheostomy tube so that the patient must now breathe through their nose and mouth.</td>
<td>The use of a decannulation cap can only be attempted following successful patient tolerance of Speaking Valve and liaison with Tracheostomy Safety Facilitator and the patient’s medical team. The Nurse trialling the cap should undertake the following:</td>
</tr>
<tr>
<td>• Rationale</td>
<td>• Ensure patient is sitting in an upright position if tolerated</td>
</tr>
<tr>
<td>The use of a decannulation cap increases patient confidence and gradually increases respiratory muscle strength and avoids over exertion.</td>
<td>• Ensure Cuff is deflated</td>
</tr>
<tr>
<td>• Once capping is tolerated for at least 24 consecutive hours the appropriate medical team and the Tracheostomy Safety Facilitator in collaboration with the patient will decide if decannulation can occur.</td>
<td>• Perform suction of the oropharynx and trachea</td>
</tr>
<tr>
<td></td>
<td>• Place the Decannulation Cap on the tracheostomy tube connection and apply the Decannulation Cap over the inner cannula</td>
</tr>
<tr>
<td></td>
<td>• Continuously monitor the patient’s oxygen saturations, and administer oxygen if prescribed.</td>
</tr>
<tr>
<td></td>
<td>• Commence with a 5 – 15 min trial period (Decannulation Cap applied)</td>
</tr>
<tr>
<td></td>
<td>• Stay with the patient during the first wearing i.e. the 5 -15 minuet trail or until the patient is confident wearing the Cap</td>
</tr>
<tr>
<td></td>
<td>• Remain with the patient reassure, observe and monitor for respiratory distress</td>
</tr>
<tr>
<td></td>
<td>• Decannulation Cap is left on for as long as patient tolerates it.</td>
</tr>
<tr>
<td></td>
<td>• Any signs of distress remove the Decannulation Cap immediately</td>
</tr>
<tr>
<td></td>
<td>• Encourage patient to call for assistance if required</td>
</tr>
<tr>
<td></td>
<td>• Where appropriate instruct the patient in how to remove the cap themselves in the event they experience any breathing difficult or discomfort</td>
</tr>
<tr>
<td></td>
<td>• The Decannulation Cap is usually left on overnight.</td>
</tr>
<tr>
<td></td>
<td>• Record activity.</td>
</tr>
<tr>
<td></td>
<td>• Once capping is tolerated for at least 24 consecutive hours the appropriate medical team and the Tracheostomy Safety Facilitator in collaboration with the patient will decide if decannulation can occur.</td>
</tr>
</tbody>
</table>

Tracheostomy Care Guidelines: SJH:NA(G):009: Version 4
### Stage 5: Decannulation (Removal of the Tracheostomy Tube)

<table>
<thead>
<tr>
<th>Procedure Indications &amp; Rationale</th>
<th>Nursing Considerations and Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ <strong>Indication</strong></td>
<td>The Tracheostomy tube is removed only with the agreement of the patient and the multidisciplinary team caring for the patient. The Team and clinician undertaking the procedure must ensure the following:</td>
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<tr>
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<td>▪ The patient is fully informed about the procedure.</td>
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<td>▪ The Decannulation is planned agreed and undertaken in optimal conditions which include:</td>
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<td>▪ When the patient is well rested (usually in the morning following a good night’s rest)</td>
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<td>▪ There is optimum staff in the area i.e. Monday – Thursday, 9am – 4pm</td>
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<td>▪ All staff on duty should be made aware of the intended decannulation.</td>
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<td>▪ The patient should be located in maximum view of the nursing station</td>
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<td>▪ The patient must be provided with a functional call bell and shown how to use it</td>
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<td>▪ Patient must be sitting in an upright position if tolerated</td>
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<td>▪ Patient’s respiratory depth, rate and rhythm and oxygen saturations must be continuously monitored and recorded</td>
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<td>▪ The patient should be attached to a SaO2 monitor.</td>
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<td></td>
<td>▪ All secretions in the oropharynx and trachea are cleared using suction catheter, and patient is asked to cough.</td>
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<td>▪ Adherence to universal precautions essential</td>
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<td>▪ Protective clothing and PPE should be worn</td>
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<td>▪ The Staff member undertaking the procedure should undertake the following:</td>
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<td></td>
<td>▪ Loosen Tracheostomy ties</td>
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<td>▪ Gently but firmly withdraw the tube in an outward and downward movement</td>
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<td>▪ Ensure the area is clean and dry once the tube is removed</td>
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<td></td>
<td>▪ Apply a dry dressing and secure with an occlusive airtight film dressing. <strong>Do Not Use Sleek</strong></td>
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<td>▪ Review dressing and stoma site PRN</td>
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<td></td>
<td>▪ Monitor the patient closely for signs of respiratory distress.</td>
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<td>▪ Encourage deep breathing exercises, coughing and reassure the patient</td>
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<tr>
<td></td>
<td>▪ Keep emergency tracheostomy tray by the patient’s bedside until patient is at least 24 hours post decannulation</td>
</tr>
<tr>
<td>▪ <strong>Decannulation Predictors</strong></td>
<td>▪ Patient has successfully completed the latter 4 stages of weaning. NB (<em>not all patients will go through each stage of the process</em>)</td>
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<tr>
<td></td>
<td>▪ Patient is able to expectorate pulmonary secretions effectively</td>
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<tr>
<td></td>
<td>▪ Patient is not myopathic</td>
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20.0 Tracheostomy Emergencies

20.1 Safe Practice
These tracheostomy guidelines have been designed to support ward based nurses and allied health professionals in the safe and effective management of the patient with a tracheostomy. It is recognised that many healthcare workers find unforeseen tracheostomy emergencies extremely stressful. Prompt recognition of symptoms and appropriate response (as directed herein) are paramount in delivering effective intervention and care.

20.1.1 Staff caring for a patient with a tracheostomy must be aware and understand the purpose of a tracheostomy i.e. to maintain the patient’s airway and permit the removal of broncho-tracheal secretions.

20.1.2 Staff assigned to the patient’s care must ensure that they are informed and aware regarding the following patient-specific information:
- Why the tracheostomy was performed in the first instance.
- Whether the upper airway is patent, obstructed partially or completely.
- How long the tracheostomy has been established (McGrath & Bates 2011)

20.1.3 Each patient who has a tracheostomy should have a Green Tracheostomy Sign displayed above their bed. ALL information required regarding the patient’s tracheostomy are recorded on the Tracheostomy Sign. The reverse provides Tracheostomy Emergency Management Algorithm (Appendix 9)

20.1.4 The most commonly occurring emergencies associated with managing a patient with a Tracheostomy are as follows:
- Respiratory/Cardiac Arrest
- Tube occlusion
- Accidental decannulation / tube falls out
- Resuscitation of an adult with a laryngectomy stoma
This guideline provides basic step-by-step procedures that must be undertaken by healthcare staff responders in the event any of the above emergencies occur.

20.1.5 In general responders must note that maximum ventilation and oxygenation occurs when there is a Cuffed, Non-Fenestrated tube insitu.

20.1.6 In the event an emergency occurs where a patient has a Cuffless fenestrated tube insitu, the aim is to change the tube to a Cuffed, Non-Fenestrated tube as soon as possible i.e. as soon as a competent practitioner becomes available.
20.1.7 In order to commence effective ventilation the responder should immediately change the inner tube to a non-fenestrated type as is done for general suctioning of a patient with a fenestrated tube in situ.

20.1.8 To commence ventilation the responder should undertake the following actions to prevent air escaping through the upper airway:
- Gently tilt the patient’s chin upwards
- Seal the patient’s mouth
- Hold the patient’s nose shut with index finger and thumb

20.1.9 Respiratory/Cardiac Arrest Response for a Patient with a Tracheostomy (As SJH Resuscitation Guidelines plus additional Tracheostomy Requirements)

In the event a patient is observed to have collapsed the Responder should ensure a safe approach and proceed as follows:
- Check the patient and see if he/she responds
- If unresponsive call the Cardiac Arrest Team Dial 2222
- Open the airway by:
  - Lie the patient flat
  - Remove any clothing from the neck, including any stoma cover but do not remove any tube in place.
  - Check patency of inner cannula.
  - Use support under the shoulders to ensure that the neck is fully extended
- Assess Breathing – take at least 5 seconds and no more than 10 seconds in order to establish the following:
  - Is patient breathing adequately (other than occasional gasps)?
  - Has the patient a cuffed tube in situ?
    - If yes ensure that it is inflated
    - If no change to a cuffed tube – Competent practitioner only
- Give 2 breaths via the tracheostomy tube – deliver the breath over 1 second to make the patient’s chest rise
- Attach a catheter mount to the top of the cuffed tracheostomy tube
- Attach the Bag Valve Mask BVM to 15L oxygen
- Remove face from BVM apparatus and attach catheter mount. (See Appendix 2 for image)
- Assess Carotid Pulse – take at least 5 seconds and no more than 10 seconds
- If confident that a pulse is present continue with rescue breathing providing one breath every 5-6 seconds and reassess carotid pulse every 2 minutes.
- In the event there is no pulse present commence chest compressions by
  - Placing the heel of one hand on the centre of the patient’s bare chest
  - Putting the heel of the other hand on top
  - Perform compression at a depth of 1½ - 2 inches
  - Perform compression at a rate of 100 per minute
  - Allow full chest recoil
- Continue with Basic Life Support until arrival of cardiac arrest team
- Basic Life Support requires providing 30 Compressions to 2 breaths for 5 cycles and then change / rotate compressor every 5 cycles

20.1.10 Tube Occlusion: Partial/Complete
In the event a patient is observed to have or potentially have tube occlusion the Responder should proceed as follows:
- Assess the patient for signs of respiratory distress
- Check patency of Inner Cannula and change of necessary
- Call for help as appropriate. Consider:
  - Ward Staff
  - ENT/Max Fax team
  - Tracheostomy Safety Facilitator #538
  - Anaesthetics #889
- Administer oxygen to both tracheostomy and face if has patent upper airway.
- Monitor oxygen saturation level
- Suction patient as per guidelines.

20.1.10.1 In the event the tracheostomy tube remains occluded the responder should undertake the following (Except in ICU setting):
- Remove the tube - Ensure cuff is deflated prior to removal if cuffed tube insitu
- Apply Ambu-Bag
- Await anaesthetic assistance
- Reinsert tracheostomy tube if competent to do so.
- Where reinsertion cannot be undertaken i.e. no competent person, the responder must keep the stoma open using a tracheal dilator from the emergency tray.
- The dilators must be inserted in a north/south position (See Appendix 2)
- Administer Oxygen via stoma and reassure patient until help arrives.

20.1.11 Accidental Decannulation i.e. Tube falls out
In the event a patient is observed to have experienced decannulation i.e. unplanned tube removal the Responder should proceed as follows:
- Don’t Panic. Tracheostomy stoma/tract is normally well formed in 5-7 days
- Reassure the patient
- Call for help as appropriate. Consider:
  - Ward Staff
  - ENT/Max Fax team
  - Tracheostomy Safety Facilitator #538
  - Anaesthetics #889
- Reinsert new tracheostomy tube if competent to do so.
- If not keep stoma open using tracheal dilator from emergency tray - Ensure dilators are inserted in a north/south position – See Appendix 2)
- Administer oxygen via stoma until help arrives
- Monitor the patient’s oxygen saturation
- Prepare for reinsertion of tracheostomy tube.
- Ensure patient is reviewed medically post reinsertion of tracheostomy tube
- Complete and submit an adverse incident form

Tracheostomy Care Guidelines: SJH:NA(G):009: Version 4
20.1.12 Respiratory / Cardiac Arrest in a Laryngectomy Patient

20.1.12.1 Persons caring for patients with a laryngectomy must be aware that they cannot be intubated nasally or orally

20.1.12.2 Each patient who has a laryngectomy should have a Pink Laryngectomy Sign displayed above their bed. (see image below)

20.1.12.3 The sign alerts staff to the patient a ‘Neck Breather Only’

20.1.12.4 The reverse provides Laryngectomy Emergency Management Algorithm (see Appendix 10)

Pink Laryngectomy bed sign

20.1.12.5 Respiratory/Cardiac Arrest Response for a Patient with a Laryngectomy (As SJH Resuscitation Guidelines plus additional Laryngectomy Requirements)

In the event a patient is observed to have collapsed the Responder should ensure a safe approach and proceed as follows:

- Check the patient and see if he/she responds
- If unresponsive call the Cardiac Arrest Team Dial 2222
- Open the airway by:
  - Lying the patient flat
  - Removing any clothing from the neck including any stoma cover

Anatomy of a laryngectomy patient (permanent neck stoma)
- Fully extend the patient’s neck using support under the shoulders
- Assess the patient’s breathing status ensuring it is adequate i.e. breathing other than occasional gasps
- Listen and feel for air escaping from the stoma
- Watch for movement of the chest
- Establish if the patient has a cuffed tube in situ
- If yes ensure that it is inflated
- If no insert a cuffed tube (if competent to do so)
- Attach a catheter mount to the top of the cuffed tracheostomy tube
- Attach the Bag Valve Mask to 15L oxygen
- Remove mask and attach to catheter mount. (See Appendix 3)
- Administer 2 breaths (you should see the patient’s chest raise and fall)

Or

- **If no tracheostomy tube in place use the paediatric mask** with one way valve to achieve a tight seal over stoma and deliver two rescue breaths

- Assess Carotid Pulse – take for at least 5 seconds and no more than 10 seconds

- If confident that a pulse is present continue with rescue breathing providing one breathe every 5-6 seconds and reassess carotid pulse every 2 minutes

- In the event there is no pulse present commence chest compressions by
  - Placing the heel of one hand on the centre of the patient’s bare chest
  - Putting the heel of the other hand on top
  - Perform compression at a depth of 1½ - 2 inches
  - Perform compression at a rate of 100 per minute
  - Allow full chest recoil

- Continue with Basic Life Support until arrival of cardiac arrest team

- Basic Life Support requires providing 30 Compressions to 2 breaths for 5 cycles and then change / rotate compressor every 5 cycles

### 21.0 Monitoring & Auditing Procedures

21.1 These guidelines are reviewed and updated as required by the Tracheostomy Care Working Group

21.2 Compliance with the practices directed herein are routinely monitored by the Tracheostomy Care Working Group

21.3 Non or poor compliance or practice issues are addressed by the Group

21.4 All adverse incidents and/or near misses related to tracheostomies must be reported using the Hospital Adverse Incident Risk form

21.5 All reported incidents are analysed, investigated as appropriate. The implementation of any required corrective actions and/or improvements are overseen by the Tracheostomy Safety Facilitator in collaboration with Risk Management
Appendices

Appendix 1: Percutaneous Tracheostomy Insertion Procedure
Appendix 2: Picture of Tracheal Dilator/ Catheter mount / Ambu bag.
Appendix 3: Tube comparison Chart.
Appendix 4: Using Passy Muir speaking valve guide.
Appendix 5: Using Passy Muir speaking valve with ventilated patients.
Appendix 7: Cuff pressure monitoring.
Appendix 8: Tracheostomy monitoring sheet.
Appendix 9: Tracheostomy Emergency Management Algorithm.
Appendix 10: Laryngectomy Emergency Management Algorithm.
Appendix 11: Accessing Tracheostomy resources online.
Appendix 1: Percutaneous Tracheostomy Insertion - Procedure

Airway Management:

Although not necessary for the procedure, a fibre optic bronchoscope with video display is very useful and is routinely used when employing percutaneous dilatational technique in ICU. It allows for assessment of the airway before the procedure and affords the operator excellent visibility throughout the procedure, ensuring a secure airway without risk of endotracheal cuff puncture. The bronchoscope also ensures correct placement of the tracheostomy, and also allows for early identification of potential problems such as bleeding. In addition the bronchoscope affords rigid support for the trachea, reducing the risk of posterior tracheal wall perforation or tracheal ring fracture (Marelli et al 1990, Engels et al. 2009).

To facilitate the procedure the patient is administered a combination of Propofol and +/- an opioid via an IV infusion.

Full monitoring is instituted, and ventilatory parameters altered during the bronchoscopy to maintain adequate oxygenation i.e. Fio2 increased to 100%, tidal volume increased to compensate for airleak around deflated ETT cuff and the peak airway pressure alarm adjusted to allow for the raised pressures during ETT manipulation.

The patient’s eyes are taped closed and the patient is positioned with a rolled towel placed between the shoulder blades, bringing as much of the trachea as possible into the neck.

Following induction of anaesthesia, the patient is prepped and draped. The bronchoscope is passed through the patient’s endotracheal tube and the anatomy of the airway visualised. The larynx and cricoid cartilage with the intervening cricothyroid membrane are identified. From the cricoid, moving caudally, the tracheal rings are identified. The tracheostomy should ideally pass between the second and third tracheal rings, although a space one higher or lower may be employed. Placing the airway higher, next to the cricoid, can cause tracheal erosion and long-term problems.

Requirements
- Fenestrated Drape x 1
- Non fenestrated drape x 1
- Sterile gown
- Sterile gloves
- Visor facemask or standard mask with protective goggles
- Dressing pack
- Suture pack
- Griggs curved artery forceps
- Pack of gauze squares x 3
- Rolled towel
- 15mm fibre optic bronchoscope swivel connector
- Propofol infusion +/- Atracurium 50mgs in 5mls
- Local anaesthetic (Xylocaine 1% with adrenaline)
- 2% chlorhexidine 10ml antiseptic solution
- Surgical lubricant for the tracheostomy tube.
- 1x 20ml syringe, x1green, x1 orange needle
- Percutaneous tracheostomy kit, “Cook Ciagila Blue Rhino kit”
- Portex tracheostomy tube, (size 8 for a female, size 9 for a male).
- Tracheal dilator
- 500 ml bottle of sterile water(to activate lubricant on Cook Ciagila Blue Rhino kit dilator)
- Portex tracheostomy tube (size 7-8 for female, size 8-9 for a male)
- Disposable spare inner cannula
- Tracheal Dilator.
- Spare suction tubing (to apply suction to the bronchoscope)
- Size 9.0 Endotracheal tube. NB a larger endotracheal tube size 9/10 may be requested by some anaesthetists to facilitate re-intubating the patient with a larger more accessible airway. Please ensure that the ETT is checked and lubricated and that all necessary emergency equipment is available at patients bedside.
- Bag Valve Mask Device.
- Intubation tray (contents checked)
- Suction Unit
- Any Emergency drugs/fluids as requested by doctor.

Note The anaesthetic team are responsible for organising the fibreoptic bronchoscope at all times i.e delivery, documenting serial number details in the patients record and procedure book, flushing immediately after use and return of the device to theatre. This is coordinated through the technician in theatre.

PATIENT PREPARATION PRIOR TO PROCEDURE

- A blood sample for group and hold is sent to the laboratory in advance.
- Ensure an up to date coagulation screen and Haemoglobin levels are available.
- If the patient is on anticoagulants discontinue/hold 2-4 hours in advance of the procedure.
- If the patient is on Continuous Renal Replacement Therapy (CRRT) check with the Medical intensive care staff if the C.R.R.T. is to be discontinued and/or if CRRT is to continue with the anticoagulant discontinued.
- Draw bedside curtains to ensure that the patient’s privacy and dignity is preserved throughout the procedure.
- The procedure is explained in full to the patient and/or significant others.
- Consent obtained, consent form signed by the patient if possible. Discussion and verbal consent obtained from the patients Next of Kin if the patient is unable to sign and/or consent. The doctor must record this in the medical notes.
- Patient should fast for 6 hours.
- If a nasogastric feeding is in place discontinue Feeding 6 hours prior to the procedure and aspirate the nasogastric tube again immediately prior to the procedure.
- Prepare all required equipment as listed.
- Position the patient supine with a rolled towel placed between the scapula to allow for maximum extension of the neck and visualisation of the relevant anatomical landmarks.
- Ensure the head of the bed area is free from obstruction to allow ease of access to the patient’s airway by the anaesthetic/nursing team.
NURSE’S ROLE THROUGHOUT THE PROCEDURE

- Clean silver dressing trolley, using detergent and water. Wipe down with 70% alcohol wipe following washing. (Check the expiry date of solutions and packaging).
- Remain with the patient throughout the entire procedure.
- Monitor the patient’s vital signs, cardiac and respiratory status throughout the procedure.
- Assist the anaesthetist with the insertion procedure. Ensure appropriate protective equipment is worn throughout the procedure (i.e. gloves, apron, visor mask or goggles).
- Following insertion of tracheostomy tube, secure tube using the tracheostomy ties.
- Ensure inner cannula is inserted.
- Tracheostomy tube cuff pressure is checked and recorded.
- Review mode of ventilation, set tidal volume, alarm limits and Fio₂ requirements.
- Remind medical staff to flush the bronchoscope through with sterile water following completion of procedure and wipe same down using gauze.
- The medical team must record the procedure both in the ICU invasive procedure record book and on ICIP, noting patient’s medical record number, and serial number of bronchoscope used.
- Ensure post tracheostomy procedure that a chest x-ray is carried out promptly and reviewed by medical team.

PERCUTANEOUS DILATATIONAL TECHNIQUE: CIAGLIA OR BLUE RHINO METHOD

The primary requirement for performing percutaneous dilatational technique is the presence of a skilled anaesthetist for managing the patient’s airway. He/she should be equipped with the necessary instrument and drugs for rapid sequence intubation with an ETT.

- Suction the oropharynx to prevent aspiration of any collected secretions then deflate the endotracheal tube cuff and withdrawn the tube under guidance from the bronchoscope until visualisation of the cuff in the larynx. The ETT must be secured at all times and the cuff re-inflated.
- Local anaesthetic with adrenaline is infiltrated subcutaneously. Keeping in the midline at all times, advance an introducer needle with a saline filled syringe attached is advanced at 45 degrees to the skin. Entrance of the needle into the trachea is verified visually with the aid of the bronchoscope and video camera and also by aspiration on the syringe resulting in an air bubble.
- Remove the syringe and pass a “J” guide-wire is passed through the introducer needle, and then remove the needle. Then pass a small blue dilator is then passed over the “J” wire make a small incision at either side of the dilator using a scalpel.
- Remove the blue dilator and advance a white guiding catheter over the “J” wire into the trachea. Remove the “J” guide-wire and the white guiding catheter is left in the trachea.
• Pass the tracheal *blue rhino* dilator over this, gradually dilating the incision to accommodate the appropriately sized tracheostomy tube. Plenty of lubricating gel is applied to the dilator. Pass the dilator down the tract with a twisting arc type motion. Only moderate downward force is applied.

• Load the previously lubricated tracheostomy tube (cuff already checked) is loaded onto the dilator and pass the tracheostomy tube is passed over the introducer into the trachea. Once again, undue force should not be necessary; plenty of lubricant should be used. The tracheostomy tube cuff is inflated and the cuff pressure checked and recorded.

• With the tracheostomy tube in place, deflate the endotracheal tube cuff, remove the tube. Immediately remove the introducer and insert the tracheostomy tube inner cannula and connect to the ventilator.

• Primary confirmation of tube placement is performed using the CO₂ detector and by auscultating the chest for adequate ventilation. Reset alarm limits and check the ventilator for appropriate tidal volumes, FiO₂, airway pressures and alarm limits. The tracheostomy tube is secured with tapes and ties, the patient placed in a comfortable position with the rolled towel removed.

• Observe the patient carefully for evidence of respiratory distress.

• A post procedure chest x-ray is performed and reviewed as soon as possible.

**COMPLICATIONS:**
The use of the bronchoscope coupled with the expertise and honed technique of the operator have measurably reduced the incidence of complications associated with percutaneous dilatational technique and are summarised below.

• Damage/perforation of posterior wall trachea
• Accidental endotracheal extubation
• Damage to the cuff of the endotracheal tube
• Damage to the tip of the bronchoscope
• Perforation of the oesophagus
• Major haemorrhage rare
• Minor haemorrhage 0-3%
• Wound infection 0-3%
• Erythema
• Cardiac dysrhythmias
• Procedure failure 1%
• Tracheal ring fracture
• Mal position of the tracheal tube
  (Russel & Matta 2004)

**APPENDIX 2: Tracheal Dilator/ Catheter Mount / Ambu Bag Images**
1. Use of Tracheal Dilators in a North South Position

2. Catheter Mount

3. Catheter Mount with Ambu -Bag attached
### APPENDIX 3: Tube comparison Chart.

<table>
<thead>
<tr>
<th>Shileys sizes (mm) (inner cannula insitu)</th>
<th>Portex blue line ultra sizes (mm) (inner cannula insitu)</th>
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</thead>
<tbody>
<tr>
<td>Size</td>
<td>ID</td>
</tr>
<tr>
<td>4</td>
<td>5.0</td>
</tr>
<tr>
<td>6</td>
<td>6.4</td>
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<td>8</td>
<td>7.6</td>
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Appendix 4: Using Passy Muir speaking valve guide.

**USING YOUR SPEAKING VALVE**

<table>
<thead>
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<th>Patient Name:</th>
<th>Date:</th>
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- Your speaking valve may be worn all day, especially when talking and swallowing.
- Place the speaking valve on the rim of the inner cannula of the tracheostomy tube by pushing it on gently.
- Attach safety strap of speaking valve (if using a clear valve; aqua coloured valves do not have a strap) to neck strap of tracheostomy tube.
- Remove the valve by twisting and pulling gently.
- Remove the speaking valve when sleeping, even if just taking a nap (unless otherwise instructed)
- Remove the speaking valve if you are having difficulties breathing.
- Remove the speaking valve if you need to do a strong cough.
- It should be cleaned daily – swish the speaking valve in mild soapy warm (not hot) water, rinse thoroughly and let air dry.

For further information contact ______________________
(Speech and Language Therapist), Bleep ____ or Ext. 2471
Appendix 5: Using Passy Muir speaking valve with ventilated patients.

**USING A PASSY MUIR SPEAKING VALVE WITH VENTILATED PATIENTS**

**Patient Name:** [Name]  
**Date:** [Date]

- The speaking valve may be worn as tolerated, especially when talking and swallowing (if applicable). This may be for short periods initially, gradually building up to continuous use throughout the day.

- The tracheostomy tube cuff must be deflated prior to placement of the speaking valve.

- Attach the speaking valve to the connector and then attach between the closed suction system and ventilation tubing at the side for a secure connection (see diagram).

- Remove the speaking valve and connector if the patient is having difficulties breathing.

- Remove the speaking valve and connector while the patient is sleeping (unless otherwise directed).

- It should be cleaned daily – swish the speaking valve and connector in mild soapy warm (not hot) water, rinse thoroughly and let air dry.

- It should be stored in the container provided when not in use. The container should be labelled with patient’s name and date valve was first used.

For further information contact  
(Speech and Language Therapist) Bleep ____ or Ext. 2471

PASSY MUIR VALVE FITTING in VENTILATED TRACHEOSTOMY PATIENTS PROCEDURE

Prior to fitting a Passy Muir speaking valve please ensure the following:

- **Patient is alert**
- **Tracheostomy tube was inserted at least 48 hours ago**
- **All contraindications have been outruled (see list overleaf)**
- **The patient’s respiratory status is stable.** (Oxygen saturation > 92, respiratory rate < 30)
- **PEEP** less than 10
- **FiO2** less than 0.4
- **If on pressure support, less than 15**

If all of the above criteria cannot be met, do not fit a speaking valve at the present time.

If the above criteria are all met you can proceed with caution. **If fitting the Passy Muir Valve for the first time, obtain clearance for a trial of cuff deflation/PMV from medical/senior nursing staff.**

When fitting the speaking valve remember the following:

- **If fitting valve for the first time attach warning label** to the pilot balloon
- **Explain** procedure to patient as you go along
- **Suction orally** first
- **Deflate cuff** slowly while **suctioning via tracheostomy tube**
- **Monitor patient** comfort, resp rate and oxygen saturation levels. Coughing is not unusual but should settle quickly. (If patient does not tolerate deflation well, reinflate cuff)
- Assess for an **air leak** indicating that air can pass around the tracheostomy tube.
- If patient is comfortable, **fit Passy Muir valve and connector** as per diagram overleaf.
- Continue to **monitor patient** comfort. Remove valve if patient is not tolerating it well (e.g. ↑ resp rate, ↓ oxygen saturation, discomfort)
- If patient cannot produce intelligible, audible speech, **refer to SLT**.
- Patients **vary in their ability to tolerate the PMV**, and may tolerate the valve for only 5-10 minutes initially.
- **When the patient tires, remove the valve and then reinflate the cuff**.
- **Fit the valve frequently, for short periods initially. Gradually increase** patients tolerance of the Passy Muir valve.
- The valve **should not be worn while the patient is sleeping** unless indicated by medical/senior nursing staff/SLT.

CONTRAINDICATIONS FOR USING PASSY MUIR SPEAKING VALVE

- Unconscious and/or comatose patients (may be used in exceptional cases for weaning)
- Inflated tracheostomy tube cuff
- Severe airway obstruction (trauma, stenosis, granulation etc)
- Very thick and tenacious secretions
- Severely reduced lung elasticity
- Severe aspiration
- Not for use with endotracheal tubes
- Less than 48-72 hours post tracheostomy
- Post laryngectomy
- Post head and neck surgery (please refer directly to Speech and Language Therapy.)

### Placement of Passy Muir valve and connector

*PMVs should not be fitted until patient is at least 48 hours post tracheostomy*
*Check your patient does not have any contraindications for valve use*

The **cuff must be deflated** prior to placing the valve or your patient will be unable to breathe out.
APPENDIX 7: Cuff Pressure Monitoring

- If a tracheostomy cuff is inflated cuff pressure must be measured daily and recorded on the tracheostomy monitoring form.
- Ideal cuff pressure is 25cmH20 – cuff pressures can range from 25cmH20 – 32cmH20.

Procedure for obtaining cuff pressure:

1. Perform hand hygiene
2. Attach clean pressure monitor to cuff balloon and read pressure.
3. Ensure cuff pressure is within recommended limits.
4. Inflate/deflate using inflation bulb and release screw as required.
5. Document cuff pressure.

Cuff pressure monitors must be cleaned between patient use with warm water and detergent, dried and disinfected with Klorsept 17.

Note: Cuff Pressure manometer to be patient designated in critical care areas and wiped with alcohol 70% wipe between each use on patient. On discharge of patient manometer to be cleaned with detergent and warm water, dried and disinfected with Klorsept 17.
### APPENDIX 8 - Tracheostomy Monitoring Sheet

<table>
<thead>
<tr>
<th>Name:</th>
<th>MRN:</th>
<th>Ward:</th>
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<tbody>
<tr>
<td>Date:</td>
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<tr>
<td>Shiley = S Portex = P</td>
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<td>Tube Size(e.g. Size 6)</td>
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<tr>
<td>Cuffed = C NonCuffed=NC</td>
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<td>Saline Nebuliser</td>
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<td><strong>Inner Cannula</strong> Patent Y/N</td>
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<tr>
<td>&lt;25% Occluded</td>
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<tr>
<td>&gt;75% Occluded</td>
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<td>%O2 in use or Room Air (RA)</td>
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<tr>
<td>% SaO2</td>
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APPENDIX 9: Tracheostomy Emergency Management Algorithm.

Management of the tracheostomy patient with breathing difficulties - Patent upper airway

Apply high flow oxygen to BOTH the face and the tracheostomy stoma
Call for Airway Expert help – Anaesthetics/ITU AND ENT/Max Fax

Look, listen & feel at the mouth and tracheostomy
A Waters circuit or capnography may help if available

Assess patency

Yes

Is the patient breathing?

No

Remove speaking valve or cap (if present)
Remove inner tube1 (if present)
Attempt tracheal suction

Can you pass a suction catheter?

No

Deflate the cuff (if present)2
Look, listen & feel at the mouth and tracheostomy

Yes

Is the patient improving?
Eg. SpO₂ >90%,

The tracheostomy is patent
Consider partial obstruction
Continue ABCDE assessment

1. Some inner tubes need re-inserting to connect to breathing circuits
2. If bleeding from tracheostomy, await expert before deflating cuff

No

Removable THE TRACHEOSTOMY TUBE
Look, listen & feel at the mouth and tracheostomy. Ensure oxygen re-applied

Call Resuscitation team
Follow ALS algorithm
Emergency oxygenation

No

Is the patient breathing?

Yes

Continue ABCDE assessment
Support ventilation if hypoxic
Await Airway Expert

Basic emergency oxygenation

Standard ORAL airway manoeuvres
Cover the stoma (swabs / hand)
Bag-Valve-Mask
Oral or nasal airway adjuncts
LMA

Tracheostomy STOMA ventilation
Paediatric face mask applied to neck
LMA applied to neck

Expert emergency oxygenation

Attempt ORAL Intubation
DIFFICULT INTUBATION
Uncut tube. Advance beyond stoma

Attempt intubation of stoma
Small trachy tube / 6.0 cuffed ETT
Consider Bougie / Aintree catheter / Fibre-optic 'scope
This patient has a

TRACHEOSTOMY

There is a potentially patent upper airway (Intubation may be difficult)

Percutaneous / Surgical

Indication:  Difficult Airway  Prolonged Ventilation  Prophylactic Airway Management

Performed on (date) ....................................................
Trachy Tube type and size ........................................
Patient Hospital No. ....................................................

Laryngoscopy Grade & Notes on managing upper airway:

Special Instructions:

Percutaneous  Surgical

Indicate tracheostomy type by circling the relevant figure
Indicate location and function of any sutures inserted

Emergency:  ICU Reg: #889 or #666  ENT Reg/Max fax Reg/Anaesthetic Senior Reg: call switch
Mon-Fri:  Tracheostomy Nurse: #538  Staff St Johns Ward for support/advice: ext 2181
Management of the laryngectomy patient with breathing difficulties

Apply high flow oxygen to laryngectomy stoma
If any doubt about whether patient has a tracheostomy or a laryngectomy, apply oxygen to face also *

Call for Airway Expert help – Anaesthetics/TU AND ENT/Max Fax

Look, listen & feel at laryngectomy stoma
There may not be a tube inserted into the stoma
A Waters circuit or capnography may help if available

Yes
Is the patient breathing?

No

Assess patency

Remove cap (if present)
Remove inner tube (if present)
Attempt tracheal suction

Can you pass a suction catheter?

Yes

No

Deflate the cuff (if present)
Look, listen & feel at the laryngectomy

Is the patient improving?
Eg. SpO2 >90%

Yes

No

The laryngectomy is patent
Consider partial obstruction
Continue ABCDE assessment

1. Some inner tubes need re-inserting to connect to breathing circuits
2. If bleeding from laryngectomy, await expert before deflating cuff

Call Resuscitation team
Follow ALS algorithm
Assess LARYNGECTOMY patency

Partially obstructed or displaced
Continue ABCDE assessment
Await Airway Expert

REMOVE THE TUBE THAT IS IN THE LARYNGECTOMY (if present)
Look, listen & feel at the laryngectomy stoma. Ensure oxygen re-applied

Call Resuscitation team
Follow ALS algorithm
Emergency oxygenation

Is the patient breathing?

No

Yes
Continue ABCDE assessment
Support ventilation as required
Await Airway Expert

Basic emergency oxygenation
Laryngectomy STOMA ventilation
Paediatric face mask applied to neck
LMA applied to neck

Expert emergency oxygenation
Attempt intubation of stoma
Small trachy tube / 6.0 cuffed ETT
Consider Bougie / Aintree catheter / Fibre-optic `scope

LARYNGECTOMY patients have an end stoma and CANNOT BE INTUBATED via the mouth.

*Applying oxygen to the face & neck is a default emergency action for all patients with a tracheostomy.
This patient has a **LARYNGECTOMY** and **CANNOT** be intubated via the mouth

Follow the **LARYNGECTOMY** guideline if breathing difficulties

Performed on (date)........................................................
Trachy Tube type and size (if present) ............................
Patient Hospital No. ........................................................

**Note** There may **not** be a tracheostomy tube in place

If Blom Singer speaking valve dislodges contact
SALT #480 or Staff St Johns Ward ext 2181

**Emergency:**
- ICU Reg: # 889 or #666
- ENT Reg / Anaesthetic Senior Reg: call switch

**Mon-Fri:**
- Tracheostomy Nurse: #538
- Staff St Johns ward for support/advice: ext 2181

**APPENDIX 11:** Accessing Tracheostomy resources online:

Tracheostomy Care Guidelines: SJH:NA(G):009: Version 4
To access the Tracheostomy Care resources area on the SJH Learning Hub:
1. Go to https://www.hseland.ie
2. Enter your Username and Password and click Login (or select ‘create an account’ if you are a first time user of HSELanD)
3. Select Practice Development Hubs and click on the SJH Learning Hub button to launch the hub
4. Roll your mouse over the Learning Resources tab
5. Select Tracheostomy Care from the drop down menu

References


CPRC. (2003). Review of suctioning guidelines- Physiotherapy Ireland


Escambia County Health Department (2004) Policy for Tracheostomy Care and Suctioning in the School Health Setting, School Health Programme, Escambia, County Florida.


Tracheostomy Care Guidelines: SJH:NA(G):009: Version 4


Hough, A. (date??). Physiotherapy in Respiratory Care. Third edition. Cheltenham,


Open Learning Centre (2004); (ALERT) -Acute life-threatening Events-Recognition and Treatment, University of Portsmouth, Hants.


Tracheostomy Care Guidelines: SJH:NA(G):009: Version 4


Stapleton Edward, Aufderheide T, Hazinski MF, Cummins RO (2001) Basic life Support for Health Care Providers, American Heart Association


### Document Log

**Guidelines Title:** Tracheostomy Care Guidelines  

**Policy Number:** SJH: NA (G): 009  

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<th>Revision Date</th>
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<tr>
<td>Revision</td>
<td>2</td>
<td>June 2008</td>
<td>Practice Changes</td>
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<td>1. Requirement to monitor/record cuff pressure extended to tracheostomy patients on general wards.</td>
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<td>2. Management of emergency situation for tracheostomy patients on general wards updated to include the practice of removing tracheostomy tube, use of tracheal dilators, administration of oxygen and call for anaesthetic assistance in the event that the tube remains occluded following inner cannual change and suctioning.</td>
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**Format Changes**

1. Reformatted to comply with revised Policy for development & Management of Policies, guidelines etc (SJH:COR(P)::001)
2. Additional appendices developed and included i.e. Appendices 11,V1 & VII
3. References updated.
| Document Status  
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| Revision | 3 | June 2010 | **Section 7.0 Tracheostomy Tubes**
- XLT tube, cuffless removed from use Sizes 5mm removed from use
- Portex blue line ultra, size 8.5mm included
- Portex uni perc adjustable flange, non-fenestrated cuffed 7mm, 8mm, 9mm included.

**Section 12.4: Suctioning Technique**
- Suction vacuum pressure must be set at > (less than) 20Kpas
- Requirement for pre-oxygenated for ventilated patients only
- Suction technique: requirement to pull back once resistance is met altered to “approximately 15cm (roughly a pen’s length or a third of the catheter length)”.

- **Humidification**: All humidification bibs (including washable bibs) to be discarded in hospital.
- **Cuff Re-inflation**: The requirement to check inner cuff in the event of desaturation prior to cuff re-inflation

- **Cuff Pressures** (14.6): Requirement to upsize or use adjustable flange tube in the event of persistent air leak with pressures exceeding 32cmH2O
  - Instruction for cleaning pressure manometer added.

- **Swallowing** (17.1)
  - Requirement for all patients to be reviewed by Speech/Language Therapist prior to commencing oral intake identified.
  - Patient’s tolerance of speaking valve for periods of at least 15-20 mins added to criteria for dysphagia assessment.
  - Access to Sallow Chart on Carevue system noted.
  - Methodology and benefit of using a speaking valve to facilitate air flow through the larynx amended for clarification.
  - Requirement to report presence of tracheal secretions to SLT identified.
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| Revision        | 4              | December 2015 | Section 5.2 Insertion Techniques (percutaneous)  
|                 |                |               | - Update references.  
|                 |                |               | - Anaesthetists removed consultants in intensive care added.  
|                 |                |               | Section 6.0 Percutaneous Tracheostomy Insertion.  
|                 |                |               | - Update references.  
|                 |                |               | Section 8.1 Bedside equipment (Tracheostomy tray)  
|                 |                |               | - Available on St John's ward or long store room ICU added  
|                 |                |               | - Pen torch added to contents of tracheostomy tray.  
|                 |                |               | - Picture of tracheostomy tray added  
|                 |                |               | Section 8.7 Spare inner cannula.  
|                 |                |               | - Spare inner cannula - must be the same type and size as the tube that’s in place added.  
|                 |                |               | - Picture added  
|                 |                |               | Section 8.8 (added) Tracheostomy bed sign  
|                 |                |               | - Tracheostomy over bed sign (picture added)  
|                 |                |               | - Bed sign must be placed over patients bed space. (forms located in ICU/St John’s/Theatre).  
|                 |                |               | Section 9.3 Stoma care  
|                 |                |               | - If the patient has a neck flap please consult the plastics team prior to removal of tracheostomy flange sutures and fitting of neck ties added.  
|                 |                |               | Section 9.4 Procedure  
|                 |                |               | - Last bullet “otherwise Velcro ties are advocated and are less inclined to cause skin maceration to the neck” added.  
|                 |                |               | - References updated.  
|                 |                |               | Section 9.6 Cotton Ties.  
|                 |                |               | - 2. If cotton ties are required it is advised to use Velcro ties with cotton ties placed over them to help protect the skin from neck maceration. NB It is advised to use both Velcro and cotton ties on all ventilated patients in ICU.  
|                 |                |               | Section 11.3 Working Out Suction Catheter Size.  
|                 |                |               | - Formula size of tube plus 4 added.  
|                 |                |               | Section 15.1 Nonverbal Communication.  
|                 |                |               | - iPad added to high tech devices.  
|                 |                |               | Section 15.4 Benefits of Passy Muir Speaking Valve.  
|                 |                |               | - Passy Muir added in Title  
|                 |                |               | Section 15.5 Use/Care of the Speaking Valve.  
|                 |                |               | - Speaking valve should be worn for all oral trials added.  

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| Revision                                   | 4              | December 2015| **Section 16.5 Strategies to Minimize & Manage Dysphagia.**  
- “Patients can tolerate” removed.  
- of chest status for any signs of aspiration” added.  
- “Blue /food like material” added.Care vue changed to ICIP.  
- “Modified food and thickened fluids may be recommended” added.  
- “Larynx” changed to “vocal tract”  
- “SLT/Trachy nurse” added for blue dye testing.  
- “Objective assessment (VFU/FEES) may be needed to assess swallow function” added.  
- “Ongoing monitoring |
| **Section 17.0 Transferring a Patient to another Department (Added)**  
- Transferring a tracheostomy patient to another department added.  
**Previous section 17 changed to 18:Changing a Tracheostomy Tube** |
| **Section 18.8 Nurse Criteria**  
- If the patient is ventilated the feed is usually held for 4 hours before tube change “added.  
| **Section 22 Dealing with Emergencies**  
- Picture of tracheostomy bed sign/ reference and picture added.  
**Section 22.1.12.1. Respiratory/Cardiac Arrest**  
- Picture Laryngectomy bed sign added.  
| **Appendix 1**  
- Requirements: 14th bullet “Bethadine” removed “2% chlorhexidine” added.  
- Nurses role throughout the procedure bullet 10, Care Vue removed ICIP added.  
| **Appendix 9 Tracheostomy Emergency Management Algorithm and bed sign.** added |
| **Appendix 10: Laryngectomy Emergency Management Algorithm and bed sign.** added |
| **Appendix 11: Accessing Tracheostomy video resources online.** added |