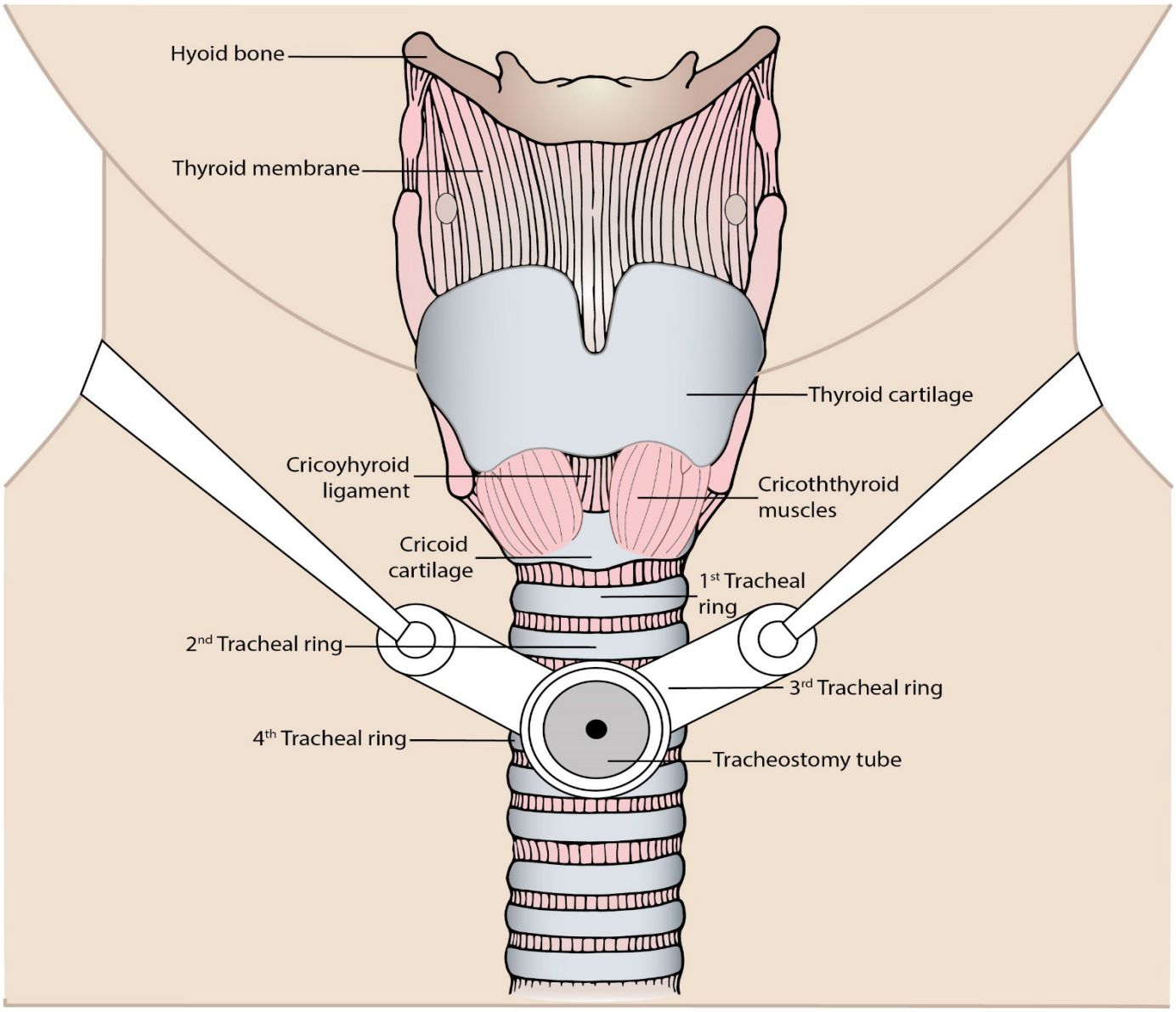

Staff Name	
Department/Hospital	
Assessor	
Competency Start Date	

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Approved by: Core Competency Group
Approved Date: 13/08/2024
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Contents Page

Introduction

This competency booklet alongside the practical element is intended to provide a structured framework for teaching staff to care for an adult with a tracheostomy whilst at hospital. The document will also provide advice to care providers who care for an adult with a tracheostomy whilst at hospital and at home. Additionally, it defines competencies that staff need, to provide safe and effective tracheostomy care.

This competency booklet is set out in two parts. The first part is a resource pack that contains information and images relating to the anatomy and care of a tracheostomy. The second part will include the relevant competencies that need to be achieved to be deemed competent. These competencies must be signed by a competent registered nurse. The back of this booklet are details outlining the competency scale rating: Stage 3 ‘Competent’ is the minimum requirement.

Glossary

The following terms and abbreviations have been used within this competency document:

Term	Definition
ANTT	Aseptic non touch technique
DOPE	Displacement, Obstruction, Pneumothorax/Pneumonia and Emergency equipment method
HME	Heat moisture exchanger
PPE	Personal protective equipment
PVC	Polyvinyl chloride
RR	Respiratory rate

-

Part 1 – The Resource Pack

What is a tracheostomy?

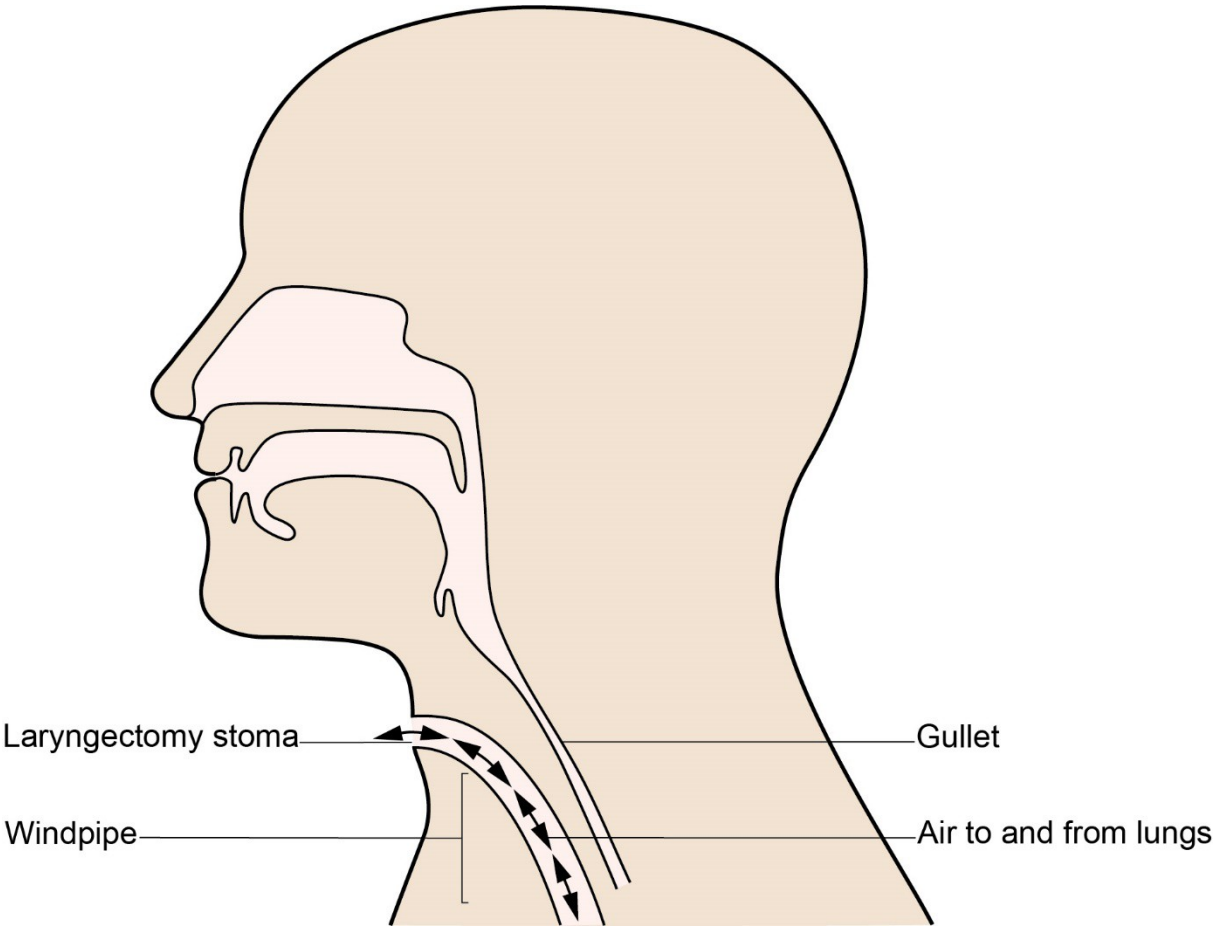
A tracheostomy is a surgical opening between the second and forth tracheal (windpipe) rings to assist with ventilation; the opening is usually maintained using a tracheostomy tube. The procedure may be performed either surgically or by a percutaneous method (needle puncture of the skin). The percutaneous method is generally done in critical care.

Tracheostomy tubes are inserted for adults who have an airway problem causing breathing issues. This may be due to a number of different issues such as: laryngeal new growth, foreign body, burns, anaphylaxis, surgical oedema, neuro disorders or prolonged ventilation. A tracheostomy may be permanent or temporary.

A tracheostomy is an artificial airway so there is a risk of it blocking or the tube becoming dislodged therefore **an adult with a tracheostomy must be cared for by someone who is trained and competent in tracheostomy management.**

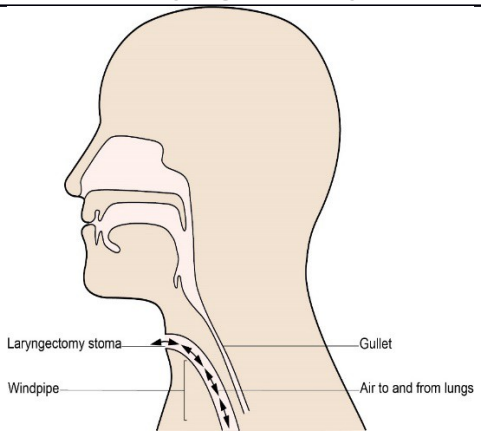
What is a laryngectomy?

A laryngectomy is the surgical removal of the larynx performed mainly due to cancer and it involves removing the larynx and pulling the trachea to the edge of the skin and creating a permanent opening in the windpipe (“stoma”) as the only way to breath.



After having a laryngectomy, a tracheostomy tube will be inserted for a short time to maintain the airway from swelling and to prevent any blood from the operation going into the patients lungs. The laryngectomy is a permanent procedure by removing the larynx the airway and oesophagus (food pipe) become completely separate meaning that during an emergency the only way to ventilate the patient is through the stoma in their neck. Due to the cartilage from the trachea the stoma should keep patent and not close like a tracheostomy patient would, but the same daily care is required making sure the patient is hydrated and well humidified and that the stoma is inspected and cleaned regularly.

Tracheostomy v Laryngectomy

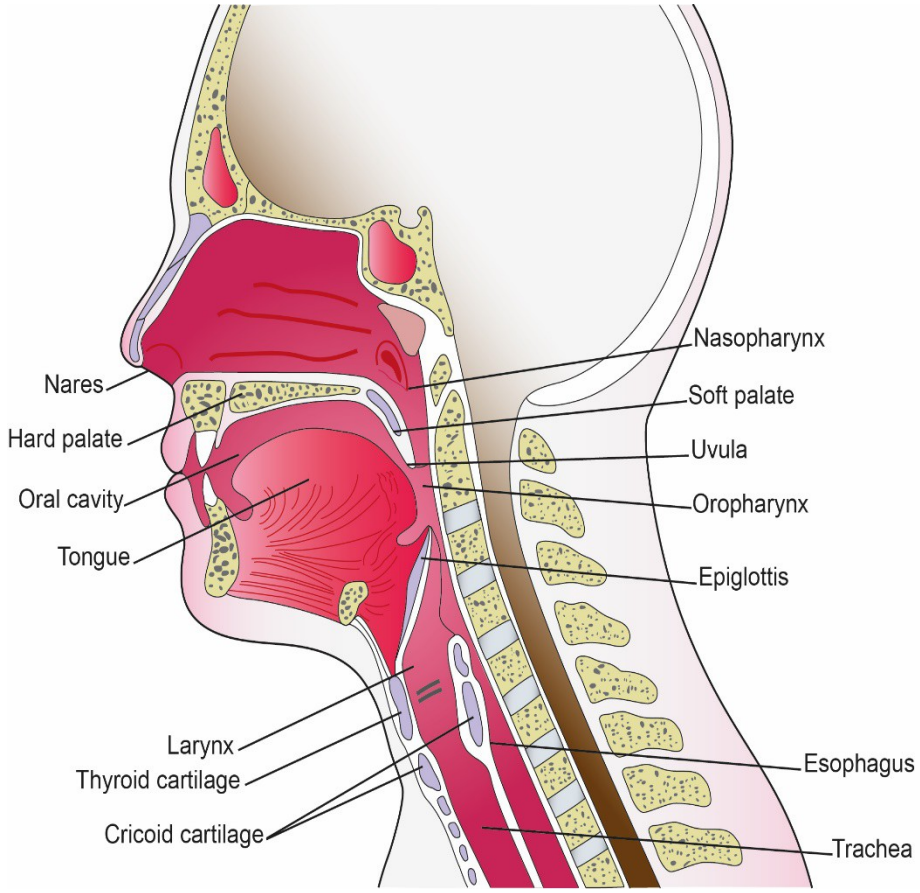
Laryngectomy	Tracheostomy
	
• Permanent procedure • May have a tracheostomy tube in place but might not as stoma can maintain without the need for a tube. • Lungs no longer attached to mouth and nose. • Must be oxygenated or ventilated by neck stoma only. • Laryngectomy surgery not reversible.	• Reversible procedure • Tracheostomy tube always in place. • May have a patent upper airway depending on the need for the tracheostomy. Possibly able to ventilate using upper airway check in notes for airway patency.

Anatomy and physiology

The upper airway consists of the nose, mouth, throat, and larynx (voice box). Air is warmed, moistened and filtered in the mouth and nose. The throat divides into the trachea (windpipe) and oesophagus (food pipe). There is a small flap (epiglottis) that closes over the windpipe to stop food entering it. The larynx is where sound is generated. It also helps protect the trachea by producing a cough reflex if any objects pass the epiglottis.

The lower airway consists of trachea (windpipe) which divides into two bronchi one going into the right lung and one into the left lung; these divide into smaller airways called bronchioles at the end of which are little sacks called alveoli.

The main function of the respiratory system is to take oxygen into the body and to remove carbon dioxide which is exhaled via the lungs.



Respiratory Humidification

Having a tracheostomy bypasses the normal healthy functioning upper airway which is used to keep air warm and moist by passing air through the nose, mouth and trachea with 75% of humidification done by the upper airway, with a tracheostomy tube the whole upper airway is no longer used reducing humidification by 50%.

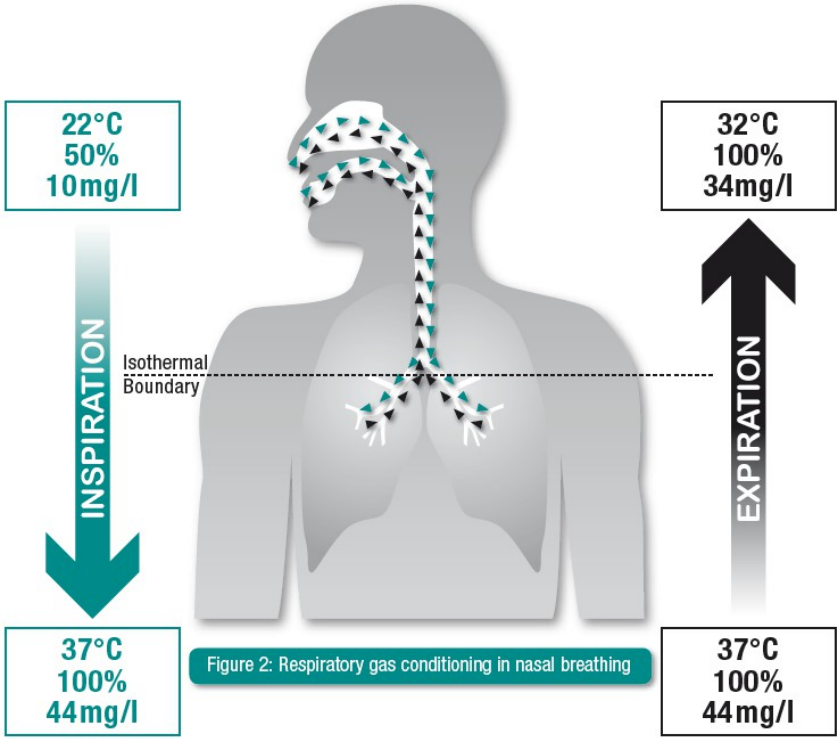


Fig 1: Isothermic reaction, WILAmed GmbH, 2014

In the lower respiratory tract after the air has been humidified the air is conditioned further until Isothermal saturation limit is reached. The isothermal limit means the best possible humidification which is 100% at 37^{c}. The co –ordinated movement of the cilia transports the mucus together with foreign matter towards the mouth and coughed up, optimum clearance requires an optimum temperature of 37^{c}.

Lack of humidification will cause increased viscosity of mucus secretions which depresses ciliary function which in turn can lead to sputum plugs causing tube blockages and a risk of infection (Tracheitis) which requires humidification therapy. This is why regular saline nebs are important to maintain optimal cilia movement.

The larynx

The Larynx, or voice box, is the opening of the trachea where it meets the pharynx. Its profusion, with the thyroid cartilage, can be seen in the exterior of the throat, and is commonly called the “Adam’s apple”. The larynx serves to close off the trachea during swallowing so that food is not admitted into the airway and facilitates swallowing by moving against the back of the tongue. Containing the vocal cords, the larynx also enables vocalisation by manipulating these cords to vibrate at a desired pitch when air is passed through the Larynx. Three cartilaginous structures comprise the Larynx:

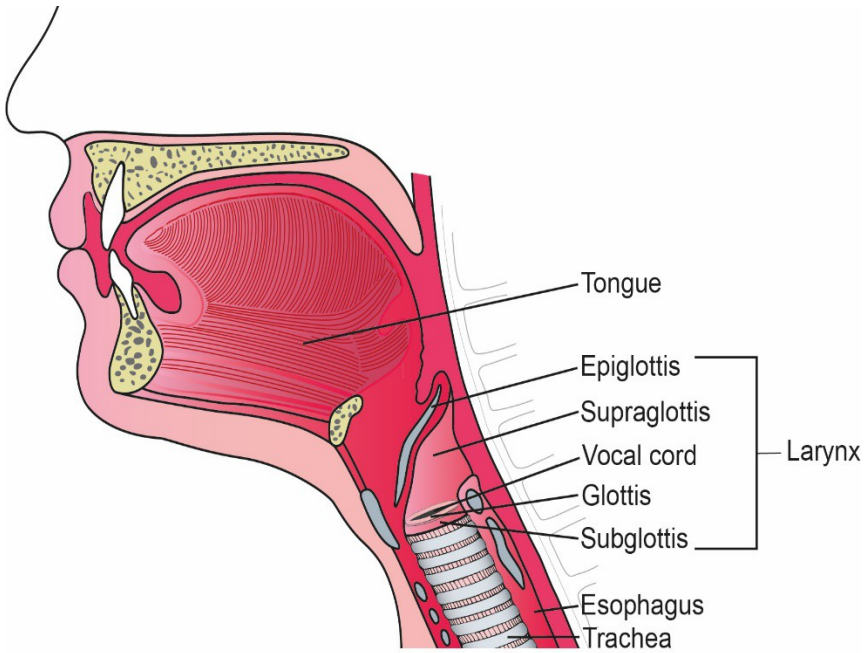
The Cricoid

The Epiglottis

The Thyroid

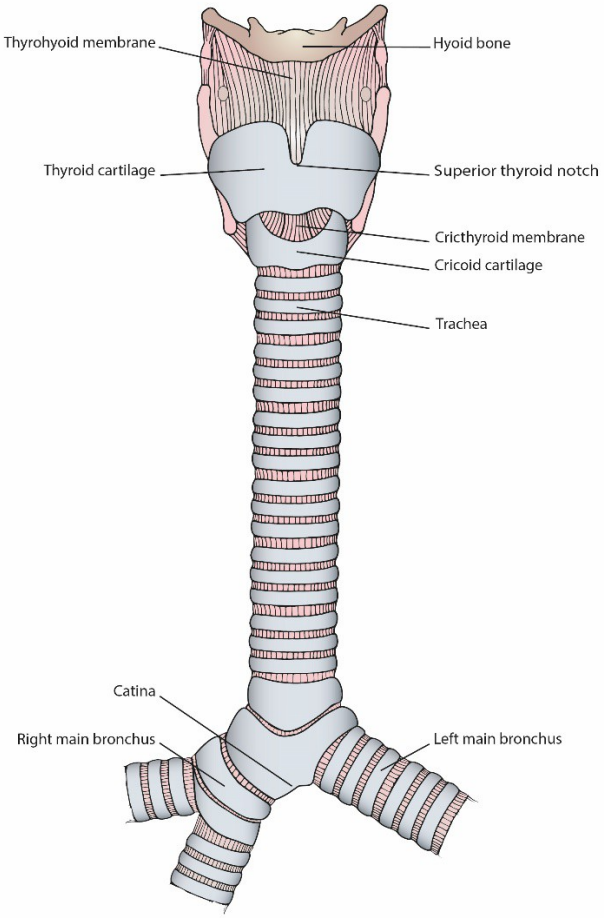
The circular cricoid cartilage serves to reinforce the head of the trachea to keep the airway open. The flap-like epiglottis helps to shut off the airway during swallowing, as it swings down to meet the upraised larynx to prevent food from entering the trachea. The thyroid cartilage forms the bulk of the structure of the larynx, anchoring the epiglottis by means of the false vocal cords, and by anchoring the true vocal cords to the vocal processes of the arytenoid cartilage of the glottis.

The pitch of the voice is highly dependent upon the elasticity and tension in these true vocal cords. When the angle of thyroid cartilage decreases in males during puberty, the tension on the vocal cords diminishes in a lower voice.



The trachea

The trachea, or windpipe, is the upper section of the airway, separated from the pharynx by the larynx. It is composed of the ribbed cartilage, which extends about four inches down to the bronchi of the lungs. Resting flatly against the oesophagus, the trachea can extend slightly during swallowing, breathing, or bending the neck. It is lined with a mucous layer and cilia, which help to filter out dust. The constant action of these cilia carries mucous and debris upwards into the pharynx, whereupon it is swallowed. When the upper trachea or pharynx become blocked so as to cut off the airway, as from swelling of the tissues, a small incision is made in the throat and into the trachea, in an operation called a tracheostomy, which allows air to pass into the windpipe.



Cillia

The cilia are tiny microscopic hairs, which protrude from the walls of cells lining the respiratory tract. These cells are interspersed with goblet cell, which produce mucous, coating the lining of the respiratory tract.

These hairs help eliminate dust and infectious agents from the air that is breathed in before they reach the respiratory tract. Constant peristaltic ciliary's action carries these particles which are trapped in the sticky mucous secretions to the nasopharynx, where they are swallowed into the stomach or coughed out.

The cilia are also important to the sense of smell. Each hair terminates in a small smell receptor known as an olfactory receptor. It is believed that these receptors are sensitive to about 30 primary smells. Other smells are made up of mixtures of some or all of these primary smells. When odorous substances activate the cilia, the receptors respond by firing off a series of nerve impulses to the brain for interpretation.

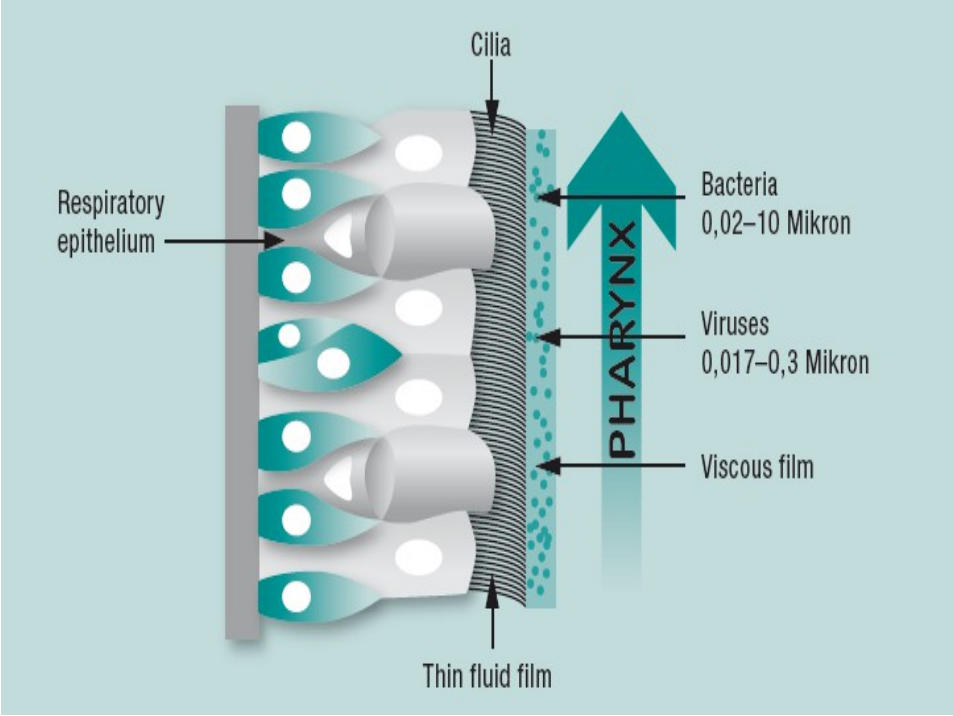
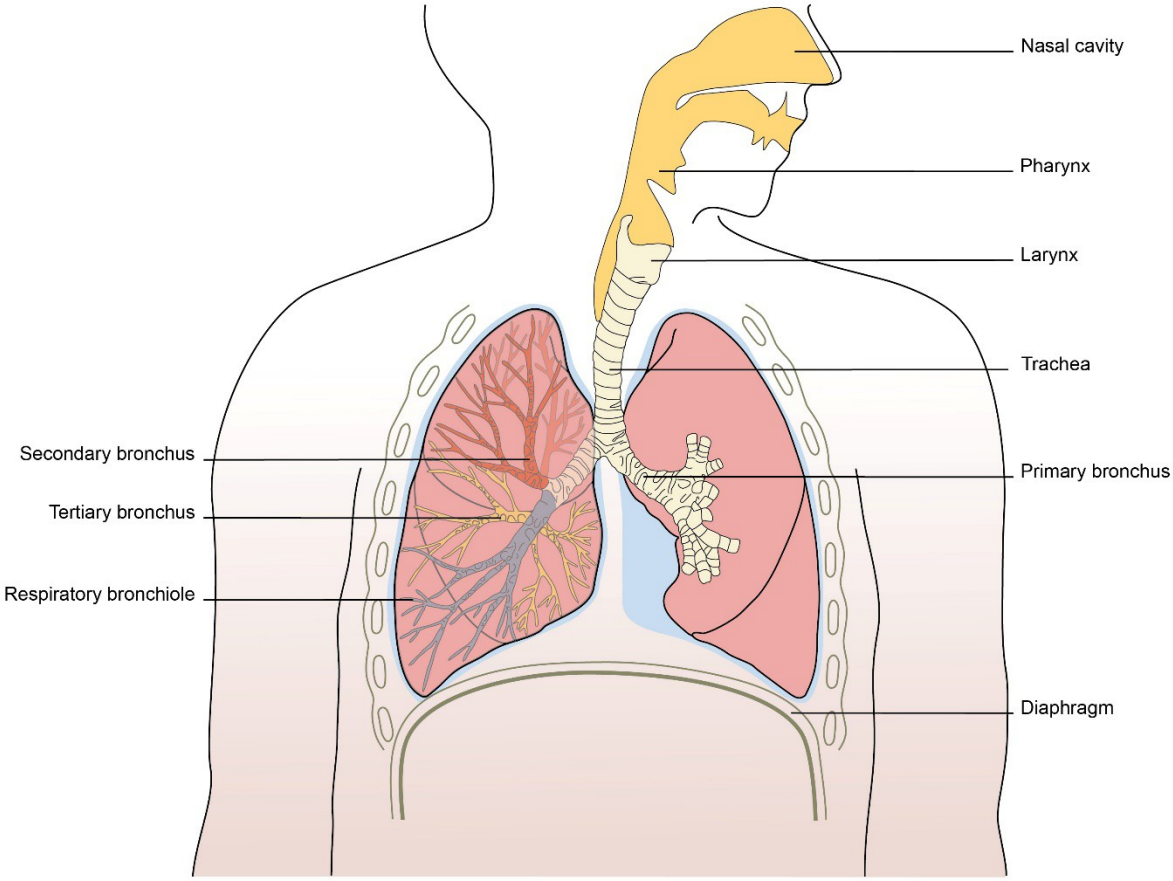


Fig 2: Cillia, WILAmed GmbH, 2014

The Lungs

The lungs are two sponge-like sacs, which expand with diaphragmatic contraction to admit air, and which house the alveoli where oxygen and carbon dioxide diffusion reoxygenates blood cells. The right and left lung feature fissures, which divide the overall structures into smaller lobes. The left lung (the body's left, the viewer's right) has one horizontal fissure, which divides it into two lobes (upper and lower). The right lung has one horizontal fissure and one oblique fissure, dividing the right lung into three lobes (upper, middle, and lower). Because of this third lobe, the right lung is larger than the left, extending further down in the abdominal cavity.

The right and left lungs are enclosed in a pleural sac and are separated by the mediastinum, a membrane that extends from the vertebral column in the back to the sternum in front. Each half is anchored by the mediastinum and rests on the diaphragm below. The medical surface of each half features an aperture, called a hilus, through which the bronchus, nerves, and blood vessels pass. The bronchi lead to narrower subdivisions, called bronchioles. These, in turn, branch off the alveolar ducts, which lead to grape-like clusters of alveoli in the alveolar sacs.



The lungs and circulation

Deoxygenated blood is pumped to the lungs from the heart through the pulmonary artery. This artery splits to go to each lung, subdividing into arterioles and metarterioles deep within the lung tissue. These metarterioles lead to networks of smaller vessels called, capillaries, which pass through the alveolar surface.
The blood diffuses waste carbon dioxide through the membraneous wall of the alveoli and takes up oxygen from the air within. The reoxygenated blood is then sent to metavenouoles and venuoles, which are tributaries to the pulmonary vein. This vein takes the reoxygenated blood back to the heart to be pumped throughout the body for nourishment of its cells.

The Bronchi and bronchioles

The bronchi are the tubes, which carry air from the tracea to the inner recesses of the lungs, where it can transfer oxygen to the blood in small air sacs called alveoli. Two main bronchi, the right and left bronchus, branch off the low end of the trachea in what is called tracheal bifurcation, one bronchus extends in to each of the right and left lung.

The bronchi continue to divide into smaller passageways, called bronchioles, forming a tree-like network of branches, which extends throughout the spongy lung tissue. The exterior of the bronchi are composed of cartilaginous, elastic fibre and feature annular reinforcements of smooth muscle tissue. The bronchi are able to distend during inspiration to allow the lungs to expand, and contract during expiration as air is exhaled.

The bronchioles are the intermediate air passages within the lungs. They branch off of the large bronchi and extend to the smaller branches of the alveola ducts. Each respiratory bronchiole subdivides into five or more alveolar ducts. The structure of the bronchi , bronchioles, alveolar ducts and alveoli is often called the “bronchial tree” because its extensive branching resembles the limbs and leaves of a tall deciduous tree.

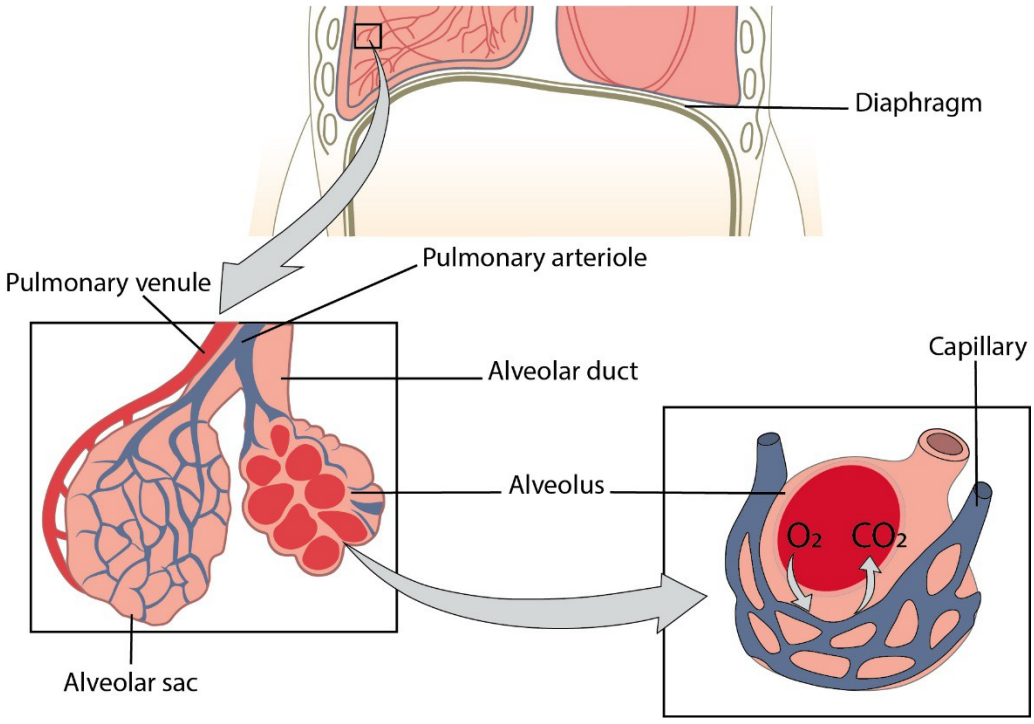
The Alveoli

The alveoli are the tiny sacs at the ends (or “leaves”) on the bronchial tree. Each small bronchiole divides into half a dozen or so alveolar ducts, which are the narrow inlets into the alveolar sacs. Each alveolar duct subdivides, leading into three or more alveolar sacs. Each large alveolar sac is like a grape cluster, which contains ten or more alveoli.

Because the membrane separating the alveolus and the capillary network, which carries blood over them, is very thin around 0.5nm, and semi permeable, oxygen can diffuse from the air into the blood cells within the capillaries. Likewise, carbon dioxide and other waste gases can diffuse out of the blood and into the air to be exhaled by the lungs.

The alveoli are made up of several types of cell, some are responsible for the removal of infectious agents and foreign particles, whilst others secrete surfactant which lowers the surface tension of the alveoli, allowing increased compliance of the lung, and therefore reducing the amount of effort needed to inflate the lung on inspiration.

The alveoli are particularly susceptible to infection, as they provide bacteria and viruses with a perfect place to grow. This accounts for the tendency for a chest cold or other lung problem to advance into pneumonia and pneumonitis, both potentially dangerous conditions, in which the inner most parts of the lungs become infected and inflamed, diminishing air flow and oxygen transport.



Eating and drinking

Most adults will have no problems eating; however, some may experience difficulties. It may be hard to swallow saliva or cough. If any signs of aspiration are noticed, (food or fluid entering the lungs), for example if there is coughing during or after drinking, or drink comes out of the tracheostomy, then the patient should not have anything by mouth and should be assessed by a speech and language therapist. Post laryngectomy the patient will be unable to eat orally until a barium swallow has been completed to check for any leak which is usually two weeks post-surgery.

Communication

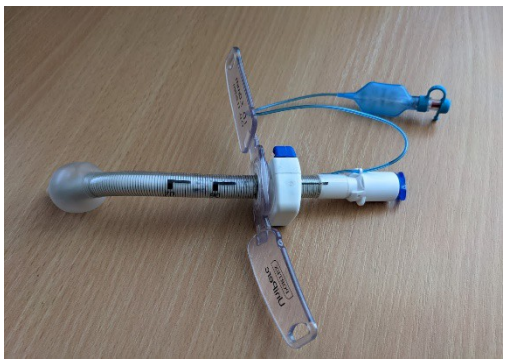
Sound is generated when air passes up through the larynx. In an adult with a cuffed tracheostomy tube the air comes out of the tracheostomy tube so does not go through the larynx unless there is a leak around the tube. Laryngectomy patients need a communication aid to enable them to communicate such as a speaking valve put in during surgery or later or an electro-larynx device. Using a pen and paper or whiteboard is essential to begin with to aid communication.

Speaking valves

A speaking valve is a one-way valve that sits on the end of the tracheostomy tube. Speech valves are important part of the weaning process placing them on the end of a tracheostomy tube with the cuff down the valve opens on inspirations and closes on expiration which directs the air up through the larynx enabling speech. This is not suitable for all adults and requires assessment by the Tracheostomy Specialist Practitioner and Speech and Language Therapist to assess suitability prior to use.

Types of tracheostomy tubes

There are many types of tracheostomy tubes all with different benefits below is a list of the tubes that we commonly see.

Tube	Information
Portex™ tube 	• Most commonly used tubes. • Comes is a variety sizes from 6 – 10. • Tubes can be supplied with a cuff or without and with or without a suction aid. • Flexible rubber flange for comfort. Comes with inner cannula.
Tracoe twist™ 	• Come in a variety of sizes 4-10 • Twist mechanism to secure inner tube. • Tracoe twist plus can provide a longer tube is needed. • Flange swivels to provide comfort when tube is in use. • Can come with or without a cuff. • Can come with or without a suction aid. • Comes with inner cannula.
Adjustable flange tracheostomy tube (UNI-PERC) 	• Suitable for patients with up to 50 mm of pre-tracheal soft tissue. • Flexible flange for comfort. • Can come with a cuff or without • Can come with a suction aid. • Due to length of tube and being able to adjust the length it is good for patients with a bigger neck. • Comes with inner cannula.

Tube	Information
Silver Negus Tube 	• Tube no longer produced but still in use by some patients. • Tubes only come cuff less • No direct connection for equipment such as HME so alternatives e.g. bib to be used. • Due to no connection tube sits flush in neck. • Inner tube in place, one with speaking valve built in. • Silver to aid with infections.
Laryngectomy tube 	• Flexible tube • Comes in different lengths and width. • No inner cannula. • Temporary tube usually for a new laryngectomy.

Humidification aids

A Heat Moisture Exchanger (HME) is a device fits onto the end of the tracheostomy so that air passes through this before going into the windpipe, this also allows the air to warm and moisten. Other methods are regular saline nebulisers and room humidifiers. These are used to maintain good humidification for the patient to maintain good isothermal saturation.

Humidification Aids	
Thermovent T™ (Swedish Nose) 	Saline nebuliser 
TrachPhone™ 	Buchanan Bib™ 
Laryngectomy HME button 	Airvo™ (Warm humidified air) 

Suctioning via a tracheostomy

Airway suctioning is undertaken to remove secretions from the respiratory tract. An adult with a tracheostomy may find it hard to clear the secretions effectively and therefore suctioning is an essential part of their care. Suctioning should only be performed by personnel trained and competent in the procedure.

<table>
<tr><th>Equipment required</th><th>Indications for suctioning</th></tr>
<tr><td>

Uni-medical™ centimetre marked suction catheters of the correct size.
Suction unit with variable vacuum control (wall/portable).
Personal protective equipment including fluidsheild mask.
Bowl for sterile water (Replace every 24 hours) mark with date.
Bottle of sterile water (Replace every 24 hours) mark with date.
Clinical waste bag.

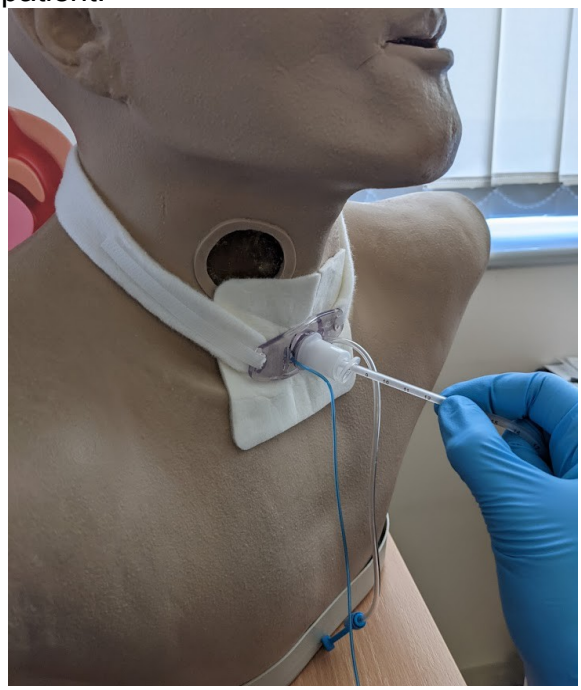
</td><td>

Noisy breathing.
Irregular respiratory pattern.
Prolonged expiratory breath sounds.
Ineffective cough.
Copious secretions, bubbling in tube end.
Respiratory distress.
Cyanosis/fall in SaO_2.

</td></tr>
<tr><th>Preparation/suction catheter size</th><th>Suction pressures</th></tr>
<tr><td>

Explain the procedure to the patient and/or carer and obtain informed consent.
Check equipment such as suction machine or wall suction is working and the chamber isn’t full.
The correct marked suction catheters should be used with fingertip control and side eye port.
Ensure correct catheter size by using the equation -2X2
Make sure to adhere to the hospital policy on hand hygiene (Trust Docs ID: 613) and PPE (Trust Docs ID: 588) making sure to wear a Fluidsheild mask while suctioning.

</td><td>
<table>
<tr><th>Tube size</th><th>Suction Catheter Size</th></tr>
<tr><td>6.0</td><td>10 CH</td></tr>
<tr><td>7.0</td><td>12 CH</td></tr>
<tr><td>8.0</td><td>12 CH</td></tr>
<tr><td>9.0</td><td>14 CH</td></tr>
</table>
</td></tr>
</table>

Procedure	Assesment of child
• Make sure to wear non-latex gloves and adhere to Aseptic non touch technique (ANTT). • Insert appropriate size suction catheter at a steady rate to the required depth 11 cm if patient can expectorate, 16 cm for 'deep' suctioning if patient cannot expectorate. • Do not apply suction on insertion. The procedure should be a non touch technique so only handle the proximal end. • While withdrawing the catheter apply suction for no longer than 5- 10 seconds. • Observe aspirate colour, quantity and consistency and take appropriate action. increase/decrease humidification. • Suction catheters should only be used once then discarded. • This is a tiring procedure for the child recovery time is needed before repeating and monitor SATS during procedure.	Assessment of the patient is important to understand what is normal for that person and important for understanding if there is any changes in the patient's condition. • Check SATS/RR • Check that the current tracheostomy tube is patent. • Observe breathing • Indications for changes in condition: • Altered chest movement • Increased respiratory rate • Altered texture or volume of secretion. • Increased heart rate. • Altered colour or temperature of the patient. 

Risks
• Hypoxia (inadequate oxygen reaching body tissue). • Infection. • Formation of granulation tissue/ ulceration • Cardiovascular changes (changes in heart rate/rhythm). • Pneumothorax (collapsed lung). • Atelectasis (collapsed airway sacs). • Intracranial changes (changes in brain pressure).

Cleaning,dressing and collar changes

Changing of the tracheostomy dressing and collars should be done every 24 hours as long as there is no strike through before and is part of the standard care of the tracheostomy.

Equipment required	Indication for change
• Bedside Emergency equipment • Dressing Pack or aseptic tray. • Gauze swabs and Saline sachets • Adult standard collar. • Trachi-dress dressing • Round ended scissors • Suction equipment • Gloves and apron • Fluidshield face mask with visor	• Every 24 hours collar and dressing change. • If the tape or dressing is visibly soiled. • Changing of tracheostomy tube. 
Preparation	**Risks**
• Make sure correct equipment is in place. • Check that the suction machine and oxygen is working correctly and the suction container doesn't need emptying. • Explain the procedure to the patient and obtain informed consent. • Adhere to hospital policy on hand hygiene (Trust Docs ID: 613) and PPE (Trust Docs ID: 588). • Ascertain if the any analgesia is needed prior to procedure. • Prepare a dressing pack observing ANTT with all the required equipment.	• Skin breakdown if wet dressing and tape left on for too long. • Pressure sores caused by the tube. • Infection if dirty dressing and tape left on. • If stoma is not observed visually then signs of infection or other concerns such as over granulation could be missed. • Displaced tube as a result of dressing or collar change.

Dressing and tape change guidance

- If the tapes are to be renewed or loosened/tightened, this is a **two-nurse procedure**. One nurse should perform the tape change, and the other nurse should be responsible for the holding of the tube and maintenance of the oxygen supply when delivered.
- If there is no “seep through” when assessed each shift, the dressing and tapes should still be changed 24 hourly, or more frequently if there is seep through, for patient comfort and to allow inspection of the stoma site and neck.
- Wash your hands (Hand Hygiene Policy Trust Docs ID: 613) and wear the correct PPE (Personal Protective Equipment Policy Trust Docs ID: 588).
- Prepare a dressing pack observing ANTT.
- Ensure patient is in a suitable position for the change hyper extending neck if needed.
- Prepare collar ready for change.
- With the second person supporting the tube, remove old collar.
- Remove the soiled dressing and discard
- If the stoma shows any clinical signs of infection, swabs should be taken for microscopy, culture and sensitivity prior to cleaning.
- Clean around the stoma site with 0.9% normal saline and non-lint type gauze and dry area well (never use cotton wool). Check for signs of pressure sores around the neck and in the creases.
- If the skin around the stoma site is sore or excoriated, barrier creams suitable for use in this area may be used e.g. Cavilon.
- Reapply a dry, absorbent sterile dressing e.g. Trachi-dress™ (shiny side to the skin). Avoid using bulky substitutes as these may pull the tube away from the neck precipitating accidental decannulation/displacement.

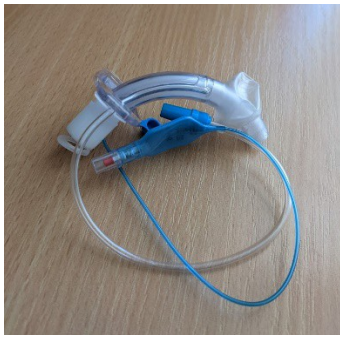
The main type of collars used for securing adult tracheostomy tubes comes in two parts as pictured below.

Inner cannula and cuff care

Changing the inner cannula and checking the cuff pressure on the cuffed tracheostomy tube is part of the routine care of a tracheostomy. The inner cannula acts as another safety mechanism to maintain the patency of the tube without having to replace the whole tube. Checking the cuff pressure is important to make sure the cuff is maintaining inflation and also that it is not over inflated. It is also important to check the suction aid to remove any secretions sitting on top of the balloon giving which can aid with the weaning process.

<table>
<tr><th>Equipment required</th><th>Indication for Inner cannula change</th></tr>
<tr><td>

Spare same size inner cannula
Sterile bowl (changed every 24 hours)
Sterile water (changed every 24 hours)
Tracheostomy cleaning brush
Working suction wall/machine
Cuff pressure manometer
Correct PPE
10 ml syringe


Tracheostomy cleaning brush

Blue line with the pilot balloon
</td><td>

Noisy breathing
Irregular respiratory pattern
Prolonged expiratory breath sounds
Ineffective cough
Copious secretions, bubbling in tube end
Respiratory distress
Cyanosis/fall in SaO_2
Part of routine care at frequency documented.

Indication for cuff pressure check and suction aid aspiration
Cuff pressure

Two times per shift beginning and end.
If any concerns with balloon deflation e.g.
increased coughing
Voice when balloon should be up
Visible deflation of pilot balloon.

Suction aid aspiration

Usually 2 – 4 hourly to begin with usually the same frequency as inner tube changes.
Prior to deflating the cuff.

</td></tr>
</table>

 Manometer	

Inner cannula procedure

- Assess indication for inner cannula (tube) change.
- Ensure relevant equipment is ready.
- Adhere to hospital policy on hand hygiene (Trust Docs ID: 613) and PPE (Trust Docs ID: 588).
- Remove current inner tube by bracing the outer tube and pulling the ring pull on the inner tube it will unclick as it is pulled out and then put it in the sterile bowl.
- Insert the clean inner tube while bracing the tube until an audible click is heard.
- Clean the dirty tube with sterile water using the tracheostomy cleaning brush, passing the brush through the tube and but not scrubbing it back and forth.
- If the inner tube is sticky and hard to clean ensure correct humidification is in use.
- Do not leave the inner tube in the sterile bowl with the water as this will grow bacteria. So suction the remaining water in the bowl to keep it dry.

Cuff pressure and suction aid aspiration procedure

Cuff pressure

- Assess indication for checking the cuff pressure on the tube.
- Adhere to hospital policy on hand hygiene (Trust Docs ID: 613) and PPE (Trust Docs ID: 588).
- Connect manometer to the blue line with the pilot balloon on the end as seen in the diagram above.

- Ensure it is between 21- 31 cmH2O on the manometer it is shown with a green visual range.

Suction aid aspiration

- Assess indication for checking the cuff pressure on the tube.
- Adhere to hospital policy on hand hygiene (Trust Docs ID: 613) and PPE (Trust Docs ID: 588).
- Connect the 10 ml syringe to the suction aid which is the clear line with the blue end as seen in the diagram above.
- Aspirate with the syringe until you have removed all the secretions that you can.
- Monitor and record the amount and take note of any changes in colour for instance blood.

Changing a tracheostomy tube

The decision to change the tracheostomy tube, and the choice of tube to be inserted, will be based upon many factors. Such considerations are:

- the need for positive pressure ventilation / continuous positive airway pressure,
- the risk of aspiration of gastrointestinal contents or oral secretions possibly causing a chest infection.

The choice of tube will therefore be a multi-disciplinary decision.

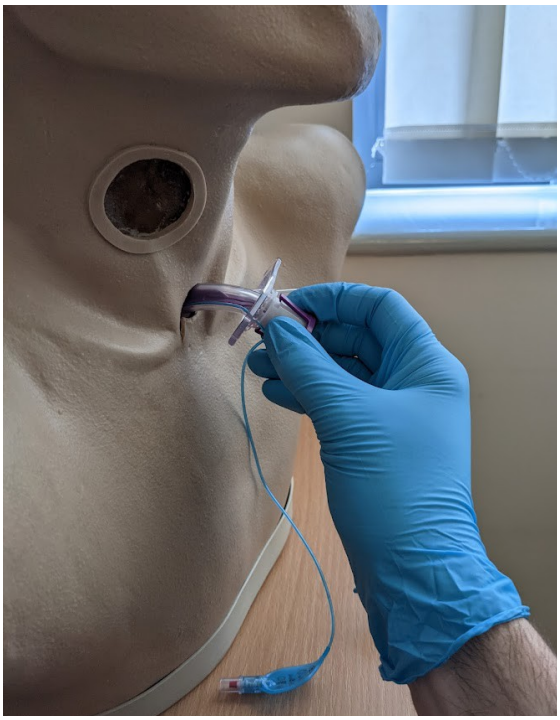
Tracheostomy tube changes carry significant risk, complications associated with tube changes usually occur when there is inadequate preparation of patients and facilities (Russell and Matta 2004). Careful consideration must be given to how the tracheostomy was performed and when. It is advisable to wait 7 days before the first tube change and certainly within 48 hours of the procedure it is unlikely that a clear tract has been formed.

Percutaneously formed tracheostomies, have the potential to be more challenging in the early stages due to stoma shrinkage as the tube supporting the stoma is removed (Russell and Matta 2004). A bougie or percutaneous guide wire may be helpful in these circumstances; this should be available in the Tracheostomy Safety Box.

Tube changes should only be performed by staff who are competent to do so, who have a clear understanding of why the tracheostomy has been formed, with a clear knowledge of any complications that may arise during the procedure or subsequent tube changes. The practitioner must know how to deal with any of these complications and whether emergency intervention is required.

Where acute deterioration in a child with a tracheostomy is encountered, and a change of tube may be required, consider using the (DOPE) Displacement, Obstruction, Pneumothorax/Pneumonia and Emergency equipment method of assessing the cause. CONTACT 2222 IMMEDIATELY.

Tube change guidance	
Indications for <u>Emergency</u> tube change	**Indications for <u>Routine</u> tube change**
• Blocked tube • Misplaced or displaced tube • Cuff failure • Faulty tube • Resuscitation	• Facilitate weaning/speech production • Maximum recommended time in situ. (On average 4 weeks) • Increase patient comfort • To allow non-routine cleaning and dressing of a tracheostomy wound • To allow treatment of granulation tissue at stoma site.
Equipment needed	**Preparation (Routine)**
• Gloves and apron • Dressing pack • Gauze swabs • Tracheostomy dressing • Tracheostomy tube of the same size, length. • Lubricant jelly • New tracheostomy collar. • Normal 0.9% Saline. • Functioning Suction Unit • Correct sized suction catheters • Emergency equipment – Tracheostomy Safety Box • Adult Ambubag • 10 ml LL syringe.	• This is a **two-person procedure**, and again, ANTT personal protective equipment must be adhered to (Trust Docs ID: 588). • Explain the procedure to the patient and obtain informed consent wherever possible. • Ensure that the equipment is available and in working order. • Ensure patient is in a good position hyper extend neck is necessary. • Prepare collar pre-secure on tube if required.

Procedure (Routine)	Preparation (continuation)
• Using a small amount of lubricant lightly coat the end and curve of the tube and introducer tip. • Assess indications for suctioning, pre oxygenate if required. • Check inner cannula and replace with clean one (in an emergency changing the inner cannula can rectify the problem). • Perform synchronised cuff deflation by suctioning at the same time as the other nurse deflates the cuff. • Remove the tracheostomy collar and dressing. • The second nurse should support the unsecured tube and hold the new tube once inserted until the tube is deemed to be in a correct position a collar reapplied securely. • Remove the tube using a “curved”, downward motion. • Clean and dry stoma site, clear tract should be visible, observe for signs of infection or over-granulation. Remove any stoma sutures if 7-10 days post tracheotomy formation. A pen torch is useful for assessing the stoma appropriately. • Insert the new tube with a forward and downward curved motion; remove the introducer <u>immediately</u> once the tube is fully inserted. • The assistant should then take over and hold the tube in position. • Re-apply the tracheostomy dressing and collar (Collar secured with a 2 finger gap) ensuring that the site is clean and dry applying any creams to neck and stoma as required.	• Assess the patient by monitoring saturations during procedure. This may be indicated in those with copious secretions, high flow oxygen, periods of desaturation especially during suctioning. • Wash your hands • Open a dressing pack and place the appropriate items from above list upon it. • Remove the introducer from the new tube, re-insert it and repeat until ease of removal is ascertained. • Check size of new tube is correct. • Check available inner cannula. 

Assessment
• Observe oxygen saturations. • Observe chest movements. • Respiratory rate and comfort of breathing. • Feel for air movement at the tube opening.

Emergency care

There are many potential problems that can occur with a tracheostomy tube. The main causes of emergency situations are listed using the acronym DOPE as shown below:

D	**Displacement** – Caused by a dislodged or damaged tube. Does the tube look in the correct position; is it sitting flush to the neck and central?
O	**Obstruction** – Anything blocking the tube e.g. Blood, secretions. Is there any air coming out of the tube?
P	**Pneumothorax** – Pulmonary problem. Is there any trachea deviation and equal rise and fall of both sides of the chest?
E	**Equipment** – Equipment failure such as oxygen or humidification. Has the oxygen ports been checked and does the suction container need changing? Has the tracheostomy cuff deflated?

Emergency equipment

Being prepared is always important in the event of an emergency. Every child with a tracheostomy needs to have a tracheostomy emergency box/bag on them, at all times. At the Norfolk and Norwich University Hospital the boxes are blue and these should be checked every shift using the bedside checklist (see Tracheostomy Formation Care of the Adult Patient Protocol, Trust Docs ID: 1181)

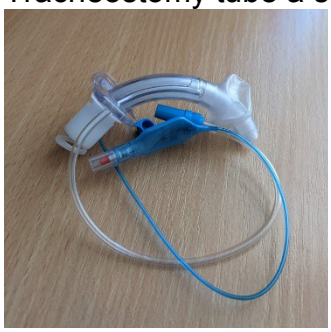

Tracheostomy
Safety
Box

Emergency tracheostomy equipment in the box

Blunt ended scissors

Catheter mount (15mm swivel connector)

1x Same size tracheostomy tube.1x Tracheostomy tube a size smaller



Lubricating gel

Tracheostomy tapes

Tracheal dilators

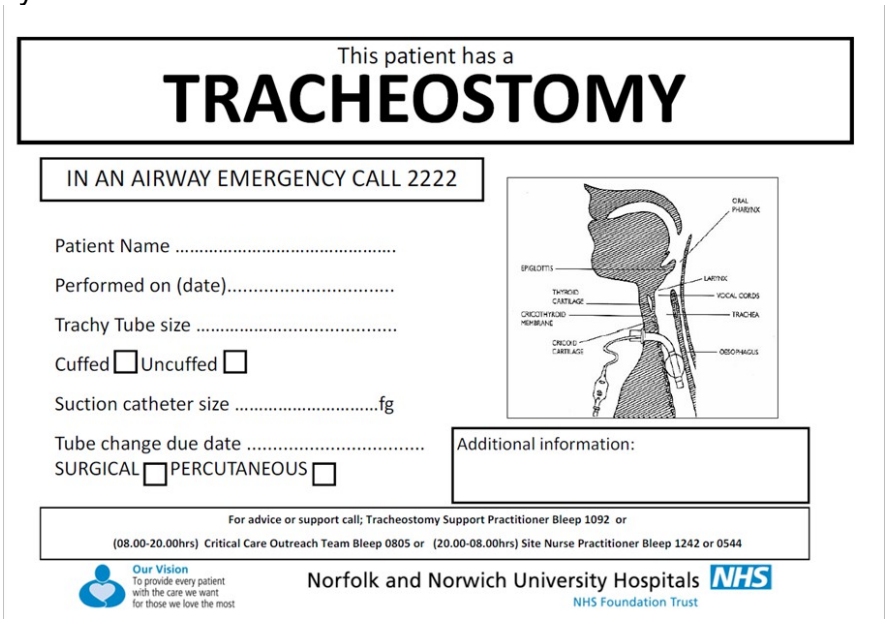
Paediatric face mask

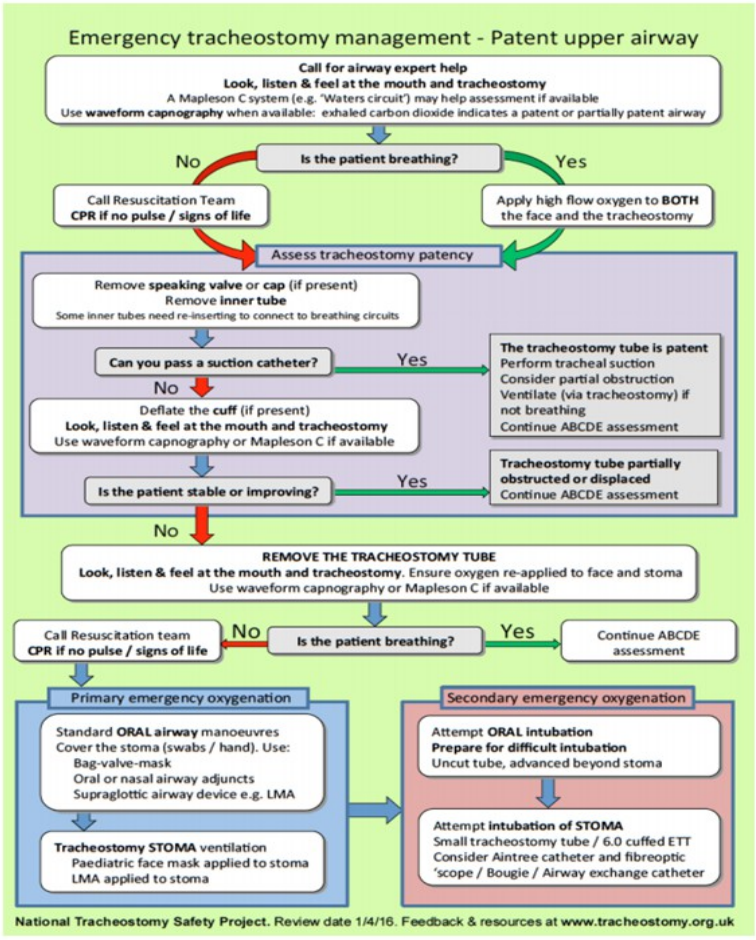
10ml syringe

Percutaneous guide wire	Disconnection wedge
	

Tracheostomy bedhead signs

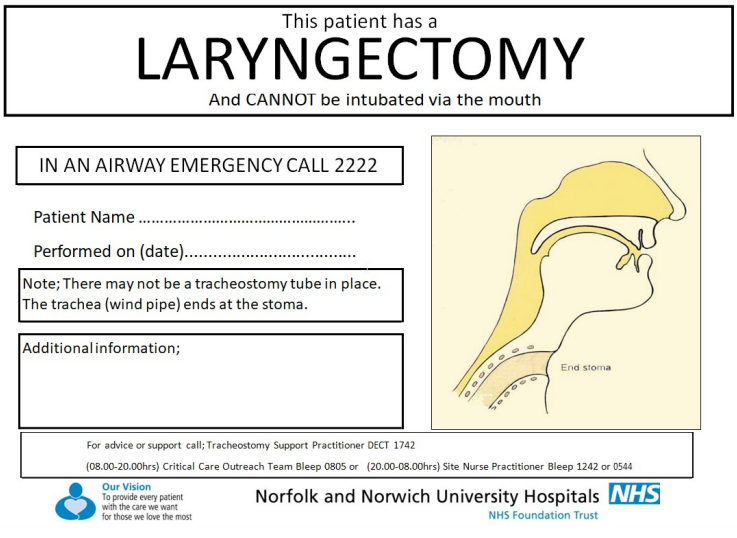
In hospital every patient should also have a tracheostomy bedhead sign (Trust Docs ID: 8967) and on the back should be the Emergency tracheostomy algorithm (Trust Docs ID: 1181) which can be followed in the event of an emergency. When calling 2222 make sure the state that it's an airway emergency and the adult has a tracheostomy

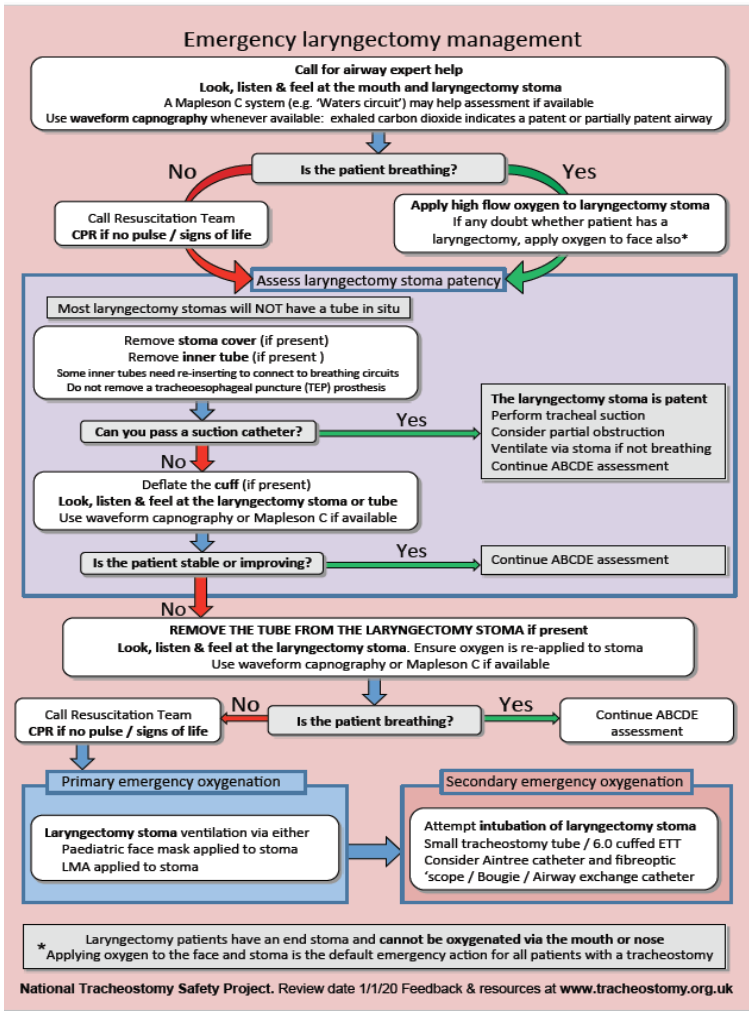




Laryngectomy bedhead signs

In hospital every patient with a Laryngectomy should have a Laryngectomy bedhead sign (Trust Docs ID: 8968) and on the back should be the Emergency Laryngectomy algorithm (Trust Docs ID: 8044) which can be followed in the event of an emergency. When calling 2222 make sure the state that it's an airway emergency and the adult has a tracheostomy.




Emergency laryngectomy management
Call for airway expert help
Look, listen & feel at the mouth and laryngectomy stoma
A Mapleson C system (e.g. 'Waters circuit') may help assessment if available
Use waveform capnography whenever available: exhaled carbon dioxide indicates a patent or partially patent airway
Is the patient breathing?
No
Yes
Call Resuscitation Team
CPR if no pulse / signs of life
Apply high flow oxygen to laryngectomy stoma
If any doubt whether patient has a laryngectomy, apply oxygen to face also*
Assess laryngectomy stoma patency
Most laryngectomy stomas will NOT have a tube in situ
Remove stoma cover (if present)
Remove inner tube (if present)
Some inner tubes need re-inserting to connect to breathing circuits
Do not remove a tracheoesophageal puncture (TEP) prosthesis
Can you pass a suction catheter?
Yes
The laryngectomy stoma is patent
Perform tracheal suction
Consider partial obstruction
Ventilate via stoma if not breathing
Continue ABCDE assessment
No
Deflate the cuff (if present)
Look, listen & feel at the laryngectomy stoma or tube
Use waveform capnography or Mapleson C if available
Is the patient stable or improving?
Yes
Continue ABCDE assessment
No
REMOVE THE TUBE FROM THE LARYNGECTOMY STOMA if present
Look, listen & feel at the laryngectomy stoma. Ensure oxygen is re-applied to stoma
Use waveform capnography or Mapleson C if available
Call Resuscitation Team
CPR if no pulse / signs of life
No
Is the patient breathing?
Yes
Continue ABCDE assessment
Primary emergency oxygenation
Laryngectomy stoma ventilation via either
Paediatric face mask applied to stoma
LMA applied to stoma
Secondary emergency oxygenation
Attempt intubation of laryngectomy stoma
Small tracheostomy tube / 6.0 cuffed ETT
Consider Aintree catheter and fibreoptic 'scope / Bougie / Airway exchange catheter
* Laryngectomy patients have an end stoma and cannot be oxygenated via the mouth or nose
Applying oxygen to the face and stoma is the default emergency action for all patients with a tracheostomy
National Tracheostomy Safety Project. Review date 1/1/20 Feedback & resources at www.tracheostomy.org.uk

Part 2 - Competency

Adult Tracheostomy Competency sign off

Objectives	Competency links to: Guideline for the Care of the Adult Inpatient with a Tracheostomy Tube (Trust doc: 1181) and tracheostomy care workbook.
Competence will be gained through	Competency will be achieved through private study and completion of tracheostomy care E-Learning, taught session, observation and supervision of practice
Assessment	Assessment of practice will be done on the day of training by the Tracheostomy Specialist/Support Practitioner. Assessment process: • Theory • E-learning to be completed prior to practical assessment. • practical skills on manikin • Assessment of practical skills on manikin
Re-assessment	Annual, 1:1 bedside training can be given as required/requested
Assessor qualifications	Tracheostomy Specialist/support Practitioner or clinical educator.

Recommended reading

Policy/Document/Recommended reading	**Completed**	
	Signature	**Date** *(dd/mm/yyyy)*
Tracheostomy Formation Care of the Adult Patient (Trust Docs ID: 1181)		
National Confidential Enquiry into Patient Outcome and Death (NCEPOD) 2014 – on the right trach?		
UK National Tracheostomy Safety Project https://tracheostomy.org.uk/		
Instructions and rationale for tracheostomy and laryngectomy admission and transfer operational procedure (Trust Docs ID: 7629)		

Multidisciplinary Team Accountability Log

All competent staff members writing or signing in this booklet are to complete this page.

Date	Full Name (Print)	Position	Signature

Formative Assessment

The Assessor and Practitioner meet to discuss prior knowledge and skills. Following this review a joint action plan can be developed and agreed by both parties.

A date for review of progress and completion of competency should also be set at this initial meeting.

Prior knowledge and skills of Practitioner relevant to competency: This is n/a as competencies will be assessed on day of training

Action Plan (How do you plan to achieve the skill?)
• To complete Adult tracheostomy e-learning • To attend practical session to assess skill • Practical based assessment where possible.

Date for completion	
Date for review of progress	

Signature of Practitioner		**Date** *(dd/mm/yyyy)*	
Signature of Assessor		**Date** *(dd/mm/yyyy)*	

Practical Assessment

The candidate's skill must be considered against The Stages of Clinical Competence during each observed/supervised demonstration. Each person will achieve competence with a skill at their own speed but a minimum number of attempts must be agreed and documented. Use the tables on the following pages to document progress then record a final assessment at the end.

Stages of clinical competence.
Stage 1: Novice
The Novice has no experience in the presented situation; they lack confidence and rely on clearly laid rules. They perform the task with little understanding and are unable to use discretionary judgement.
Stage 2: Advanced Beginner
Advanced beginners have had exposure to the presenting situation either through clinical practice or training exercises that enables them to discuss or demonstrate an understanding.
Stage 3: Competent
Competent Practitioners use their knowledge to perform Safe and effective nursing practice and interventions as defined by The Nursing and Midwifery Council (2010). They plan and implement the appropriate action to ensure the best outcome.
Stage 4: Proficient
Proficient practitioners use their knowledge and experience to critically analyse and evaluate situations and understand the most complex elements in order to make the relevant decision.
Stage 5: The expert
Expert practitioners operate from a deep understanding of the situation and have developed a 'feel' and a plan for any given situation.

Record of clinical practice

Dressing and collar change

Date (dd/mm/yyyy)	**Level of observed skill/ supervised skill**	**Candidates signature**	**Assessors signature**

Suctioning

Date (dd/mm/yyyy)	**Level of observed skill/ supervised skill**	**Candidates signature**	**Assessors signature**

Tracheostomy tube changes

Date (dd/mm/yyyy)	**Level of observed skill/ supervised skill**	**Candidates signature**	**Assessors signature**

Underpinning Knowledge

By the end of this assessment the Practitioner should demonstrate knowledge and understanding in relation to the learning objectives and be able to apply:

Legislation, policy and good practice and a working knowledge of:	**Competent**	
	Yes	**No**
Ethics and responsibilities of practitioners, and relevant professional bodies, codes of conduct, and guidelines		
Governmental and organisational policies relating to Paediatric tracheostomy care		
A factual knowledge of legislation and legal processes relating to Paediatric/Parental consent		
A factual knowledge of the importance of working within your own sphere of competence and seeking clinical advice when faced with situations outside your sphere of competence		
Anatomy and physiology and a working knowledge of:		
Anatomy and physiology of the upper and lower respiratory tract in a adult		
The impact of a tracheostomy on the respiratory system and humidification		
The impact a tracheostomy has on swallowing and communication mechanisms and child speech development		
Care and support / procedures and techniques and a working knowledge of:		
Dressing and collar changes.		
Stoma care		
Suctioning		
Humidification		
Emergency tube change and tracheostomy safety box		
Cuff pressure monitoring		
Resuscitation of adult tracheostomised patient		
Operational transfer and admission procedure and associated requirements.		
A working knowledge of Material and equipment of:		
Suctioning equipment (bedside and portable)		
Hot and cold humidification systems		
Contents and usage of the tracheostomy safety box		
A working knowledge of Reporting, recording and	**Competent**	

documentation of:	Yes	No
The importance of keeping accurate and up to date records		
Immediately reporting any issues which are outside your own sphere of competence without delay to the relevant member of staff		
The importance of completing the 24hr adult tracheostomy care chart		
The importance of completing the bedside checklist		
The importance of completing the Tube change chart		
The importance of completing the airvo chart		
The importance of completing the weaning programme chart		

Performance criteria

By the end of this assessment the Practitioner should demonstrate performance in relation to the learning objectives and be able to:

Learning Objectives:	Competent	
	Yes	No
Adhere to local policies and guidelines in the performance of paediatric tracheostomy care		
Prepare and maintain a safe environment.		
Demonstrate how to correctly prepare bed space and bedside equipment is appropriately prepared and available including paediatric bedhead labels/algorithms		
Demonstrate how to gain informed consent or understand justification and documentation when working in patients best interest for those unable to consent for procedures such as suctioning		
Demonstrate stoma care		
Demonstrate dressing and collar change		
Demonstrate appropriate use of humidification system/device		
Identify the need for suction		
Perform appropriate suctioning technique as indicated		
Demonstrate how to give the correct information following an adult tracheostomy care procedures.		
Demonstrate how to maintain accurate written records and record observation and actions taken appropriately on 24 hour adult tracheostomy care chart		
Identify complications relating to tracheostomy and the actions required (i.e. D.O.P.E, aspiration, displacement, blocked tube, over/under humidified, cuff intermittent deflation)		
Respiratory Resuscitation with a Paediatric tracheostomy		

Final Assessment

Once competency has been reached in all the relevant areas in the preceding pages please complete the following final assessment.

Please ensure:

- the relevant members of staff are aware that competence has been achieved and recorded as agreed by the Clinical Competency group.
- that a signed copy of the final assessment is placed in the individuals personnel file.

Assessor to complete:

I have assessed (PRINT) …… and have found them to be competent in the skill of Paediatric Tracheostomy Care.	
Assessors signature	
Print Name	
Designation	
Date *(dd/mm/yyyy)*	

Assessor's comments on successfully completing a final assessment:	
Assessors signature	
Print Name	
Date *(dd/mm/yyyy)*	

Candidate to complete:

I am confident in my ability to perform Paediatric Tracheostomy Care in accordance with the organisation's policies. **I acknowledge my accountability to maintain my competence in line with the requirements of my professional body and/or job description**	
Candidates signature	
Print Name	
Designation/Ward	
Date *(dd/mm/yyyy)*	

Candidate's comments on successfully completing a final assessment:	
Candidate signature	
Print Name	
Date *(dd/mm/yyyy)*	

References

The majority of the images included in this document are copyright free produced by Ann Hayes and photography by Matt Berry, Tracheostomy Support Practitioner, the remaining references are below.

Fig1:
WILAmed GmbH. (2014). Equipment for professionals. Ver 1.3. [PDF]. P. 4. Available at: https://www.wilamed.de/wp-content/uploads/2015/10/Prospekt_Atemgasbefeuchtung.pdf (Accessed: 18th March 2022).

Fig2:
WILAmed GmbH. (2014). Equipment for professionals. Ver 1.3. [PDF]. P. 5. Available at: https://www.wilamed.de/wp-content/uploads/2015/10/Prospekt_Atemgasbefeuchtung.pdf (Accessed: 18th March 2022)

Trust Docs
Tracheostomy Formation Care of the Adult Patient (Trust Docs ID: 1181)
Tracheostomy bedhead sign (Trust Docs ID: 8967)
Emergency tracheostomy algorithm (Trust Docs ID: 1181)
ANTT personal protective equipment (Trust Docs ID: 588).
Hand hygiene (Trust Docs ID: 613)
Tracheostomy and laryngectomy patients admission and transfer flow chart (Trust Docs: 7629)