Title: Policy and Guidelines for Tracheostomy Care

<table>
<thead>
<tr>
<th>Campus</th>
<th>The Alfred</th>
<th>Policy number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accreditation standard</td>
<td>Continuity of Care</td>
<td></td>
</tr>
<tr>
<td>Responsibility for Review</td>
<td>Mandy Sandford, Co-Director (Nursing), Musculoskeletal</td>
<td>Review Date: May 2005</td>
</tr>
<tr>
<td>Date Approved</td>
<td>May 2004</td>
<td></td>
</tr>
</tbody>
</table>

The following document states the purpose, policy and guidelines for the care of the patient with a tracheostomy and details further reading.

Authorised by (printed name & signature):  
Contact person: Mandy Sandford  
E-Mail:M.Sandford@alfred.org.au  
Position: Co-Director, (Nursing), Musculoskeletal  
Phone: 9276 2533
POLICY and GUIDELINES for TRACHEOSTOMY CARE

An education resource for nursing, allied health and medical staff caring for patients with a tracheostomy
The Policy & Guidelines for Tracheostomy Care were formulated by the following contributors:

- ICU Liaison - Nursing
- Co-Director (Nursing) – Musculoskeletal Directorate
- Medical units – ENT, ICU, Respiratory & Trauma
- Nursing Education
- Nursing - Trauma & ENT/Burns
- Nutrition
- Physiotherapy
- Speech Pathology
- Respiratory Therapy

Policy position responsibility rests with the Co-Director (Nursing) of Musculoskeletal Directorate.

The policy & guidelines will be reviewed annually.
## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>4</td>
</tr>
<tr>
<td>TRACHEOSTOMY POLICY</td>
<td>5</td>
</tr>
<tr>
<td>WHAT IS A TRACHEOSTOMY?</td>
<td>6</td>
</tr>
<tr>
<td>PHYSIOLOGICAL CHANGES WITH A TRACHEOSTOMY</td>
<td>7</td>
</tr>
<tr>
<td>INDICATIONS FOR A TRACHEOSTOMY</td>
<td>7</td>
</tr>
<tr>
<td>TYPES OF TRACHEOSTOMY</td>
<td>8</td>
</tr>
<tr>
<td>COMPLICATIONS</td>
<td>9</td>
</tr>
<tr>
<td>Emergency equipment</td>
<td>9</td>
</tr>
<tr>
<td>TYPES OF TRACHEOSTOMY TUBES</td>
<td>12</td>
</tr>
<tr>
<td>Double lumen tracheostomy</td>
<td>12</td>
</tr>
<tr>
<td>Single lumen tracheostomy</td>
<td>13</td>
</tr>
<tr>
<td>Cuffed tracheostomy</td>
<td>13</td>
</tr>
<tr>
<td>ASSESSMENT &amp; CARE OF THE TRACHEOSTOMY PATIENT</td>
<td>15</td>
</tr>
<tr>
<td>Assessment framework</td>
<td>15</td>
</tr>
<tr>
<td>Respiratory Assessment</td>
<td>16</td>
</tr>
<tr>
<td>Suctioning and Assessment of Secretions</td>
<td>17</td>
</tr>
<tr>
<td>Care of the Inner Cannula</td>
<td>19</td>
</tr>
<tr>
<td>Checking the cuff pressure</td>
<td>19</td>
</tr>
<tr>
<td>Care and assessment of Stoma</td>
<td>20</td>
</tr>
<tr>
<td>Humidification</td>
<td>21</td>
</tr>
<tr>
<td>Nutrition</td>
<td>22</td>
</tr>
<tr>
<td>Psychological and Communication impact of tracheostomy</td>
<td>23</td>
</tr>
<tr>
<td>EQUIPMENT REQUIRED TO FACILITATE CARE</td>
<td>23</td>
</tr>
<tr>
<td>DOCUMENTATION</td>
<td>24</td>
</tr>
<tr>
<td>CHANGING A TRACHEOSTOMY TUBE</td>
<td>25</td>
</tr>
<tr>
<td>TRANSPORTING THE PATIENT</td>
<td>25</td>
</tr>
<tr>
<td>WEANING FROM A TRACHEOSTOMY TUBE</td>
<td>26</td>
</tr>
<tr>
<td>REMOVAL OF A TRACHEOSTOMY</td>
<td>28</td>
</tr>
<tr>
<td>SUGGESTED FURTHER READING</td>
<td>30</td>
</tr>
<tr>
<td>APPENDIX 1 - Other types of Tracheostomy Tubes</td>
<td>31</td>
</tr>
<tr>
<td>APPENDIX 2 - Tracheostomy Care Record</td>
<td>33</td>
</tr>
<tr>
<td>APPENDIX 3 - Tracheostomy Tube Stock</td>
<td>34</td>
</tr>
</tbody>
</table>
INTRODUCTION

Patients with a tracheostomy present with complex needs that require specific management by the health team. It is the aim of this booklet to convey the hospital policy and guidelines for tracheostomy care. The booklet covers both theory and practice information to assist medical, nursing and allied health staff in the care of the patient with a tracheostomy. The information is an introduction to tracheostomy management and further reading is recommended. It should be noted that at times under certain circumstances variations from these guidelines will be appropriate. Any variation should be in consultation with the ENT unit or ICU registrar.

Further reading references are listed at the back of the booklet.

If you have any questions in relation to your patient's tracheostomy not met by this information booklet, please call the –

- ICU Liaison Nurse - #5083 (0800-1800 Mon-Sun)
- ENT Registrar - via switch
- ICU Registrar - via switch
TRACHEOSTOMY POLICY

The management of patients with tracheostomies must ensure safety of the patient whilst progressing towards safe removal of the tracheostomy tube.

Best practice is to plan the management of the patient for earliest decannulation to reduce the risk of possible complications.

Safety of patients is achieved through education and use of guidelines and protocols for clinical management.

A patient with a tracheostomy requires frequent observations to prevent / minimise complications; the frequency of these observations is decided on clinical assessment of the patient.

Reporting of clinical indicators ensures the safety of patients is monitored, maintained and improved.

Unit responsible for tracheostomy management

The decision to insert a tracheostomy is made by the medical team. In ICU the decision is made by the intensivist and confirmed with the parent unit. In the ward, by the parent unit.

The unit who performs the procedure takes principal responsibility for management of the tracheostomy.

In particular, patients in the general wards who have a tracheostomy inserted by ICU will be reviewed by the ICU medical staff and the ICU Liaison Nurse.

This includes:
- ongoing assessment
- complication management in association with the ENT unit
- decannulation planning in liaison with the parent unit.
WHAT IS A TRACHEOSTOMY?

A tracheotomy is a surgical opening made in the trachea through which a tracheostomy tube is inserted.

The Anatomical Position of a Cuffed Tracheotomy Tube
PHYSIOLOGICAL CHANGES WITH A TRACHEOSTOMY

A tracheostomy reduces the anatomical dead-space by 50%. Anatomical dead-space refers to the part of the respiratory tract that is incapable of gaseous exchange.

Normally, the nasal cavities filter and humidify the air that passes through the nose. The pharynx transmits air into the larynx, vocal cords and trachea. The trachea ends by dividing into the left and right main bronchi leading to the terminal bronchioles. As the air passes via the larynx on inspiration and expiration, the vocal cords are open and air flows freely to and from the trachea. During speech, the vocal cords are closed and vibrate. During swallowing, the vocal cords and epiglottis close to prevent food from entering the trachea.

A tracheostomy re-routes the passage of air directly into the trachea and lungs, bypassing the upper airway completely. The physiological changes are -

- temporary voice loss
- loss of filtering action of the nose
- loss of normal humidification by the nasal cavities
- loss of normal warming of the air
- potential impairment of swallow
- altered sensation and cough reflex.

INDICATIONS FOR A TRACHEOSTOMY

Some of the most common indications for a tracheostomy include:

- physical obstruction of the upper airway
- airway protection to prevent/minimise aspiration into the lungs
- sputum clearance where patients are unable to adequately clear their secretions
- mechanical ventilation where the weaning process is expected to be slow.
**TYPES OF TRACHEOSTOMY**

**Temporary** tracheostomy is performed as an elective procedure with the aim to remove when clinically indicated. It can be performed as a percutaneous procedure or a surgical procedure.

A *percutaneous procedure* is usually performed at the bedside by ICU medical staff. The intubated patient is given an anaesthetic whilst the endotracheal tube is pulled back to the level of the larynx. A small incision is made, the trachea dilated to the size of the selected tracheostomy tube and insertion of the tube into the trachea.

Advantages - the patient does not require transport to theatre
- easier and faster procedure
- less incisional scarring

A *surgical procedure* is performed in the operating theatre by a surgical team. A surgical wound is fashioned and dissection is carried down to the trachea. An incision is then made in the trachea wall, through which the tube is inserted. A surgical procedure is used on selected ICU, ENT or Facio-maxillary patients requiring tracheostomy.

Advantages - improved surgical vision for patients with altered anatomy
- more control of bleeding especially in coagulopathic patients.

**Permanent** tracheostomy is performed as a procedure with the view of being permanent for maintenance of airway. For example; on a patient with an upper airway obstruction due to chronic disease process or as a palliative measure for upper airway obstructive tumours.

**Emergency** tracheostomy is performed in the event of an acute obstructed airway when endotracheal intubation is not possible. A cricothyroidotomy may be performed or an experienced operator may perform a formal tracheostomy dependent on anatomy and clinical scenario.
COMPLICATIONS

Tracheostomy related complications can be potentially life-threatening. Immediate action is required to ensure a patent airway, adequate ventilation and minimise long term effects. All complications must be immediately reported to the parent unit, the unit who performed the tracheostomy and the ICU Liaison Nurse for advice and audit. The ICU Liaison Nurse will record complication data, that will be reported bi-annually.

Emergency equipment

Specific equipment to manage an emergency is required at the patient’s bedside. These items are:
- spare tracheostomy tubes - same size/type and size 7 or 7.5
- hooks & dilator
- laerdal resuscitation bag with straight attachment (to connect tracheostomy tube to bagging circuit)
- 10ml syringe

Keep the equipment together and clean in a plastic bag, in a clearly visible position at the bedside. The nurse MUST check the equipment at the commencement of each shift to ensure preparedness to respond in any tracheostomy emergency.

The emergency equipment must be carried with a patient on any transfer out of the ward. It is essential that the patient is not left in an area unfamiliar with tracheostomy management or without appropriate emergency equipment.

1 Acute respiratory distress
   (eg: evidenced by acute SOB/↑WOB/↓SaO2/physical distress)

   The first line management -
   - MET call
   - Remove the inner cannula of a double lumen tube & check for blockage. In the case of a single lumen tracheostomy, suction the tube
   - Ventilation via resuscitation bag at 100% oxygen
2 Unplanned decannulation
Assess respiratory function

Stable
↓
Place gauze over stoma & cover with tegaderm
O₂ via face mask prn
Notify the parent unit

Unstable
↓
MET Call
+/- Reinsert clean tube
Ventilate via resuscitation bag

3 Obstruction: may occur due to
- inadequate humidification of airway which may lead to blockage of inner cannula
- cuff herniation
- tracheal tear or flap occluding lumen
- misplaced position against tracheal wall or endobronchial intubation
- dislodgment into pre tracheal tissue
- large double chin(ensure positioning to prevent occlusion).

4 Haemorrhage: may be due to –
- trauma related to suctioning
- tube erosion of tracheal wall
- ulceration at stoma site
- bleeding may occur from the tissue of the tract between the tracheal mucosa and the skin, which includes bleeding from the region of the thyroid isthmus.

- Detection of any bleeding from within or around the tracheostomy must be reported immediately to the unit who performed the insertion of the tracheostomy for advice and audit.

5 Infection: can occur due to –
- inadequate stoma care
- poor compliance with blood body substance precautions
- inadequate chest toilet ie: poor cough, inadequate suctioning
- microaspiration of oropharyngeal secretions.
6 **Tracheo-malacia and stenosis** - This is a condition where the calcium in the cartilages of the trachea are absorbed and the trachea becomes floppy rather than rigid. Causes include tracheostomy insitu for too long, and pressure from the tracheostomy on the wall of the trachea. Tracheal stenosis is a result of scar formation due to cuff-induced irritation of the tracheal mucosa. Contributing factors may include oversized tube, over-inflated cuff or infection/destruction of cartilage.

7 **Tracheoesophageal fistula** – Characterised by tracheal wall necrosis from an over-inflated tracheostomy cuff increasing the pressure on the tracheal mucosa. As the pressure increases ischaemia occurs leading to necrosis and fistula formation. The fistula provides an opening into the oesophagus that may cause aspiration of ingested matter. Contributing factors include: the tracheostomy tube too large, over-inflated cuff, or exacerbation by large bore NG tube (fine bore naso-gastric tubes are recommended).

8 **Other complications**
   - pneumothorax
   - cricoid ring damage
   - injury to recurrent laryngeal nerve
   - injury to the oesophagus.
TYPES OF TRACHEOSTOMY TUBES

The practitioner inserting the tracheostomy will select the tube of choice. When choosing the type and size of tube consideration is given to: anatomy, the size of the patient and the indication for the tracheostomy.

Double lumen tracheostomy
The Alfred most commonly uses a Portex Blue Line Ultra double lumen cuffed tracheostomy tube. The features of this tube are –
- thermo-sensitive material that conforms to the patient’s airway at body temperature, minimising trauma
- anatomically shaped flexible flange for patient comfort
- soft seal cuff designed to reduce bulk to help ease of insertion
- high volume/low pressure cuff
- reusable inner cannula
- ring pull on the inner cannula to allow ease of removal
- long or short term use
- sizes 7.0 7.5 8.0 8.5 9.0 10.0.
**Inner cannula**
It is recommended that all tracheostomy tubes on general wards contain an inner cannula.

This:
- allows for frequent removal and inspection of the inner lumen reducing the risk of blockage with secretions
- reduces the need for frequent tube changes

**Single lumen tracheostomy**
Rarely, a single lumen tracheostomy tube may be used for a patient in the general ward. Single lumen tracheostomies have a greater risk of blockage with secretions therefore close monitoring by flexible bronchoscope of the inner lumen is essential. **A patient with a single lumen tracheostomy (outside of ICU) must be referred to the ENT unit for weekly review and assistance with further management.**

There are many other types and brands of tracheostomy tubes. A brief description of tubes less frequently used at The Alfred can be found in Appendix 1. If your patient has a tube other than the Portex double lumen please contact the ICU Liaison Nurse for further information.

**Cuffed tracheostomy**
The cuff of a tracheostomy is located at the distal end of the tracheostomy tube that sits in the patient’s trachea. The cuff can be inflated with air to achieve a seal between the tube and the trachea. An inflated cuff will prevent normal nose/mouth breathing and gross aspiration. An inflated cuff does not prevent micro-aspiration of secretions from above the cuff. To minimise risk of aspiration patients’ with a tracheostomy must be nursed in the head elevated position unless contraindicated.
Manometers
Two types of manometers used at The Alfred
ASSESSMENT AND CARE OF THE TRACHEOSTOMY PATIENT

A baseline patient assessment must be done at the start of **EVERY SHIFT**.

Comprehensive and ongoing assessment is continued throughout the shift in response to patient changes and to evaluate the effectiveness of interventions.

Develop your own approach to the assessment, ensuring all points are covered.

- the 3-5 second eyeball which tells you there is no immediate problem with your patient.
- check suction connected correctly and functioning
- check oxygen delivery system – flow, FiO2
- check humidification delivery system – temperature, date the disposables are due for change and water level
- check emergency equipment present and functioning
- check all required equipment necessary to care for the tracheostomy patient is by the bedside
- assess patient’s respiratory function
- note tracheostomy tube type and size
- remove the inner cannula and check patency of tube
- check cuff pressure and document
- assess stoma site and dressing
- check tracheostomy tapes clean and secure
- check naso-gastric feeding tube position if insitu
- check patient position to be comfortable and head upright.

Collecting a baseline of information will assist in the planning of patient care and in the delivery of safe care.
Respiratory Assessment
Assess - general patient comfort
- heart rate, BP, respiratory rate and temperature
- work of breathing
- ability of patient to cough secretions clear of tube
- level of peripheral oxygen saturation
- breath sounds, clear/crackles/wheeze
- fluid status appropriate.

Hypoxia
Oximeters are useful in assessing hypoxaemia. However an oximeter does not measure ventilation. The retention of carbon dioxide can occur when ventilation is inadequate. Arterial blood gases are the test of choice for measuring both oxygenation and ventilation.

How to assess for hypoxia
- Heart rate: a breathless person initially experiences tachycardia. In severe hypoxia bradycardia can occur
- Skin colour: a pale skin appearance occurs as catecholamines are released. This may progress to cyanosis. Cyanosis is a bluish discolouration of the skin and mucous membranes
- Mental state: agitation, drowsiness, confusion or impaired consciousness may occur.

Work of Breathing (WOB)
WOB in healthy individuals is quiet, minimum effort at a respiratory rate of approximately 12 b/m with relaxed use of diaphragm and associated respiratory muscles. Signs of increased work of breathing include:
- increased respiratory rate
- increased depth of respiration
- noisy respirations
- nasal flaring
- use of accessory muscles (including neck, upper rib cage, shoulders and abdominal muscles).
- respiratory rate RR > 20 can be an indication of early respiratory distress. RR < 12 can also indicate deterioration in the patient’s condition. Possible causes for decreasing RR are hypothermia, CNS depression and use of opiates.
Auscultation
Auscultation of the chest is recommended at the start of every shift and throughout the shift to assess for presence of secretions in the airways. Breath sounds should be equal bilaterally and audible in all lung zones. Breath sounds are produced in the larger airways where airflow is turbulent. Sounds are transmitted through smaller airways to the chest wall.
If you are not experienced at auscultation listen to your patient’s chest with an experienced practitioner who can guide you on sounds heard.

Suctioning and Assessment of Secretions

Suctioning
To minimise the risks associated with suctioning, this procedure should only be performed when clinically indicated. Ask the patient to cough or auscultate lung fields to determine need to suction. Indications to suction include:
- patient unable to clear secretions (poor or absent cough)
- mucus bubbling in the tracheostomy tube
- crackles heard on auscultation or audible gurgling sound
- dyspnoea
- decreased oxygen saturation
- deteriorating skin colour
- stridor or changes in breathing sounds
- patient request.

Suctioning a tracheostomy is a CLEAN procedure. The catheter passed into the lungs must not be contaminated by any surface. A CLEAN unsterile glove MUST NOT have touched ANY other surface before contact with the sterile suction catheter.

Refer to the hospital policy ‘Tracheal suction in the non-ventilated patient’ for detail on the suction procedure.

Following a suction episode, discard the Y catheter and rinse suction tubing with sterile water. The bottle of sterile water must be labelled ‘FOR SUCTION TUBING ONLY’. Date and time the bottle on opening and discard after 24 hours.

Sheath the suction tubing by connecting to a spiggot or cover with the empty packaging of the Y suction catheter.
Size of Y suction catheter
To avoid large negative pressures in the airway and minimise falls in oxygen saturation the size of the suction catheter should occlude no more than half of the internal diameter of the tracheostomy tube. Generally advocated:

Size 8 tracheostomy tube use a 12 French Y suction catheter
Size 9 tracheostomy tube use a 14 French Y suction catheter

Potential complications associated with suctioning
- Hypoxemia - prolonged suctioning impairs oxygenation therefore apply suction for no more than 10-15 seconds.
- Arrhythmias/bronchospasm - myocardial hypoxia and stimulation of the vagus nerve in the tracheobronchial tree during suctioning can result in cardiac arrhythmia and bronchospasm.
- Trauma - tracheal lesion development relates directly to the amount of time vacuum is applied during suctioning. Suction duration of <10-15 seconds decreases risk of trauma. To minimise tracheal mucosa damage, suction only when clinically indicated. Report any blood stained secretions to parent unit.
- Infection – non adherence to clean technique when suctioning and micro-aspiration of oropharynx secretions increases risk of infection.

Secretion assessment
- The amount and type of secretion should be assessed each time the patient expectorates or is suctioned.
- The sputum should be described in relation to appearance and amount; e.g. small, moderate or large and clear, purulent, or bloody. (See Appendix 2 for example of documenting secretions).
- Sputum being a mucus, is normally of a tenacious consistency. However if sputum becomes thickened and more difficult to suction, consideration should be given to the use of a mucolytic, such as Mucomyst, 3 mls QID, nebulised.
- To optimise chest condition tracheostomy patients should be mobilised as soon as possible.
- Patients confined to bed must be positioned side to side 2-4 hourly to aid in secretion removal by postural drainage.
Care of the Inner Cannula

- Wear gloves when handling blood or body fluids
- A spare inner cannula of the correct size must be kept at the bedside at all times
- The size of the inner cannula will correlate to the size of the tracheostomy tube
- Inspect the inner cannula at the start of each shift for patency.
- Remove the inner cannula a minimum of once per shift and replace immediately with the spare inner cannula. If the outer tube is left without an inner cannula for any length of time then crusting can occur which may lead to obstruction
- Wear protective eyewear when cleaning the inner cannula
- Place in a clean dish and cover with sterile water
- Gently agitate to remove secretions.
- Remove from water and store in dry, covered receptacle. **DO NOT WASH AND STORE IN THE SAME RECEPTACLE.**
- Regular cleaning of the inner cannula clears the lumen of accumulated secretions
- To minimise the risk of colonisation **DO NOT SOAK** the inner cannula
- The manufacturers of the Portex double lumen tubes recommend not to use hydrogen peroxide or Q tips to clean the inner cannula as they may compromise the integrity of the material.

Checking the cuff pressure

To minimise the risk of tracheal mucosal necrosis, chondromalacia, (a softening of tracheal cartilagenous rings), stenosis or fistula, the pressure within the inflated cuff must be monitored.

- At the commencement of every shift (ie: 8 hourly) check the pressure via the pilot tube with a cuff manometer.
- The pressure must be kept at less than 25cm H₂O and ideally at the least amount of pressure required to maintain a seal.
- Check the cuff seal by placing your hand in front of the mouth and nose asking the patient to exhale. If breath is detected from the mouth or nose, inflate the cuff until exhaled gas is not felt above the cuff.
- Another technique for checking the adequacy of the seal is to place a stethoscope on the neck above the level of the cuff. If the movement of gas is heard above the cuff inflate the cuff until gas flow is no longer heard.

- If there are any problems with the cuff pressure, or integrity is compromised, contact the ICU Liaison Nurse, ENT Registrar or ICU Registrar.

**Care and assessment of Stoma**

To prevent infection or ulceration of the stoma site, wound care is essential. The surrounding skin is at an increased risk of breakdown due to constant moisture and heat from humidification and the presence of any secretions. Close monitoring of the stoma is necessary to promptly remove any secretions and detect any signs of infection or loss of integrity of surrounding skin.

Assess the stoma site once per shift for:
- Skin integrity - clean, dry and intact
- Colour - no overt sign of redness
- Drainage - free of purulent secretions
- Swelling - no local swelling or crepitations.

Include assessment of:
- Current dressing and securing tapes
- Required frequency of dressing and tracheostomy tape change.

**Cleaning the stoma and changing the tapes**
- The stoma should be cleaned once per shift and prn.
- Wear eye protection and clean unsterile gloves; use sterile gauze and saline to gently wipe away any secretions or discharge.
- Ensure the flange is lifted and the edges of the stoma cleaned of all residue.
- An absorbent keyhole foam dressing is recommended to protect the surrounding skin from secretions. (ie: Fenestrated Hydrasorb/Lyofoam).
- The tracheostomy is secured by tracheostomy tapes.
- Soft foam tapes with Velcro securing tags are recommended. These tapes are gentle on the skin and easily removable. They are washable and reusable, however discard if heavily soiled or damaged.
- Tapes should be changed at least every 24 hours or more frequently if wet or soiled.
- It is essential that two nurses are present whenever tapes are changed to stabilise the tracheostomy tube and prevent unplanned decannulation.

Humidification

Humidification of the gas delivered to the tracheostomy patient results in increased heat and moisture content of the gas. In normal breathing, inspired air is warmed, filtered and moistened in the nose and upper airway. A tracheostomy tube bypasses this natural mechanism. The subsequent administration of a dry gas can cause physiological changes.

Inadequate humidification may result in:
- increased risk of tracheostomy tube obstruction
- thickened secretions
- small airway obstruction
- atelectasis
- impaired gas exchange.

Artificial humidification must therefore be administered to replace normal mechanisms. Optimum humidification can be achieved by using the Fisher-Paykel 850 humidifier. This humidifier is preferred as it provides optimum humidification at 37.5°C and 85% humidity thus closely replicating normal physiological humidification.

All patients with a tracheostomy will be discharged from the ICU with a Fisher-Paykel 850 humidifier. If your patient does not have a humidifier, obtain a unit from the ICU Respiratory Room (Ext:3092) or contact the ICU Liaison Nurse(#5083) to arrange for equipment loan.

To minimise the risk of infection, the disposable humidification circuit should be **changed every 7 days**. Use the manufacturer provided stickers to ensure that the date and time for change are easily visible on the disposable set.
Assessment of the humidifier each shift should include –
- temperature is at 37°C (set on artificial airway diagram)
- FiO2 and O2 flow is correctly set
- level of sterile water in the flask and chamber is adequate
- circuit is labelled with date due to be changed.

Select patients may be suitable for weaning of humidification. Please refer to the ICU Liaison Nurse or the ENT Unit for advice.

It is recommended that Heat Moisture Exchange filters (HME) or Swedish noses be used only on patients who have a long-term tracheostomy tube (eg: > 6 weeks), minimal secretions and are able to independently care for and remove the device. Assessment and monitoring for blockage with secretions must be constant.

**DO NOT USE HME FILTERS ON PATIENTS WITH A SIGNIFICANT NEUROLOGICAL DEFICIT. A PATIENT MUST BE ABLE TO INDEPENDENTLY CARE FOR AND REMOVE THE DEVICE**

**Nutrition**
A fine bore naso-gastric feeding tube (or a PEG-long term) is the device of choice when administration of nutrition is required. A fine bore naso-gastric tube or PEG reduces the potential complication of reflux. It also reduces the risk of fistula formation. Large salem sump naso-gastric tubes are a greater risk for nasal trauma and interference with the swallow reflex.

When a naso-gastric tube of any type is in-situ it must be checked every shift for correct position. The tube should have a marker at the point of insertion to indicate if any dislodgment has occurred. Administer 30mls of air into the stomach while auscultating for rush of air to be heard over the upper mid-left quadrant.

All tracheostomy patients should be nursed in the head elevated position to decrease the risk of aspiration.

Enteral nutrition regimens can be adapted in consultation with the dietitian to reduce aspiration risk and promote oral intake.
Oral intake in the tracheostomy patient
Select tracheostomy patients may be assessed as appropriate for oral intake. Tracheostomy patients should be assessed by Speech Pathology prior to commencing oral intake. These patients will need to be –
- awake, alert and responding to one stage commands
- managing own saliva
- tolerating trache-hood and able to tolerate cuff deflation.

Psychological and Communication impact of tracheostomy
Consideration should be given to the psychological needs of the patient with a tracheostomy because the loss of control over airway and voice can be exceedingly anxiety provoking. Ensure the cognisant patient has the means to call for assistance at all times. Offer constant reassurance and support.

Assess the patient for the most suitable means of establishing communication. For example:
- the use of whiteboards for written communication
- alphabet boards
- flash cards with common words or requests
- encourage the patient to mouth words.

Should the patient experience difficulty communicating, contact the Speech Pathology department.

EQUIPMENT REQUIRED TO FACILITATE CARE

Recommended bedside equipment necessary to care for the tracheostomy patient
- Eye protection (goggles)
- Y suction catheters (12 & 14)
- Yankeur sucker
- Disposable gloves
- Sterile water 1000ml bottles X2 (MUST be labelled)
  1. “for inner cannula”
  2. “for suction tubing only”
     (date & time when opened, discard after 24 hours.)
- Cuff manometer
- Rubbish disposal bag
- Hexol
- Clean cover for trolley
- Dry receptacle
- Spare inner cannula of the same size
- Emergency Equipment (see page 9)

**DOCUMENTATION**

Clear and concise documentation of the assessment and care of the tracheostomy patient is important so all staff can be informed of the patient’s condition and progress.

Post insertion – the operator will document:
- operator name, parent unit and date
- the procedure and any related complications
- medical unit responsible for tracheostomy management
- indication for insertion
- type and size of tube

All patients with a tracheostomy tube must have a Tracheostomy Care Record MR R-71 completed (Appendix 2). This chart allows for the documentation of:
- sputum amount and type
- patient position
- humidification
- cuff pressure
- inner cannula inspections.

The Observations Chart (MR R-60) records:
- vital signs
- FiO2
- O2 flow
- SaO2 a minimum of 4 hourly.
Daily documentation in the progress notes should include:
- respiratory assessment, including strength of cough
- secretion assessment, including ability to independently clear
- stoma assessment
- patient tolerance/comfort
- complications.

CHANGING A TRACHEOSTOMY TUBE

Changing a tracheostomy tube is increasingly uncommon. The use of double lumen tubes, which reduce the risk of inner lumen blockage, has negated the need for regular tube changes. A tube may be changed if there is a complication detected necessitating the change or rarely, if downsizing is deemed necessary. Downsizing is avoided but may be considered if the patient has a large tube insitu (greater than size 8.0) prior to decannulation. Contact the ENT Unit or ICU Registrar for advice on downsizing. Changing a tracheostomy tube must be performed by medical or nursing personnel experienced in this procedure.

TRANSPORTING THE TRACHEOSTOMY PATIENT

Any patient with a tracheostomy transported from their ward or unit to another department must be accompanied by a nurse experienced in the management and care of the patient with a tracheostomy. The patient must be in the care of a nurse at all times in all hospital departments. Particularly in the radiology department the patient care must be handed over to the radiology nursing staff. Exception to this may be those patients who are self-caring regarding the tracheostomy.

Equipment to be taken with the patient -
- emergency equipment (see page 9)
- portable oxygen cylinder with suction attachment and tubing
- Y suction catheters
- unsterile gloves, safety glasses
WEANING FROM A TRACHEOSTOMY TUBE

The decision to wean from a tracheostomy in the ward is made by the medical unit managing the tracheostomy in consultation with the parent unit, nursing, physiotherapy and speech pathology.

Weaning commences when the primary reason for the tracheostomy is resolved and the patient’s condition is deemed stable, evidenced by:

- able to protect own airway
- able to induce a forceful cough
- stable ventilation (ie: > 2 hours off ventilator and  
  \( \text{PaCO}_2 < 55 \text{ mmHg} \))
- decreasing FiO2 (ie: < 40%)
- decreasing suctioning requirements (ie: > 4 hourly)
- stable, improving CXR appearance

Any concern regarding the patient’s ability to protect their airway from oral secretions, refer to the Speech Pathologist.

Deflating the cuff

Weaning commences with short periods of supervised cuff deflations. An experienced nurse, physiotherapist or speech pathologist can deflate the cuff. Personnel deflating tracheostomy cuffs must be competent in the procedure.

Sit patient upright unless contra-indicated

Prior to deflating the cuff ask the patient to swallow or expectorate any oral secretions; if necessary suction the oral cavity.

Monitor the patient’s respiratory condition and saturation during initial cuff deflation.

Connect Y suction catheter to suction tubing and be prepared to suction tube as necessary

Deflate the cuff with a 10ml syringe until fully deflated, evidenced by no remaining air in the pilot tube pillow.
The patient may initially cough as secretions sitting above the cuff descend into the lungs stimulating the cough reflex. Allow the patient to expectorate independently if able or assist with suction.

Monitor oxygen saturation, secretion production, respiratory pattern and effort. If the patient becomes distressed, desaturates, or the amount of secretion increases, weaning is abandoned. The patient is rested and reassessed the following day for readiness for cuff deflation trial.

When short periods of 20-60 minutes of cuff deflation are tolerated, increasing periods of cuff deflation can be attempted. The aim is to deflate the cuff during the day and reinflate overnight.

In some instances a decision can be made to leave a cuff deflated overnight. This decision may be made for those long term tracheostomy patients who have no evidence of aspiration, are tolerating enteral nutrition via an enteric or PEG tube, and are nursed in the head up position.

If at any stage in the weaning process the patient’s condition deteriorates (becomes febrile, requires increasing oxygen demands, CXR deterioration, excessive coughing or increase in secretion production) the patient should be reassessed for reinflation of the cuff.

To reinflate the cuff, inject approximately 4 mls of air into the pilot tube, check cuff pressure with a manometer and confirm an airway seal with safe pressure of less than 25cm H₂O.
REMOVAL OF A TRACHEOSTOMY

The recommended assessment and preparation required prior to decannulation includes:
- gastric/enteric feeds turned off for approximately 4 hours
- no sedation for 12 hours
- no coagulopathy
- no upper airway obstruction
- adequate muscle strength, strong cough and able to clear secretions adequately
- less than 40% inspired oxygen concentration
- successful cuff deflation trial.

The decision to remove the tube is made by the medical unit managing the tracheostomy in consultation with the parent unit, nursing, physiotherapy and speech pathology.

A person experienced in the care and management of tracheostomy performs the removal of the tube or supervises the removal of the tracheostomy.

The unit responsible for the medical management of the tracheostomy needs to be aware of the time planned to decannulate the patient and be available to assist in the event of a complication.

Procedure
- check emergency tracheostomy equipment
- explain the procedure to the patient
- position the patient upright in bed
- monitor oxygen saturation
- wear protective eyewear
- wear unsterile gloves
- ask patient to cough to remove any secretions from lungs
- ask patient to expectorate any oral secretions
- suction lungs or oropharynx as necessary
- fully deflate cuff with 10ml syringe
- loosen securing tapes
- ask patient to exhale whilst simultaneously withdrawing the tracheostomy tube in an outward and downward movement
- clean and cover the stoma
- supply oxygen via face mask or nasal prongs as required
- monitor the patient for any respiratory deterioration.
In the event of acute respiratory distress at any time following the removal of a tracheostomy tube respond with a MET call. Provide respiratory support via a resuscitation bag as needed. Reinsert tracheostomy tube as appropriate.

- ensure the patient has a call bell in reach at all times
- leave the emergency tracheostomy equipment by the bed for a further 24 hours
- remain nil orally for 4 hours post decannulation
- assessment of swallow by a speech pathologist prior to commencing oral intake

Recommended dressing
Place a square of sterile gauze over the stoma site and cover with an occlusive dressing, such as Tegaderm. If reinforcement is necessary, use a single strip of 1 inch sleek over the stoma (on top of the Tegaderm). Sleek is not recommended as the primary dressing as it is difficult to achieve a seal and is harsh on the skin.
SUGGESTED FURTHER READING

Texts
Guidelines for the Care of Patients with Tracheostomy Tubes St. George’s Healthcare NHS Trust. SIMS Portex Ltd.

Tippett, Donna C. Tracheostomy and Ventilator Dependency, Management of Breathing, Speaking and Swallowing. Thieme. 2000

Dikeman, Karen J. & Kazandjan, Marta S. Communication and Swallowing Management of Tracheostomized and Ventilator Dependent Adults. Singular Publishing. 1995

Published Articles

Tamburri, LM. 2000 Care of the Patient with a Tracheostomy. Orthopaedic Nursing 19 (2) 49-58

Theaker, C. 1999 Pitfalls in Tracheostomy Care. Care of the Critically ill 15 (5) Insert

Thompson, L. 2000 Suctioning Adults with an Artificial Airway. The Joanna Briggs Institute for Evidence Based Nursing and Midwifery; Systematic Review No. 9


Web sites
www.simsportex.com
www.mallinckrodt.com
www.joannabriggs.com
APPENDIX 1 - OTHER TYPES OF TRACHEOSTOMY TUBES

Contact the ICU Liaison Nurse(#5083) for further information on any of these tubes.
* Refer to Appendix 3 for list of tracheostomy tube stock within the hospital.

**Mallinckrodt tracheosoft reinforced** – Single lumen, soft reinforced tube with a variable flange to provide a longer tube and used when the trachea is deeply situated due to anatomical factors, neck swelling or to place the cuff beyond a tracheal injury.

**Shiley double lumen** – A tube similar to the Portex Blue Line Ultra in that it has an inner cannula which can be removed for inspection and cleaning, therefore reducing the risk of tube blockage. The action required to remove the inner cannula is a twist and unlock to withdraw. This tube is made of is more rigid material than the Portex and the sizing is slightly larger.

**Portex single lumen Blue line** – A Portex tube which does not have an inner cannula. This tube may be used in an emergency situation such as reinsertion in the event of accidental decannulation. It should not be used for an elective tracheostomy.

**Portex variable flange rigid** – A single lumen tube of variable length depending on the length the operator inserting the tube selects. It may be used to intubate beyond a bleeding point if tracheal haemorrhage occurs.

**Bivona foam cuff** – A single lumen tube selected for patients experiencing significant aspiration where a traditional cuff is not providing an adequate seal. The cuff is self inflating and exerts an even pressure on the tracheal wall whilst providing a seal.
Fenestrated tubes – These tubes are double lumen tubes that have small openings in the arch of the outer cannula that sits in the trachea. When the inner cannula is removed these ‘fenestrations’ or holes allow the passage of air to pass up through the vocal cords allowing for the possibility of speech. The Shiley fenestrated tube has a single fenestration. Suctioning via this tube MUST always be performed with the non-fenestrated inner cannula inserted as there is a risk of the catheter passing through the fenestration and traumatising the tracheal wall. Portex fenestrated tubes do not have the same risk associated, as the fenestrations are much smaller through which a suction catheter could not pass. In addition it should be noted that the single, larger fenestration may be more prone to causing the formation of granulation tissue.

Uncuffed tubes – Tubes can be supplied without a cuff. Patients who are able to protect their airway but require a tube for secretion clearance may be selected for this tube. Other patients may include those who require long term tubes for airway maintainence such as laryngeal pathology or tracheal stomas.

Note 1: Fenestrated or uncuffed tubes are sometimes used in the weaning process. Contact the ENT unit or ICU Liaison Nurse (#5083) for advice on the use of these tubes in weaning.

Note 2: Corking of cuffless or fenestrated small tubes is sometimes used in the weaning process. Please contact the ENT Unit or ICU Liaison Nurse (#5083) for advice on corking.
## APPENDIX 2 - TRACHEOSTOMY CARE RECORD  
**MR - R71**

(Use with graphic chart MR R-60)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Amount/ Type/ Degree of Suction</th>
<th>Body Position</th>
<th>Humidification</th>
<th>Cuff Pressure</th>
<th>Inner Cannula cleaned &amp; inspected</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.9.01</td>
<td>0830</td>
<td>2PB (F) R1 Y 20 Y</td>
<td>R1 Y</td>
<td>20 Y</td>
<td></td>
<td>Y</td>
</tr>
</tbody>
</table>

### KEY

**Sputum**

- Amount
  - 1. Small <10cm
  - 2. Moderate 10-25cm
  - 3. Copious >25cm

- **Type**
  - C-Clear
  - B-Blood
  - P-Purulent

- **Degree of suction**
  - (I) - cough up independently
  - (A) - assisted suction
  - (F) - full suction to lungs

- **Patient Body Position**
  - R= Right
  - L= Left
  - B= Back

  1. Head up 45°
  2. Flat
  3. SOOB

- **Humidification**
  - F&P, HC850 37°

### NURSING CHECKLIST

**EACH SHIFT**

- Respiratory assessment
- Inspect, clean and change inner cannula
- Check cuff pressure 20-25 cmH₂O
- Check suction equipment
- Check emergency equipment

Refer to tracheostomy information booklet for more details.
APPENDIX 3 – TRACHEOSTOMY TUBE STOCK

Portex Double lumen tracheostomy tube stock is located

<table>
<thead>
<tr>
<th>TUBE SIZES</th>
<th>CSSD</th>
<th>ENT THEATRE</th>
<th>ICU</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td>v</td>
<td></td>
</tr>
<tr>
<td>7.5</td>
<td>v</td>
<td>v</td>
<td>v</td>
</tr>
<tr>
<td>8.0</td>
<td>v</td>
<td>v</td>
<td>v</td>
</tr>
<tr>
<td>8.5</td>
<td>v</td>
<td>v</td>
<td>v</td>
</tr>
<tr>
<td>9.0</td>
<td>v</td>
<td>v</td>
<td>v</td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td>v</td>
</tr>
</tbody>
</table>

The most commonly used sizes are 8.0 and 9.0. General wards should access stock from CSSD on an as needs basis. Stock should only be carried on the ward for emergency bedside packs.

Portex Adjustable flange tubes will only be stocked by the ICU and ENT Theatre.

<table>
<thead>
<tr>
<th>TUBE SIZES</th>
<th>ENT THEATRE</th>
<th>ICU</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td>v</td>
</tr>
<tr>
<td>8.0</td>
<td>v</td>
<td>v</td>
</tr>
<tr>
<td>9.0</td>
<td>v</td>
<td>v</td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td>v</td>
</tr>
</tbody>
</table>

Mallinckrodt TracheoSoft reinforced tubes will only be stocked by the ICU and ENT Theatre.

Bivona Foam cuff tubes will only be stocked by the ICU.

The majority of the ENT unit patient population is admitted and cared for on Ward 6 WEST. 6 WEST will therefore carry a limited stock of uncommonly used tubes. For example Shiley tubes, fenestrated tubes or uncuffed tubes.

When planning to insert an uncommonly used tracheostomy tube please plan ahead to ensure the tube of choice is available in the hospital. If you have any queries please contact the ICU Liaison Nurse.