A tracheostomy is the surgical opening into the trachea for the purpose of establishing an airway. When laryngectomy accompanies a tracheostomy:

1) A laryngectomy tube (a shorter version of a tracheostomy tube) may be inserted by the doctor;
2) The patient’s Tracheotomy tube is sutured to the skin surface;
3) Consequently, with a laryngectomy, accidental tube expulsion doesn’t precipitate immediate closure of the tracheal opening.

Once healing occurs, the patient has a permanent neck stoma through which respiration takes place. Whether a tracheostomy is performed in an emergency situation or after careful preparation, as a permanent measure or as a temporary therapy, post-procedure patient care has the same purposes:

1. To promote and assure free passage of air within the tracheo-bronchial tree by preventing encrustation and
clogging of the inner cannula.

2. To facilitate the removal of secretions.

3. To care for tracheostomy or laryngectomy tubes and surrounding skin, preventing infection and promoting healing.

NOTE: Creating a tracheostomy bypasses the upper airway and results in the loss of three protective mechanisms (Frace, 2010):
   a. Warmth
   b. Filtration
   c. Humidification

EXCEPTIONS: Patients requiring deep suctioning are recommended to be placed on the Medical/Respiratory Unit.

DESCRIPTION: Many tracheostomy tubes have a cuff that is inflated after tube placement. The cuff creates a tracheal seal that blocks aspiration and prevents air leakage, an important consideration immediately after tracheostomy or during positive-pressure ventilation.

Tracheostomy tubes may be fenestrated (a window and/or hole is in the outer cannula), un-fenestrated, cuffed and/or un-cuffed.

Extra-long tracheostomy tubes may be indicated per physician preference based on patient’s anatomy/condition (example: Shiley XLT).

Bivona tracheostomy tubes have either foam or water in cuffs; if unsure of brand, consult Respiratory Therapist for follow-up.

Patients may be admitted with a tracheal stoma without a tracheostomy tube present.

For care and maintenance of a Passy Muir Tracheostomy Speaking Valve, refer to policy “Protocol for Passy Muir Tracheostomy Speaking Valve” (126.186).

They may or may not have an inner cannula. The inner cannulas are of two types:

1. **Disposable**: Shiley disposable inner cannulas are indicated by “DCT” on the plate of the outer cannula, and by the “pinching” snap lock mode on the inner cannula; available in sizes 4, 6, 8, and 10.
2. **Reusable**: Inner cannulas are indicated by the “twisting” lock mode on the inner cannula available in sizes 00, 0, 1, 2, 3, 4, 5 (children’s trachs), and 4-10 (for adults).

KNOWLEDGE BASE:

1. For patient safety, a duplicate sterile tracheostomy tube of the same size must be kept at the bedside along with a hemostat readily available, so that, should an obstruction occur or the tube be dislodged, it can be replaced
immediately by another tube. Hemostats can be ordered from Central Service. A resuscitation bag should be at the bedside (at all times) along with a bottle of normal saline. Emergency equipment to be kept at the bedside should also include suction (wall suction) and a red rubber suction catheter.

2. For patients with a tracheal stoma and no tracheostomy tube present, the following equipment is to be kept at the bedside: #4 cuffed non-fenestrated sterile tracheostomy tube, (2) 10-12fr red rubber suction catheter, (2) 14-16fr red rubber suction catheter, bottle of normal saline, hemostats, and an ambu bag.

3. When the patient is being transported to any other department, a new sealed sterile trach tube (same size and type) should accompany the patient in a clean plastic bag at all times.

4. Inform appropriate nursing unit personnel of the presence of a post-tracheostomy patient in the area as this is specifically related to safety and communication needs.

5. To reduce the possibility of contamination, aseptic technique is essential during suctioning and tracheostomy care.

6. If the patient is alert, they must be equipped with a signal light or call bell, and paper and pencil, so that he can communicate with staff.

7. Cotton balls, loose threads from gauze, or other small foreign bodies must be kept away from the tracheostomy opening. Do not cut gauze dressings.

8. During ongoing oxygenation, humidification (which may be heated) with sterile water helps prevent drying of tracheal and bronchial mucosa and the formation of crusts. Patients admitted with a tracheal stoma and no tracheostomy tube present may be required to have humidification.

9. Keep the corrugated tubing below the level of the trachea. This permits condensation to go back into the reservoir and prevents it from running into the trachea. Remove any excess water from the reservoir as needed with the suction provided.

10. When oxygenation is discontinued by the physician, humidification of trach and/or laryngectomy stoma may be achieved by use of an atomizer filled with normal saline (available from Central Service).

11. All tracheostomy patients have some tracheo-bronchial secretions. When they cannot be suctioned out, this may indicate inadequate humidification.
12. It is the physician's responsibility to change the outer cannula unless he/she delegates this responsibility to a respiratory therapy team leader or specialist. If the tube is accidentally expelled, contact Respiratory Therapy STAT. A hemostat may be used to hold the tracheostomy incision open until a duplicate sterile outer cannula can be reinserted with the use of an obturator.

13. If sutures are still in place 7 days post-tracheostomy, the nurse is to call the MD and obtain an order to remove the sutures. (Dennis-Rouse)

14. Tracheostomy care refers to cleaning the site, cleaning/changing the inner cannula, changing the dressing, and suctioning if needed (Dennis-Rouse)

15. Tracheostomy care and stoma site care should be done at a minimum of once every shift and as needed. (Dennis-Rouse)

16. Trach ties need to be changed whenever soiled to avoid compromised skin integrity or as directed by the physician. Always hold tracheostomy in place with one hand while ties are being changed (a second nurse may be needed). Ties are tightened down to one finger space to allow for venous outflow.

17. Secretions should be suctioned and/or coughed out of the trachea on a regular basis as needed and prior to removing the inner cannula during trach care. A physician order is required for deep tracheostomy suctioning. Nursing staff must check the cannula at least every four (4) hours to assess the condition of the cannula. The use of a penlight to detect crustation building up is indicated when the patient presents in respiratory distress and secretions are not able to be suctioned out of tracheostomy. Sterile hemostats can be used to grasp and remove such encrustations visible when only an outer cannula is present. Otherwise, change or clean the inner cannula depending on if it is disposable or reusable, respectively.

**EQUIPMENT:**

**OPEN SUCTIONING TECHNIQUE:**

Assemble the following:

1. Suction catheter kit(s)
   (sterile gloves and catheter of appropriate size*)
   *NOTE: The maximum size of the suction catheter may be estimated by doubling the internal diameter of the airway and adding two (2) (i.e., size 6 tube = 6+6+2 = 14 FR cath). The catheter SHOULD NOT be larger than half the cross sectional diameter of the tube.

2. Sterile saline solution

3. Wall or portable suction apparatus
PROCEDURE: 

OPEN SUCTIONING TECHNIQUE:

1. Identify patient. Ensure that suction apparatus is working properly and the suction pressure is set between 80-120 mm Hg.

2. Position patient appropriately.

3. Perform hand hygiene.

4. Apply protective equipment.

5. Open sterile gloves and catheter on a clean surface, using the inside of the wrapping as a sterile field. Set up the sterile solution container on the sterile field. Be careful not to touch the inside of the container. Fill container with sterile saline or water.

6. **Hyperoxygenate patient:**
   a. **Non-ventilator patient:** Hyperoxygenate patient using resuscitation bag (ambu bag) for 3-5 breaths. It is recommended that two staff members should be utilized. Oxygen flow should be adjusted to fifteen (15) liters per minute and connected to the ambu bag.
   
   b. **Ventilator patient:** It is recommended that closed suctioning be used with ventilator patients. If the patient is on the ventilator, hyperoxygenate for at least 30 seconds by: (1) using the hyperoxygenate button on the ventilator OR (2) increase the FiO2 on the ventilator OR (3) disconnect the patient from the ventilator, attach the resuscitation bag to the endotrachial tube and administer five to six breaths over 30 seconds.

7. Don sterile gloves on both hands. Pick up the suction catheter and attach it to the suction tubing. Take care not to contaminate your hand or the catheter. Occlude the suction port to assess suction pressure which should be set between 80 -120 mm Hg. The amount of suction applied should be only enough to remove secretions effectively. High negative-pressure settings may increase tracheal mucosal damage.

8. Suction immediately.
   a. **SHALLOW SUCTIONING:** Without applying suction and holding the catheter firmly, gently insert the catheter into the tracheal tube no greater than 0.5 to 1 centimeter past the distal end of the outer cannula. (Check the
replacement trach packaging for length of outer cannula to ensure suctioning does not extend greater than 0.5-1 cm past the distal end.) If the patient is coughing, wait until coughing subsides.

• DEEP SUCTIONING (or suctioning of a tracheal stoma with no tracheostomy tube present): Without applying suction and holding the catheter firmly, gently advance the catheter the pre-measured distance needed for insertion (generally length of the adapter plus length of the trach tube). Deep suctioning may be performed on any unit; however, it does require a physician’s order.

b. Rotate the catheter 360° (degrees) between your gloved fingers as you apply intermittent suction and slowly withdraw the catheter. This rotating motion of the catheter prevents the catheter from adhering to the mucosa thus reducing tissue trauma.

c. Remove the catheter using the above procedure within 10 seconds. The incidence of complications markedly increases with increased suction time. Aspirating alveolar oxygen along with secretions may induce hypoxemia and possible cardiac arrhythmias. Additionally, prolonged tracheal suction depletes the oxygen available for arterial transport and can result in alveolar collapse leading in turn to infection.

9. Limit suction to 3 catheter passes. Provide a minimum of 3-5 breaths between passes to allow for re-oxygenation.

10. If a patient requires frequent suctioning, the physician should be contacted.

11. AFTER SUCTIONING, BE SURE TO REAPPLY O₂ CONNECTION. A second flowmeter with an ambu attached should be available in each room so that we are not disconnecting. Remember to decrease the oxygen flow rate to the ordered setting following hyperoxegenation.

12. Clear the connecting tubing with normal saline. Disconnect the catheter from the connecting tubing and discard catheter and gloves.

13. Empty the suction canister as needed wearing personal protective equipment. If changing the suction canister, ensure lid is secure and dispose in general waste if secretions are not bloody. If secretions are bloody, place canister in bio-hazardous red bag.

EQUIPMENT:

CLOSED SUCTIONING TECHNIQUE:
1. Closed-suction setup with a catheter of appropriate size
2. Sterile normal saline
3. Non-sterile gloves
4. Suction source
5. Mechanical ventilator/ambu bag
6. PPE as appropriate

PROCEDURE:

CLOSED SUCTIONING TECHNIQUE (critical care and medical respiratory units):

1. Perform hand hygiene, apply non-sterile gloves.

2. Remove the cap covering the end of the closed suction catheter connected to the ventilator circuit tubing and connect the closed suction catheter to the suction connection tubing.

3. Depress the thumb suction control valve while setting the suction pressure to the desired level which should be no higher than 80 – 120 mm hg. Higher pressures don’t enhance secretion removal and may cause traumatic injury to the tracheal mucosa.

4. Suctioning:
   a. **SHALLOW SUCTIONING**: With one hand keeping the suction system parallel to the patient’s chin, use thumb and index finger of other hand to advance the catheter through the tube and into the patient’s trachea advancing 1-2 cm past the distal end of the outer cannula. (Note: it may be necessary to gently retract the catheter sleeve as catheter advances.)

   b. **DEEP SUCTIONING with a Trach**: Without applying suction and holding the catheter firmly, gently advance the catheter the pre-measured distance needed for insertion (generally length of the adapter plus length of the trach tube) followed by withdrawal of the catheter by 1 cm before application of negative pressure.

   c. **DEEP SUCTIONING with a stoma**: Without applying suction and holding the catheter firmly, gently advance the catheter followed by withdrawal of the catheter by 1 cm before application of negative pressure.

5. Apply intermittent suction and withdraw the catheter until it reaches its full length. Repeat as necessary.

6. Once suctioning is done, flush the catheter by maintaining suction while introducing normal saline solution into the irrigation port.

7. Put the thumb control valve in the off position.

8. The Respiratory Therapist will change the closed suction
system every 3 days and PRN to minimize risk of infection.

CAUTION NOTE: If the patient has a fenestrated tracheostomy tube, always insert the inner cannula prior to suctioning since the catheter could pass into upper oral pharynx causing ineffective suctioning.

EQUIPMENT:

CLEANING NON DISPOSABLE INNER CANNULA:
1. Sterile tracheostomy cleaning tray
   (Contains basins, drape, 4 x 4s or gauze pads, cleaning brush, pipe cleaners, tracheostomy dressing, tracheostomy ties).  
   NOTE: This equipment may be assembled from the nursing unit, if available.

PROCEDURE:

CLEANING NON DISPOSABLE INNER CANNULA:
1. Open hydrogen peroxide and sterile normal saline bottles.
2. Open tracheostomy cleaning tray aseptically.
3. Fill one basin with 3% hydrogen peroxide.
5. Remove reusable inner cannula in an upward and outward arc (must turn to unlock), being careful not to contaminate the inner length of the cannula.
6. Cleanse the inner cannula by submerging it in hydrogen peroxide solution.
   a. A sterile brush or pipe cleaner provided on the tray can be used to remove thick, encrusted secretions. Use sterile-gloved hand to move the brush back and forth through the inner cannula while holding the cannula at the lock connection end with the clean-gloved hand.
   b. Rinse cannula thoroughly with sterile water or saline for 10-20 seconds by pouring over and through inner cannula from the sterile end.
7. Suction outer cannula only if necessary with sterile technique—length of outer cannula only!
8. After shaking off excess water or saline, reinsert inner cannula and twist to lock in place.

EQUIPMENT:

CHANGING DISPOSABLE INNER CANNULA:
1. Disposable inner cannula (from Central Service) sized to trach.
PROCEDURE:

1. Open sterile disposable inner cannula tray aseptically by removing the lid.

2. Perform hand hygiene. Don clean gloves.

   **NOTE:** Sterile gloves are not necessary since sterile portions of the catheter are not touched. Clean gloves are worn to protect self.

3. Unlock (by unsnapping) and remove the disposable inner cannula. Discard.

4. Empty disposable inner cannula tray into hand and pick up sterile DIC by the snap-lock connection end, keeping inner aspect sterile.

5. Replace and snap-lock in place the new sterile DIC.

   **CAUTION NOTE:** Make sure the inner cannula number (size) is the same as the tracheostomy.

EQUIPMENT:

1. Sterile 4X4s
2. Sterile Q-Tips
3. Sterile tracheostomy dressing
4. Sterile gloves
5. Protective skin barrier (i.e., Bard Wipes)
6. Sterile normal saline (bottle)

STOMA CARE:

1. Open packages of sterile 4 x 4s (at least 2) or sterile Q-tips.

2. Open tracheostomy dressing packages(s).

3. Remove soiled dressing and discard.

4. Don sterile gloves if using sterile 4 x 4s to clean stoma. (Gloves are not necessary if Q-tips are used.)

5. Using 4 x 4s or Q-tips, dip sterile gauze in normal saline. Clean stoma site, faceplate of tracheostomy tube, and the adjacent skin.

   a. If unable to adequately clean with normal saline, may use
½ strength hydrogen peroxide (H\textsubscript{2}O\textsubscript{2}) to clean followed by thoroughly cleaning with normal saline to ensure H\textsubscript{2}O\textsubscript{2} has been removed to prevent skin breakdown.

6. Apply protective skin barrier around external stoma – after cleaning.

7. Reapply sterile tracheostomy drain sponge dressing(s). DO NOT use a cut 4 x 4 gauze sponge for a tracheostomy dressing because the edges will fray and provide a potential source of infection (Dennis-Rouse)

**CHANGING TRACH TIES:**

**EQUIPMENT:**
1. Twill tape ties (in sterile trach cleaning tray)
   OR
2. Disposable foam trach ties

**PROCEDURE:**

**CAUTION NOTE:** When changing ties, care must be taken to prevent the patient from coughing out the tube. **TWO NURSES** are needed to do this, or the old tapes may be left in place until the new tapes are secured.

1. Replace ties with clean twill tape or disposable foam trach ties. Secure trach tie with square knots (NEVER USE A BOW) at the side of the neck.

2. Leave tape loose enough to allow one small finger to fit between tape and neck.

**EQUIPMENT:**

**CUFF INFLATION/DEFLATION:**
1. 6- to 12-cc syringe
2. Stethoscope

**PROCEDURE:**

1. A consult and collaboration with respiratory therapy may be indicated regarding cuff inflation and deflation based on physician orders – this will allow for appropriate pressure measurements of the cuff inflation.
   A tracheostomy tube should only be deflated and/or inflated per physician order. **Usually, the cuff will be inflated during meals to prevent aspiration of ingested food.**
   **Prior to deflating the cuff,** the tracheostomy tube should be succioned. (Mitchell et al) Suctioning of the oral pharyngeal cavity may be appropriate to minimize secretions which could descend into the trachea.

2. To gauge **proper inflation** point, use the minimal leak
technique by bagging the patient with a manual resuscitation bag while simultaneously listening with a stethoscope on the neck above the tracheostomy tube. Stop inflating when the leak becomes minimal or first disappears. With minimal cuff inflation, you should feel no air coming from the patient’s mouth, nose, or tracheostomy site, and a conscious patient should not be able to speak.

3. To deflate, insert syringe into the cuff pilot balloon and gently withdraw all air from the cuff, noting the amount.

PATIENT EDUCATION:

1. Explain the purpose and the procedure to the patient.

2. Suctioning: Instruct the patient to take several deep breaths. If he is on a ventilator, initiate several deep respirations (sighs) before suctioning him. Explain that the patient will be hyper-oxygenated with a manual resuscitation bag connected to the trach before and between suction attempts. Sometimes a second person may be needed to assist with the suctioning.

3. If the patient will be discharged with a tracheostomy, patient teaching should include teaching at-home tracheostomy care using clean technique. (Appendix A – “Tracheostomy Supplies Needed to go Home”)

DOCUMENTATION:

Nursing Reassessment: Document the size and type of trach (e.g. Shiley or Bivona) and the date and time of care given and patient’s tolerance of the procedure. Note types of secretions obtained from suctioning or from drainage at tracheostomy site as well as condition of skin. If cuff inflation and deflation are done, note the time and volume of air or pressure obtained. Note any family and patient teaching.

REFERENCE:


APPENDIX A

Tracheostomy supplies needed to go home:

1. **Oxygen source if applicable** – concentrator, liquid, portable
2. **Tracheostomy supplies:**
   - 1 -2 extra tracheostomy tubes in the same size
   - Tracheostomy care kits – cleaning tray (need new one daily)
   - Normal saline or sterile water
   - Normal saline bullets
   - Trach ties or tube holders (need daily)
   - Trach collar
   - Tracheostomy gauze (with cut in it to fit around trach)
   - Inner cannulas (correct size for specific trach)(need daily)
3. **Suction:**
   - Suction machine
   - Collection canister
   - Connective tubing
   - Y-connector
   - Suction catheters (correct size for trach size)(need large supply)
   - Gloves
4. **Humidity:**
   - HME change 1-2 times daily, need large supply
   If no HME is ordered and humidity is requested:
     - 50 PSI machine
     - Corregated tubing
     - Humidity bottles
     - Water collection trap
     - 15 and 20ml adaptors
5. **Nebulizer supplies:**
   - Nebulizers
   - Medication
   - Valved T-adaptor