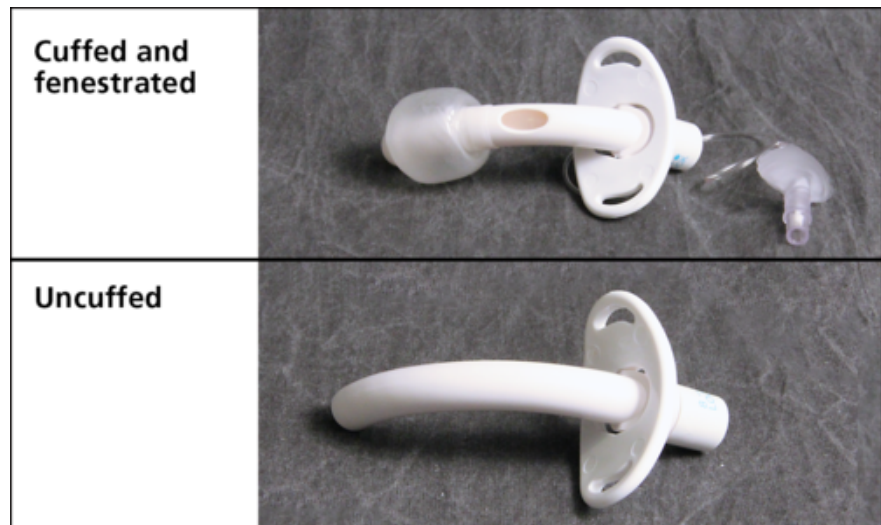


## Tracheostomy Care: Providing

### What is Tracheostomy Care?

› Tracheostomy care involves performing stoma site care, cleansing or replacing the tracheostomy tube (TT) inner cannula every 4–8 hours or as needed, and changing the tracheostomy ties on a regular or as-needed basis. Although tracheostomy care is performed primarily to control the build-up of secretions that can obstruct the artificial airway, it is also necessary to maintain the integrity of the skin at the stoma site, which is prone to inflammation (i.e., stomatitis) and healthcare-associated infection (HAI) particularly during the immediate postsurgical period. This *Nursing Practice & Skill* provides an overview of tracheostomy care procedures. The step-by-step procedure for open- and closed-suctioning of the TT is discussed in *Nursing Practice & Skill ... Tracheostomy Tubes: Suctioning*

- *What:* A tracheostomy (i.e., opening or stoma in the trachea through the anterior neck at the level just below the vocal cords) is created during a surgical tracheotomy procedure. Tracheotomy is preferred over endotracheal intubation for patients who require an artificial airway for > 2–3 weeks, due to the complications associated with ongoing use of an endotracheal tube (ETT), such as the need for sedation, impaired communication, and laryngeal trauma. Additionally, the longer-length ETT, creates greater airway resistance that requires increased work of breathing. Three types of TTs exist (**Figure 1**): *cuffed* (the internal cuff exerts pressure against the tracheal wall to allow for positive pressure ventilation/prevent aspiration), *uncuffed* (permits airflow around the TT), and *fenestrated* (a tube with one or more holes in the outer cannula). TTs are stabilized using a commercial TT holder, which typically consists of a neck flange that attaches to the outer cannula and is held in place using tracheostomy ties. A precut dressing is placed between the patient's skin and the neck flange/TT to absorb secretions and protect the stoma. As the tracheostomy heals, the underlying dressing can become unnecessary



**Figure 1:** Tracheal tubes can be fenestrated, cuffed, and/or uncuffed. Copyright© 2014, EBSCO Information Services.

#### Authors

**Bryan Boling, RN, DNP, CCRN-CSC**  
Cinahl Information Systems, Glendale, CA

**Jennifer Kornusky, RN, MS**  
Cinahl Information Systems, Glendale, CA

#### Reviewers

**Carita Caple, RN, BSN, MSHS**  
Cinahl Information Systems, Glendale, CA

**Alysia Gilreath-Osoff, RN, BSN, CEN, SANE**  
Cinahl Information Systems, Glendale, CA

#### Nursing Practice Council

Glendale Adventist Medical Center,  
Glendale, CA

#### Editor

**Diane Pravikoff, RN, PhD, FAAN**  
Cinahl Information Systems, Glendale, CA

November 17, 2017

## What is the Desired Outcome of Tracheostomy Care?

- › The desired outcome of performing tracheostomy care is promoting airway clearance by removing secretions, and reducing risk of bronchopulmonary infection and skin breakdown

## Why is Performing Tracheostomy Care Important?

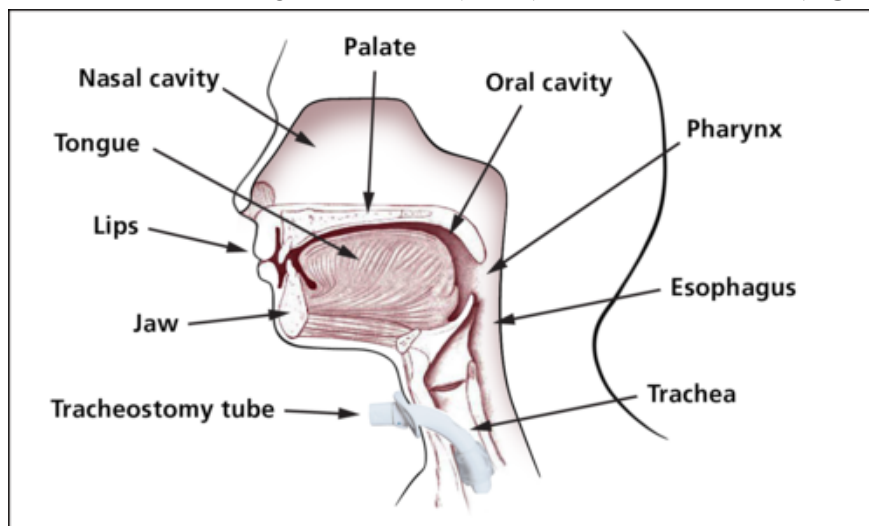
- › Active maintenance of a patent airway is a priority for patients with a TT because the tube bypasses the upper airway, which provides the normal physiological processes of warming, humidifying, and filtering air. Cooler, dry, nonfiltered air can cause secretions to increase and thicken. Also, secretions thicken in response to postsurgical inflammation and the presence of the TT
- › Tracheostomy care aims to prevent
  - build-up of secretions within the cannula that can thicken and obstruct the airway
  - skin breakdown at the stoma site. The risk for skin breakdown is greatest in the 48 hours following tracheotomy, before the tracheostomy tract is fully formed—fibroblast activation in response to an infection or immune response can lead to development of granulation tissue
  - accumulation of biofilm bacteria (i.e., network of bacteria that is connected by a surrounding matrix of extracellular polymeric substance) on the inner surface of the cannula, which can lead to bronchopulmonary infection if aspirated
  - inadvertent tube dislodgement, in that it provides an opportunity to evaluate the condition of the tube holder and change or re-secure tracheostomy ties as necessary

## Facts and Figures

- › In hospitals in the United States, HAIs affect 1 in 25 patients. An estimated 722,000 HAIs were reported in acute care facilities in the U.S. in 2011. Pneumonia, including ventilator-associated pneumonia, represented 21.8% of the reported HAIs (CDC, 2016)
- › Investigators who compared TT cleaning techniques reported that manual brushing with tap water reduced microbial colonization by an average of 10(2) CFU/mL, but complete microbial reduction was achieved with additional chemical or machine-based thermal disinfection (Leonhard et al., 2016)

## What You Need to Know Before Providing Tracheostomy Care

- › Prior to providing tracheostomy care, the clinician should have knowledge of the following:
  - Upper airway anatomy relevant to placement and securement of the
    - During the tracheotomy procedure, an incision is made below the cricoid cartilage through the second, third, or fourth tracheal rings. The TT is then inserted through the incision (stoma) and into the trachea (**Figure 2**)



**Figure 2:** Schematic diagram of the neck profile of a completed tracheostomy. This image is in the public domain in the United States

- TTs are curved cannula that are shorter in length than ETTs. The outer cannula forms the body of the TT and, if cuffed, contains the cuff at its proximal end and neck flange attachment at the distal end. The inner cannula, if present, is the component that is removed during tracheostomy care for cleaning or replacement

- Cuffed tubes are used for the majority of acutely ill adult patients, particularly for those who are mechanically ventilated because the balloon-inflated cuff maintains a seal around the tube to permit closed-circuit ventilation and prevent aspiration of oral and gastric secretions. The cuff is inflated by instilling air through the one-way inflation valve; the external pilot balloon inflates in proportion to the cuff and serves as an indicator of the volume of air that has been instilled. Deflating the cuff permits speech (using either the finger occlusion technique or a Passy-Muir valve) and is used when weaning from a ventilator because it allows the patient to breath around the tube and through the stoma
- When caring for a patient with a cuffed TT, it is important to monitor cuff pressure, keeping the cuff inflation pressure as low as possible to reduce the risk of injury to tracheal tissue while maintaining an optimal seal **(Figure 3)**



**Figure 3:** Monitor tracheostomy cuff pressure with a pressure manometer. Copyright© 2014, EBSCO Information Services.

- The inner cannula is inserted into the outer cannula and locked into place. Typically, sterile disposable inner cannulas are used in the inpatient setting because of the increased risk of HAIs; nondisposable inner cannulas that require cleaning are more common in the outpatient or long-term care setting
- Tracheostomy ties or a commercially manufactured holder are used to secure the TT. A tie, securing the TT, is placed behind the patient's neck and laced through holes on opposite sides of the neck flange. It is appropriate to obtain assistance from a second clinician to hold the TT securely if it is necessary to release the tracheostomy ties (e.g., to clean/replace the flange, change the underlying dressing, or replace the ties). In some facilities, two layers of ties are used—one which is an adjustable collar that is secured with Velcro straps and a second tie composed of a ribbon-like cotton tied in a square knot. The collar forms the first layer around the patient's neck, and the cotton ties are positioned over the collar as a second form of securement so that during a tie change, at least one layer remains in place at all times to prevent inadvertent TT dislodgement
- Aseptic technique
  - In the acute care setting it is essential to utilize appropriate aseptic technique when performing tracheostomy care to minimize risk for infection at the stoma site and bronchopulmonary infection. In most tracheostomy care procedures except suctioning, it is appropriate to use aseptic non-touch technique (**ANTT**; i.e., a form of aseptic technique that utilizes measures to prevent the sterile part of the equipment or medication/solution from touching anything that is not sterile prior to introduction into the patient). Clean technique can be utilized by caregivers in the long-term or home care setting for certain aspects of tracheostomy care, after the stoma has healed
- Mechanical ventilation and oxygen delivery systems
  - It is appropriate to hyperoxygenate the patient prior to disconnecting him/her from the ventilator or humidification device (T-piece or tracheostomy collar) for the brief time it takes to perform tracheostomy care, or at least long enough to replace the inner cannula if the patient requires continuous ventilation. It is important to have the following supplies readily available in the event of desaturation or inadvertent TT dislodgement:
    - TT with obturator (used to introduce the tube)
    - Bag-valve mask (**BVM**) device within reach—the mask is removed for attachment to the TT
- tracheal suctioning and pulmonary toileting procedures (i.e., a group of therapies such as chest physiotherapy and percussion that are used to clear secretions from the airways) are critical to reduce the risk of airway obstruction
- Skin, respiratory, and pain assessment skills. For details, see *Nursing Practice & Skill ... Physical Assessment: Head-to-Toe -- Performing*

- TT components and related supplies
- Preliminary steps that should be performed prior to providing tracheostomy care include the following:
  - Review the facility/unit-specific protocols for specific aspects of tracheostomy care, if these are available
  - Review the treating clinician’s orders for tracheostomy care. Note: General tracheostomy care does not require a written order; however, the treating clinician may have prescribed use of medication or specialized dressing
  - Verify completion of facility informed consent documents, if necessary. Typically, the general consent for treatment that is executed by patients at admission to a healthcare facility includes standard provisions that encompass tracheostomy care
  - Review the patient’s medical history/medical record for
    - date tracheotomy was performed
    - previous assessments of the tracheostomy site
    - type and size TT in use
    - any allergies (e.g., to latex, medications, or other substances); use alternative materials, as appropriate
- Gather supplies, which typically include the following—some items can be available in a commercial tracheostomy care kit:
  - Nonsterile gloves, sterile gloves, and other personal protective equipment (**PPE**; e.g., gown, eye shield) can be necessary depending on the need for special precautions or if exposure to body fluids is anticipated
  - Facility-approved pain assessment tool
  - Analgesic, if prescribed for administration prior to tracheotomy care
  - Equipment for monitoring vital signs and oxygen saturation(e.g., stethoscope, pulse oximeter)
  - Sterile water for stoma site care and for cleaning non-disposable inner cannula
  - Sterile containers, if not using a prepackaged tracheostomy kit (which has sterile compartments that can be filled with sterile water)
  - Sterile cotton-tipped swabs
  - Sterile 4 x 4 gauze pads
  - Commercially-prepared, sterile precut tracheostomy dressing or pre-cut (split sponge) gauze; avoid use of woven cotton dressings because lint or cotton fibers can be aspirated or become embedded in the stoma
  - Sterile disposable inner cannula of appropriate size, optional
  - Supplies for suctioning the TT (e.g., suction apparatus, suction catheters of appropriate size, sterile water, sterile gloves)
  - Small percolator brush, inner cannula brush, or sterile pipe cleaner
  - Tracheostomy ties (e.g., adjustable Velcro-secured collar and/or ribbon-like cotton of appropriate length)
  - Scissors
  - 2 replacement TTs of same type as the one inserted (one of same size and the other one size smaller) and obturator in a readily available location
  - BVM

## How to Provide Tracheostomy Care

- › Perform hand hygiene and don PPE
- › Identify the patient using two unique identifiers or according to facility protocol
- › Establish privacy by closing the door to the patient’s room and/or drawing the curtain surrounding the patient’s bed
- › Introduce yourself to the patient and family member(s) and explain your clinical role
- › Assess the patient and family for knowledge deficits and anxiety regarding tracheostomy care
  - Determine if the patient/family requires special considerations regarding communication (e.g., due to illiteracy, language barriers, or deafness); arrange to meet these needs if they are present
    - Use a professional certified medical interpreter when a communication barrier exists
  - Assess the patient’s understanding of and previous experience with the procedure; explain the tracheostomy care procedure to the patient and patient’s family; answer questions and provide emotional support, as needed
- › Assess the patient’s general health status, including his/her level of pain using a facility-approved pain assessment tool; administer analgesia, as prescribed (e.g., if the tracheostomy is new and the site is painful or tender), and allow time for therapeutic level to be reached before proceeding with tracheostomy care
  - Assess vital signs
  - Auscultate breath sounds, check oxygenation settings and oxygen saturation, and check for proper TT cuff inflation (for more information, see *Nursing Practice & Skill ... Tracheal Tube Cuff Care: Performing Cuff Inflation and Deflation* )
  - Assess for anxiety or agitation as a potential sign of discomfort or difficulty breathing

- › Reposition the patient for comfort and for accessibility to the tracheostomy site. To increase accessibility to the tracheostomy site, some clinicians remove any pillows and, if not contraindicated, place a small rolled towel behind the patient's neck to gently hyperextend the neck
- › Prior to performing tracheostomy care, hyperoxygenate the patient and suction the TT using appropriate aseptic technique. For more information, see *Nursing Practice & Skill ... Tracheostomy Tubes: Suctioning*, referenced above
- › Prior to removal, check the tracheostomy dressing to verify it has not adhered to the stoma. If necessary, moisten the dressing with sterile water to soften dried tissue to facilitate removal
- › Remove the existing tracheostomy dressing. Assess the wound drainage, noting the *type* of drainage (e.g., serous, sanguineous, serosanguineous, seropurulent, purulent), *amount/quantity*, *consistency*, and *odor* (for more information see *Nursing Practice & Skill ... Wound Therapy, Performing: Drainage* )
- › Discard soiled dressing and gloves in biohazard container
- › Perform hand hygiene
- › Replace or clean the inner cannula
  - To replace a disposable inner cannula, perform the following steps:
    - Open disposable inner cannula package but do not remove cannula
    - Don nonsterile gloves
    - Remove humidification from source or detach ventilator from TT
    - Detach existing inner cannula from outer cannula by rotating adaptor counterclockwise or by squeezing the lock connector, which will detach the inner cannula from the outer cannula, and then remove inner cannula and discard
    - Remove new, sterile inner cannula from packaging by grasping it by the adaptor/connector. Do not touch the cannula itself to avoid contamination
    - Insert the new, sterile inner cannula into the outer cannula, following the curve of the outer cannula until fully seated, and then rotate the adaptor clockwise to lock into place
    - Reapply humidification source or reattach ventilator to TT
  - To clean non-disposable inner cannula, perform the following steps (**Figure 4**) :
    - Open tracheostomy care kit (or individual packages of supplies) onto a sterile field. Pour sterile water into two separate sterile containers or compartments of the tracheostomy care kit—one compartment for cleansing, the second for rinsing
    - Don sterile gloves
    - Remove existing inner cannula and immerse in sterile water. Position humidification and/or oxygen source close to outer cannula until procedure is completed to maintain oxygen supply
      - Work quickly to avoid prolonged time off the ventilator or oxygenation/humidification source. If the patient cannot tolerate disconnection from ventilator/oxygen source, insert new inner cannula and reattach oxygen source, and then clean soiled cannula and store in sterile container for later use
    - Insert percolator brush, inner cannula brush, or sterile pipe cleaner into cannula and use a scrubbing motion to cleanse the cannula
    - Immerse inner cannula in second container/compartments of sterile water and agitate it to rinse it thoroughly
    - Repeat cleaning if necessary. Once clean, tap against side of container to remove excess solution and allow to dry, and then reinsert inner cannula into outer cannula as described above and lock into place
    - Reattach humidification source or ventilator





**Figure 4:** Use a brush to clean the reusable inner cannula of a tracheostomy tube. Copyright© 2014, EBSCO Information Services.

- › Perform stoma site care
- ›
  - Perform hand hygiene and don nonsterile gloves
  - Using gauze slightly dampened with sterile water to cleanse the patient’s neck (under the flange and tracheostomy ties)
  - Inspect the stoma and drainage on the gauze for evidence of infection (e.g., erythema, edema, malodorous and/or purulent drainage) or bleeding
  - Use multiple, slightly dampened gauze pads or cotton-tipped applicators to cleanse the stoma and skin beneath the flange, using each gauze or cotton-tipped applicator for a single pass before discarding
  - Pat skin dry using dry gauze, and then replace tracheostomy dressing beneath the flange; verify the dressing does not cover the TT opening
  - Discard gloves and perform hand hygiene
- › Evaluate the fit of the flange and tracheostomy ties—one or two fingers should easily fit between the tie and the neck and the patient is able to flex the neck comfortably. Obtain assistance from a second clinician if ties must be adjusted or replaced (if wet or soiled)
- ›
  - Perform hand hygiene and don nonsterile gloves
  - Cut new tracheostomy ties to the appropriate length (i.e., fit around the patient’s neck twice with sufficient length to complete a square knot), if needed, cutting the ends of the ties at an angle to prevent fraying and to ease threading the tie through the opening in the flange
  - Partner with colleague to attach new ties prior to removing the old ones and secure around the patient’s neck
    - Enlist a second clinician to hold the TT in place while ties are removed to reduce risk for inadvertent dislodgment
- › Reposition the patient for comfort and reassess the patient’s respiratory status
- › Discard disposable materials appropriately
- › Discard gloves and perform hand hygiene
- › Update the patient’s plan of care, as appropriate, and document the following information in the patient’s medical record:
  - Date and time the tracheostomy care procedure was performed
  - Description of the procedure
  - Patient assessment information, including
    - vital signs, pain assessment findings, and general physical and oxygenation status
    - condition of the stoma and surrounding skin
    - volume and characteristics of any drainage at the stoma site
    - position and condition of the TT, including cuff pressure, and any adjustments that were made
    - if suctioning was performed, description of color, consistency, volume, and any malodor of the suctioned secretions
  - Patient’s tolerance of the procedure
  - Any unexpected patient events or outcomes, interventions performed, and if the treating clinician was notified

- All patient/family education, including topics presented, response to education provided/discussed, plan for follow-up education, and details regarding any barriers to communication and/or techniques that promoted successful communication

## Other Tests, Treatments, or Procedures That Can Be Necessary Before or After Tracheostomy Care

- › Tracheostomy care should be repeated every 4–8 hours, as needed, with suctioning performed prior to changing/cleaning the inner cannula, and as needed depending upon the volume and consistency of secretions
- › Notify the treating clinician of abnormalities detected during tracheostomy care (e.g., malodorous drainage or other signs and symptoms of infection)

## What to Expect After Tracheostomy Care

- › The patient's airway will remain patent and his/her respiratory status will be stable, and the patient will remain free of tracheostomy-related complications

## Red Flags

- › Emergency equipment must be accessible and near the patient with a tracheostomy in the inpatient setting. This includes suction device, suction catheters, bag-valve mask, oxygen source, spare tracheostomy tube, tracheal dilators, and a tracheostomy disconnection wedge and suture scissors
- › Pink, frothy secretions can be indicative of pulmonary edema. Suctioning or changing the TT inner cannula can be contraindicated in these patients unless necessary and under direction of the treating physician
- › Significant changes in the appearance of the patient's airway secretions should prompt a call to the treating clinician to request an order for laboratory culture for microorganisms
- › Complications associated with tracheostomy include aspiration, infection, airway obstruction due to secretions, laryngeal trauma, dysphagia, and tracheal stenosis

## What Do I Need to Tell the Patient/Patient's Family?

- › Reinforce the importance of regular tracheostomy care to maintain a patent airway with adequate air flow
- › Provide resources for education and home health care for patients and families of patients who will be discharged home with a TT in place. Educate the patient/patient's family to immediately report swelling of the trachea, signs of infection (e.g., erythema, purulent drainage, edema), or bleeding from the tracheostomy or stoma for prompt medical assessment and treatment

---

## References

- Centers for Disease Control and Prevention. (2016, May 27). Healthcare-associated infections (HAI). Retrieved July 31, 2017, from <http://www.cdc.gov/hai/> (GI)
- Centers for Disease Control and Prevention. (2016, October 25). HAI Data and statistics. Retrieved July 31, 2017, from <https://www.cdc.gov/hai/surveillance/index.html> (GI)
- Johnson, R. (2017). Tracheostomy cuff and tube care. In D. L. Wiegand (Ed.), *ACCN procedure manual for high acuity, progressive, and critical care* (7th ed., pp. 89-102). St. Louis, MO: Elsevier. (PP)
- Leonhard, M., Assadian, O., Zumtobel, M., ... Schneider-Stickler, B. (2016). Microbiological evaluation of different reprocessing methods for cuffed and un-cuffed tracheostomy tubes in home-care and hospital setting. *GMS Hygiene and Infection Control*, 11, Doc02. doi:10.3205/dgkh000262 (R)
- Lynn, P. (2015). Providing care of a tracheostomy tube. In *Taylor's handbook of clinical nursing skills* (4th ed., pp. 826-834). Philadelphia, PA: Wolters Kluwer Health/Lippincott Williams & Wilkins. (GI)
- Nance-Floyd, B. (2011). Tracheostomy care: An evidence-based guide to suctioning and dressing changes. *American Nurse Today*, 6(7), 14-16. Retrieved from <https://www.americannursetoday.com/tracheostomy-care-an-evidence-based-guide-to-suctioning-and-dressing-changes/> (RV)
- St George's Healthcare NHS Trust. (2012). Guidelines for the care of patients with tracheostomy tubes. Retrieved June 15, 2017, from <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&ved=0ahUKEwiO2NThiMDUAhXB2T4KHQo0DSkQFghCMAQ&url=https%3A%2F%2Fwww.rcplondon.ac.uk%2Ffile%2F2021%2Fdownload%3Ftoken%3DvsTn9xVo&usq=AFQjCNEorcLG15Zpa8zf6unm9djWh0vpKg> (G)
- Wright-Boon, C. J. (2018). Airway management. In A. G. Perry, P. A. Potter, & W. R. Ostendorf (Eds.), *Clinical nursing skills & techniques* (9th ed., pp. 696-704). St. Louis, MO: Mosby Elsevier. (PP)