

## ARTIFICIAL AIRWAY - ICU

- PURPOSE:** To outline the management of patients with an artificial airway in the Intensive Care Unit.
- SUPPORTIVE DATA:** Tracheostomy tube and oral/nasal endotracheal tube (ETT) are examples of artificial airways.
- Pulsating tracheostomy indicates close proximity of the trachea to an artery. This proximity may lead to erosion and an arterial bleed. Over inflation of ETT or tracheostomy tube cuff may lead to a tracheal injury.
- Normal saline lavage with suctioning may be harmful and may not effectively loosen secretions. Therefore, routine normal saline lavage is not recommended.
- Shallow suctioning (as opposed to deep suctioning) is recommended (e.g. the catheter should be inserted to the end of the artificial airway rather than “until resistance is met”).
- A securing device is always used for the artificial airways.
- Endotracheal Tubes:**  
The endotracheal tube fastener device (with ability to reposition tube) may be used for adult patients unless:
- ETT is expected to be in place for less than 24 hours
  - Patient has wounds/burns on the face
  - Patient’s head is too small
  - Patient lacks supportive facial structure (e.g. patient is gaunt)
  - Hair on cheek or above lip cannot be removed
- If this ETT fastener is not used, another approved method must be used.
- Nursing and Respiratory Care share the responsibility for suctioning, changing ETT securing device and repositioning the ETT. Good communication between Nursing and Respiratory Care is essential to ensure these activities are performed and documented.
- Tracheostomy Tubes:**  
There are several types of tracheostomy tubes. Cuffed tubes have a cuff or balloon which exerts pressure against the tracheal wall. The cuff must be inflated while the patient is being mechanically ventilated.
- When the patient is not receiving mechanical ventilation, it is desirable for the cuff to be deflated in order for the patient to breathe through as well as around the tube. The cuff should be deflated unless there is a specific provider’s order not to. The patient is at increased risk of obstruction due to mucous plug in the tube if the cuff is not deflated.
- Uncuffed tubes do not have a balloon and allow for air flow around the tracheostomy tube.
- Tracheostomy tubes also may be fenestrated, meaning that they have one or more openings above the cuff. When the cuff is deflated, the inner cannula is removed, and the opening of the tracheostomy tube is occluded, so that the patient may move air via the upper airway through the fenestration(s). Therefore, patient’s ability to breathe normally can be assessed prior to removing the trach, and also the patient can speak.
- Non-ventilated patients who have been transitioned to fenestrated trach tubes and require mechanical ventilation must be returned to a non-fenestrated trach tube.

When patients are admitted from home with fenestrated trach tubes, they must be placed on a hospital owned mechanical ventilator, consult with Respiratory Care Services to ensure the patient can be adequately ventilated with their existing airway. Per Respiratory Care Service's standards:

- If the tracheostomy tube is **cuffless**, activate "**Leak Sync**" upon ICU admission
- In the event of deteriorating condition, assess for the need to change the tracheostomy tube to a cuffed airway and consult the admitting team to order and facilitate

The following are types of tracheostomy tubes used at the medical center and their acronyms:

LPC: Tracheostomy Tube Cuffed with Inner Cannula

FEN: Tracheostomy Tube Cuffed with Inner Cannula Fenestrated

CFS: Tracheostomy Tube Cuffless with Inner Cannula

CFN: Tracheostomy Tube Cuffless with Inner Cannula Fenestrated

**ASSESSMENT:**

1. Assess the following upon initiation and beginning of shift:
  - ETT size and placement
    - Location in (cm) at: teeth, lips, nares, ETT holders
    - Properly secured
2. Assess the following (at beginning of shift) and a minimum of every 2 hours
  - Vital Signs (especially respiratory rate)
  - Use of accessory muscles, retractions, nasal flaring
  - Oxygen saturation
  - Need for suctioning
3. Assess the following (at beginning of shift) and a minimum of every 4 hours:
  - Respiratory pattern
  - Breath sounds
  - Chest expansion, symmetry of chest movement
  - Secretions: quantity, color, characteristics
  - Cough
  - Skin and nail bed color
  - ETT placement:
    - Location in (cm) at: teeth, lips, nares, ETT holders
    - Properly secured
  - For pressure injuries
  - Nasal ETT for signs/symptoms of sinusitis
    - Drainage
    - Fever
  - Tracheostomy:
    - Condition of tracheostomy site and skin under trach holder
    - Condition of suture sites (if present)
    - For presence of
      - Neck edema
      - Pulsation of tracheostomy site
      - Presence of cuff leak
      - Signs/symptoms of infection
4. Monitor for the following continuously as ordered:
  - Oxygen saturation via pulse oximeter
  - End-tidal carbon dioxide (ETCO<sub>2</sub>)
  - Transcutaneous carbon dioxide monitor (TCO<sub>2</sub>)- NICU
  - Transcutaneous oxygen monitor (TO<sub>2</sub>)- NICU

**SUCTIONING:**

5. Pre-oxygenate prior to suctioning.

6. Suction artificial airway and mouth at the beginning of each shift and as indicated by the following:
  - Coarse breath sounds/rhonchi present
  - Unexplained respiratory distress
  - Noisy breathing
  - Audible secretions
  - Secretions present in the tubing
  - Increased peak inspiratory pressure or high-pressure alarm on ventilator
  - Increased RR, HR and BP
  - Decreased oxygen saturation per pulse oximeter
7. Monitor for signs and symptoms of hypoxia during suctioning, including:
  - Decrease in oxygen saturation
  - Tachycardia, bradycardia, arrhythmias
  - Agitation
  - Pallor, diaphoresis

REPOSITIONABLE  
FASTENER  
DEVICE:

8. Reposition ETT via fastener device every 2 hours.  
Replace fastener (utilizing 2 people) as needed and every 3 days.
  - Clean skin (avoid soap with lotion)
  - Shave upper lip and cheeks as needed
  - Verify device is secure (i.e., adhesive pads are sticking, if applicable)
  - Ensure device is not too tight (should be able to insert 2-3 fingers under strap)
9. Replace strap as needed (e.g., when soiled)
10. Ensure NGT or OGT is not secured through bite block or holder

OTHER APPROVED  
SECURING  
METHOD:

11. Retape ETT (utilizing 2 people) a minimum of every 24 hours or when loose or soiled:
  - Reposition oral ETT to prevent ulceration
  - Clean/replace/reposition oral airway (if present)  
Exception: Pediatrics, Change ETT holder and tape ONLY when loose or soiled
12. Inspect skin integrity under fastener device/ securing method when changed

TRACHEOSTOMY  
TUBE CARE:

13. Clean tracheostomy site every 8 hours or more frequently if soiled.
14. Clean non-disposable inner cannula every 8 hours with 1:1 hydrogen peroxide and normal saline mixture and rinse with normal saline or with solution as ordered. Hold plate to stabilize tracheostomy tube while removing and replacing inner cannula.
15. Change disposable inner cannula with same size cannula a minimum of every 24 hours and as needed (e.g., if patient has large amount or thick secretions).
16. Change tracheostomy holder:
  - Every 24 hours and more frequently if soiled (NICU, only if soiled)
  - If new tracheostomy, see Provider Order
17. Change foam dressing when soiled:
  - Small foam dressing is used when sutures are present for new tracheostomy. 1<sup>st</sup> dressing change to be done by the Provider. (Large fenestrated foam dressing may be trimmed to fit)
  - Large fenestrated foam is used after sutures are removed

SAFETY:

18. Ensure the following equipment is always at the bedside:
  - Complete suction set-up
  - Bag valve mask (BVM) with oxygen source
  - For infants less than 5 kg
    - Infant self-inflating bag OR T-piece resuscitator
    - Attached elbow with inline pressure manometer with safety devices
    - Appropriate mask size
  - For tracheostomy:
    - Obturator in plastic bag
    - Extra tracheostomy tube kit (with same size tube)
19. Provide safety measures for patients whose mental status or developmental age precludes

cooperation with airway maintenance (Peds).

ORAL HYGIENE: 20. Provide oral care a minimum of every 4 hours while awake.  
COMMUNI-CATION 21. Communicate with patient a minimum of every 2 hours regarding needs.  
NEEDS: 22. Assist patient in developing alternate non-verbal communication and encourage expression of feelings/concerns (e.g., communication board).

EMERGENCY 23. Provide the following emergency care if accidental ETT extubation occurs:  
MANAGEMENT: 

- Assess patient's ability to maintain effective ventilation
- Provide oxygen support to maintain oxygen saturation greater than 95%
- Use resuscitation bag with mask if ventilation is ineffective
- Notify provider

24. Reinsert new tracheostomy tube to reestablish airway patency for accidental tracheostomy removal.  
25. Change tracheostomy tube if occluded. The following are exceptions: 

- Provider must change tracheostomy tube if patient has:
  - New tracheostomy
  - Short, thick neck
  - Known tracheoesophageal pathology

PATIENT/ 26. Instruct patient/family regarding the following:  
CAREGIVER 

- Purpose of artificial airway
- Report respiratory distress to nurse
- Method of cleaning non-disposable inner cannula (if appropriate)
- Alternate methods of communication

  
EDUCATION:

COLLABORATION: 27. Collaborate with other disciplines as indicated: 

- Respiratory Care Practitioners
- Food and Nutrition Services

REPORTABLE 28. Notify Provider of the following:  
CONDITIONS: 

- Air leak
- Tube occlusion/dislodgement
- Signs/symptoms of respiratory distress
- Signs/symptoms sinusitis with nasal ETT
- Neck edema
- New tracheostomy: for tight trach ties or sutures
- Signs/symptoms tracheostomy site/ suture site infection:
  - Fever
  - Redness
  - Purulent secretions/ drainage
  - Edema
- Tracheostomy site for:
  - Pressure injury or wound
  - Bleeding or pulsation

29. Notify Provider if sutures not removed within 7 days post tracheostomy insertion.

ADDITIONAL 30. Implement the following as indicated:  
STANDARDS: 

- Mechanical Ventilation - ICU
- Oxygen Therapy
- Restraints
- Sedation and Analgesia (Intravenous) – ICU
- Mechanical Ventilation, Alternative Modes – ICU
- Tracheostomy Tube – Acute Care Units
- Intravenous Therapy
- Central lines

DOCUMENTATION: 31. Document in accordance with documentation standards including the following in iView,

Systems Assessment, customize add Artificial Airway management, add dynamic group labeling appropriately.

- ETT repositioning
- ETT position
- ETT fastener/holder change
- Tracheostomy care

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