ARTIFICIAL AIRWAY

PURPOSE: To outline the management of patients with an artificial airway.

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. Overinflation of ETT or tracheostomy tube cuff may lead to a tracheal injury.

Normal saline lavage with suctioning may be harmful and may not 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).

ETTs with a subglottic suction port assist in reducing the accumulation of secretions above the cuff.

ASSESSMENT:

1. Assess the following a minimum of every 4 hours:
   - Vital signs
   - Respiratory rate, pattern
   - Breath sounds
   - Chest expansion
   - Use of accessory muscles, retractions, nasal flaring
   - Secretions: quantity, color, characteristics
   - Cough
   - Skin and nail bed color
   - ETT placement:
     - Location in (cm) at: teeth, lips, nares, ETT holders
     - Securely taped
   - For pressure sores
   - Nasal ETT for signs/symptoms of sinusitis
     - Drainage
     - Fever
   - Suture sites (if visible):
     - New tracheostomy
   - Pulsation of tracheostomy tube
2. Assess for cuff leak a minimum of every 4 hours.
3. Assess for the need for suctioning a minimum of every 2 hours
4. Monitor for the following continually as ordered:
   - Oxygen saturation via pulse oximeter
   - End-tidal carbon dioxide ($ETCO_2$)
   - Transcutaneous carbon dioxide monitor (T CO_2 M) - Peds

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:
   - Course breath sounds/rhonchi present
   - Unexplained respiratory distress
   - Noisy breathing
   - Audible secretions
   - Secretion 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
   - Agitation
   - Pallor, diaphoresis

SUBGLOTTIC SUCTION:

8. Ensure suction lumen of ETT with subglottic suction capability is connected to one of the following:
   - 20-30 cm H_2O continuous suction (preferred)
   - 100-150 cm H_2O intermittent suction

9. Aspirate secretions from suction port with $\geq$ 10 ml syringe every 4 hours if suction machine is not available.
10. Instill 3-5 ml air into suction lumen if a blockage of the lumen is suspected.
11. Cap suction lumen when not connected to suction (e.g., during transport).

ENDOTRACHEAL TUBE CARE:

12. Retape ETT a minimum of every 24 hours or when loose or soiled:
    - Reposition oral ETT to prevent ulceration
    - Change ETT holder and tape ONLY when loose or soiled (Peds)
    - Clean/replace/reposition oral airway
13. Secure ETT with securing device

TRACHEOSTOMY TUBE CARE:

14. Clean tracheostomy site every 8 hours or more frequently if soiled.
15. Clean non-disposable inner cannula every 8 hours with hydrogen peroxide and saline.
16. Change disposable inner cannula with same size cannula when soiled or at least every 72 hours.
17. Change tracheostomy ties:
    - Every 24 hours or more frequently if soiled
    - If new tracheostomy, see Physicians Order

AFETY:

18. Ensure the following equipment is at the bedside at all times:
    - Complete suction set-up
    - Manual resuscitation bag
    - For infants less than 5 kg
      - Anesthesia bag
      - Attached elbow with inline pressure manometer with safety devices
      - Appropriate mask size
    - Obturator in plastic bag and taped to bed
    - Extra tracheostomy tube (same size) with obturator
19. Ensure that suction lumen of ETT is used ONLY for suction/aspiration of secretions.
20. Provide safety measures for patients whose mental status or developmental age precludes cooperation with airway maintenance (Peds).

ORAL HYGIENE:

21. Provide oral care a minimum of every 4 hours while awake.

COMMUNI-CATION NEEDS:

22. Communicate with patient a minimum of every 4 hours regarding needs (ICU every 2 hours).
23. Assist patient in developing alternate non-verbal communication and encourage expression of feelings/concerns (e.g., communication board).

EMERGENCY MANAGEMENT:

24. Provide the following emergency care if accidental ETT extubation occurs:
    - 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 physician
25. Reinsert new tracheostomy tube to reestablish airway patency for accidental tracheostomy removal.
26. Change tracheostomy tube if occluded. The following are exceptions:
    - Physician must change tracheostomy tube if patient has:
      - New tracheostomy
      - Short fat neck
      - Known tracheoesophageal pathology

PATIENT/ FAMILY TEACHING:

27. Instruct patient/family regarding the following:
    - Purpose of artificial airway
    - Report respiratory distress to nurse
    - Method of cleaning non-disposable inner cannula (if appropriate)
    - Alternate methods of communication

COLLABORATION:

28. Collaborate with other disciplines as indicated:
    - Respiratory therapy
    - Food and Nutrition Services

REPORTABLE CONDITIONS:

29. Notify physician of the following:
    - Air leak
    - Tube occlusion/dislodgement
    - Signs/symptoms sinusitis with nasal ETT
    - Tracheostomy site bleeding or pulsation
    - Signs/symptoms tracheostomy site infection:
        - Fever
        - Redness
        - Purulent secretions/drainage
30. Notify physician if sutures not removed after 72 hours on new tracheostomies (Peds after one week).

ADDITIONAL PROTOCOLS:

31. Implement the following as indicated:
    - Mechanical Ventilation
    - Oxygen Therapy
    - Restraints
    - Sedation and Analgesia (Intravenous) – ICU
    - Ventilatory Modes, Alternate - ICU

DOCUMENTATION:

32. Document in accordance with documentation standards.

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Initial date approved: 08/03	Reviewed and approved by: Critical Care Committee Professional Practice Committee Pharmacy & Therapeutic Committee Nurse Executive Council Attending Staff Association Executive Committee	Revision Date: 11/94, 01/00, 10/00, 03/05, 03/08, 10/10

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