Providence Health Care	Department: Respiratory Services	Date Originated: September 1986 Date Reviewed/Revised: **January 2009**
PROCEDURE	Topic: Critical Care – Suction and Instillation: Ventilated Patients Using an Open Catheter Technique (Respiratory Therapy) Number: B-00-12-12017	Related Links:

APPLICABLE SITES:

St. Paul's Hospital
Mount Saint Joseph Hospital

GENERAL INFORMATION:

Suctioning of airways should only be performed if clinically indicated and not as a routine, fixed-schedule therapy. However, the suction catheter should be passed through the artificial airway every 12 hours to assess and ensure patency of the airway.

Suctioning is necessary for patients with artificial airways. When clinical indicators of the need for suctioning are present, there is no absolute contraindication to suctioning.

Hyperoxygenation should always be provided before and after each pass of the suction catheter into the artificial airway.

Secretions in peripheral airways are not directly removed by endotracheal suctioning.

The suction catheter should be no larger than half of the internal diameter of the endotracheal or tracheostomy tube.

INSTILLATION CONSIDERATIONS:

The use of instillation is only indicated for the stimulation of a cough reflex.

Instillation of a bolus of normal saline does **NOT** thin secretions due to the fact that sputum and saline are immiscible, therefore routine or regular instillation is contraindicated.

Instillation may result in decreases to arterial and mixed venous oxygenation, and may contribute to lower airway contamination secondary to the dislodgment of bacteria within the artificial airway or from contamination of saline during instillation.

Adequate systemic hydration and humidification of inhaled gases will assist in thinning secretions.

INDICATIONS FOR SUCTIONING:

- Visible secretions in the artificial airway
- Suspected aspiration of gastric or upper airway secretions
- Inability of patient to generate an effective cough
- Auscultation of adventitious lung sounds over the trachea and/or main stem bronchi
- Increase in peak airway pressures when mechanically ventilated
- Changes in monitored flow or pressure graphics
- Increase in respiratory rate or frequent coughing or both
- Gradual or sudden decrease in PaO_2 or SpO_2
- Sudden onset of respiratory distress
- To obtain a sputum specimen for diagnostic purposes

COMPLICATIONS:

- Respiratory arrest
- Cardiac dysrhythmias
- Cardiac arrest
- Hypertension or hypotension
- Increased intracranial pressure
- Bronchoconstriction/bronchospasm
- Pulmonary hemorrhage or bleeding
- Tissue trauma to the tracheal and/or bronchial mucosa
- Pulmonary atelectasis/alveolar derecruitment
- Hypoxemia/hypoxia
- Nosocomial infections
- Interruption of mechanical ventilation

EQUIPMENT:

- Manual resuscitator with PEEP valve and oxygen source
- Suction canister setup with regulator x2
- Sterile suction catheter kit – size 12/14/16 Fr
    - Suction catheter
    - Non-latex gloves
    - Pop-up cup
- Yankeur suction
- Sterile normal saline solution
- Pre-filled normal saline instillation vials
- 10 mL syringe
- Oral airway of appropriate size
- Sputum trap as required
- Stethoscope
- Personal protective equipment
- Ventilator swivel adaptor with flex tube

NOTE: For patients with a tracheostomy tube, ensure emergency tracheostomy equipment bag is readily accessible.

PROCEDURE:

1. Identify the patient and explain the procedure. Confirm the need for suctioning.

2. Wash hands and don personal protective equipment as appropriate.

3. Place the patient in semi-Fowler position as tolerated.

4. Ensure the manual resuscitator with PEEP valve is functional and attached to an oxygen source, with the PEEP set appropriately.

5. Turn on the suction source and set the regulator to 100 – 120 mmHg.

   NOTE: Maximum vacuum pressure for suctioning should not exceed 120 mmHg.

6. Select the appropriate size catheter and open the sterile suction catheter package on a clean surface, using the inside of the wrapping as a sterile field.

7. Open the pop-up cup on the sterile field taking care not to touch the inside of the container and fill with sterile normal saline.

8. Don sterile gloves.

9. Pick up the suction catheter, being careful not to touch non-sterile surfaces.

10. With the non-dominant hand, pick up the suction connecting tubing and secure the suction catheter to the connecting tubing.

11. Check the equipment for proper function by suctioning a small amount of sterile saline solution from the container.

12. Note the patient's cardiopulmonary status before, during, and after the suctioning period.

13. Hyperoxygenate the patient for at least 30 seconds by using one of the following methods:

    a. Pressing the 100% suction/oxygen button on the ventilator
    b. Attach the manual resuscitator with 100% oxygen to the artificial airway

14. Open the suction port of the ventilator swivel adaptor.

15. With NO suction applied, gently but quickly advance the suction catheter into the artificial airway until resistance is met, then pull back ~1 cm.

16. Occlude the thumb control port while withdrawing the catheter in a rotating manner until it is no longer within the artificial airway.

    NOTE: Suction time should not exceed 10 – 15 seconds.

17. Close the suction port of the ventilator swivel adaptor and hyperoxygenate the patient for a minimum of three breaths.

18. Additional passes of the suction catheter may be performed as per steps 14 - 17 if

secretions remain in the airway and the patient is tolerating the procedure.

NOTE: If it is deemed necessary to stimulate a cough, 5 – 10 mL of normal saline may be instilled directly down the artificial airway via the suction catheter port of the ventilator swivel adaptor using a pre-filled normal saline vial or a syringe containing sterile normal saline. Allow for 2 – 3 breaths post-instillation before advancing the catheter as per step 14.

19. Continue to hyperoxygenate the patient for one minute following the suction procedure. Observe the patient's vital signs and cardiac rhythm to ensure pre-suction limits have returned. Ensure the patient has been returned to their initial therapy and settings.

20. Coil the catheter in one hand and remove the glove in a manner that allows the used catheter to be contained within the glove. Discard.

21. Clear the upper airway using the yankeur suction as necessary.

22. Return the patient to their pre-procedure position. Assess for the effectiveness of the suctioning procedure.

23. Remove personal protective equipment and wash hands.

24. Document the procedure and patient response in the Respiratory Flowsheet or Progress Notes of the patient record. Include the colour, consistency, and amount of secretions removed from the airway, as well as an assessment of the patient's cough ability.