SUCTIONING

INTRODUCTION

- The aim of airway suction is to clear secretions, thereby maintaining a patent airway and improving ventilation and oxygenation.
- Removal of such secretions also minimizes the risk of atelectasis.
- However, it is not a benign procedure and adverse physiological effects directly attributed to airway suction are well documented. These effects can be both immediate and long-term, and therefore a sound knowledge of the procedure and its effects are a pre-requisite for undertaking the procedure, as is the availability of full resuscitation facilities

INDICATION

1. clear secretions, thereby maintaining a patent airway and improving ventilation and oxygenation when patient cannot clear secretions by houghing or coughing
2. Treatment of symptomatic hypercapnia.
3. Treatment of symptomatic Hypoxemia.
4. Airway protection against aspiration.

CONTRAINDICATION

Airway can be managed less invasively

Hemoptysis

EQUIPMENTS

1. Suction apparatus.
2. Gloves
3. Lubricating jelly
4. Suction catheter
5. Saline

Types of suctioning

- Nasopharngral
- Oropharyngeal
- Through Tracheostomy

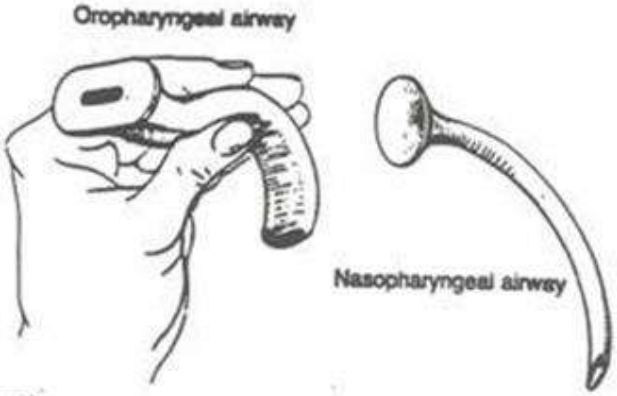

Figure 1

Portable Suction apparatus


1600
1500
1400
1300
1100
1000

ENDOTRACHEAL TUBE SIZE

AGE	PREEMIE	NEONATE	6 Mo.	1-2 yr.	4-6 yr.	8-12 yr.	ADULT
TUBE SIZE	2.5	3-3.5	3.5-4	4-5	5-5.5	6-7	7.5-8.5
BLADE SIZE	0	0-1	1	1-2	2	2-3	4-5

Endotracheal /Open Suctioning Procedure

- Preparation
  - Wash hands.
  - Determine the need for suctioning by breath sounds or palpation.
  - Let patient know are preparing to perform suction procedure, and see that head of bed is slightly elevated.
  - Gather equipment--suction catheter, sterile water, sterile glove, non-sterile glove (or pair of sterile gloves), face shield or goggles.
  - Test wall or portable suction equipment and adjust suction following recommendations

	Suction pressure
Adult	-100 to -120 mm Hg
Child	- 80 to -100 mm Hg
Infant	-60 to -80 mm Hg

PROCEDURE

- Open end of catheter package and connect catheter to suction tubing (leave catheter in its wrapper) and lay aside.
- Don goggles and gloves--sterile glove on dominant hand.
- Withdraw catheter from package and wrap around sterile gloved hand until ready to use. (Maintain asepsis! Hold dominant hand with sterile glove and catheter up high!).
- Connect hand resuscitator to ET or tracheostomy tube.
- Observe baseline vital signs (HR, rhythm, BP, ICP, SpO2).
- Hyperventilate/hyperoxygenate 2-3 deep breaths using ventilator **or** through hand resuscitator attached to wall oxygen supply (may trigger a cough).
- Stabilize the ET tube with the non-sterile gloved handbetween 4th and 5th fingers (a tracheostomy tube is less likely to move about).
- Without applying suction, insert catheter with the sterile hand through the tube to the carina (let patient know this will make him/her cough), and withdraw slightly.
- Apply intermittent suction -- no more than 20 seconds* -- as the catheter is slowly rotated and withdrawn. Wrap catheter around sterile hand and hold up out of the way.
- Re-hyperventilate/re-oxygenate ~1 minute, with non-sterile hand.
- Monitor HR, rhythm, BP, ICP, SpO2.

* Try blowing r air out and holding r breath for the duration.

Follow Up

1. Assess to determine if procedure needs to be repeated.
2. Repeat entire procedure if retained secretions make it necessary.
3. Clear large suction tube of secretions using saline solution or distilled water.

4. Discard gloves and catheter by wrapping around hand and pulling gloves over.
5. Discard face shield and wash hands.
6. Chart patient tolerance, approximate amount and color of sputum.

Endotracheal Closed System Suctioning Procedure

- Preparation
  - Wash hands.
  - Determine the need for suctioning by breath sounds or palpation.
  - Let patient know are preparing to perform suction procedure, and see that head of
  - bed is slightly elevated.
  - Gather equipment -- clean gloves, face shield (if needed), sterile normal saline (NS) for
  - instillation. Don't clean gloves.
  - Check equipment --adjust level of suction.

Procedure

1. Obtain baseline assessments.
2. Connect CSS device to suction tubing and unlock thumb port.
3. Hyperventilate/hyperoxygenate by increasing O2 concentration to 100% and implementing "sigh" on ventilator to give two or three deep breaths.
4. If patient has thick secretions instill 5-10 ml. sterile NS into the irrigation port during inspiration.
5. Stabilizing the ET tube, feed catheter through plastic sheet into the airway.
6. When catheter reaches carina (let patient know this will cause a cough), withdraw it slightly.
7. Apply intermittent or continuous suction (no more than 20 seconds) while slowly rotating and removing catheter from the airwayl.
8. RE-hyperventilate and hyperoxygenate about one minute.
9. Monitor HR, rhythm, BP, ICP, SpO2.

Follow Up

a. Assess to determine if need to repeat.
b. Repeat procedure if necessary.
c. Clear large suction tube of secretions using sterile water.
d. Lock suction control.
e. Discard gloves and face shield.

f. Wash hands.

g. Chart patient tolerance, approximate amount, and color of sputum.

Complication	Prevention	Management
Missing/broken teeth:	Remove loose teeth prior; avoid using upper teeth as fulcrum for laryngoscope blade.	Check chest x-ray to rule out aspiration
Clenched teeth:		Paralytic medication.

Contd...

Air leak:	Check cuff prior to beginning procedure.	Inject more air or change tube over guide wire.
Inability to visualize vocal cords:	Proper patient positioning, proper laryngoscope blade size, proper suctioning.	Reposition, choose a different blade, adequate suction, cricoid pressure by assistant.
Esophageal intubation:	Visualize cords.	Remove tube, re-oxygenate and reinsert.

PRECAUTIONS

1. Minimize suctioned-induced atelectasis and hypoxemia:

- Avoid using catheters larger than one-half the diameter of the airway.
- Administer one or more postsuctioning hyperinflations, using manual or sigh breaths on the ventilator or ambu bag if not ventilated.

2. Maintain rigorous sterile technique when suctioning the intubated patient.
3. 3. Limit the frequency of suctioning and avoid, as much as possible, catheter impaction in the bronchial tree when the patient is anticoagulated or when hemorrhage from suction-induced trauma is evident.
4. Minimize the frequency and duration of suctioning when patient is on positive end-expiratory pressure (PEEP) greater than 5 cm or continuous positive airway pressure (CPAP). Small suctioning-induced changes may have profound effects on these marginally oxygenated patients.
5. Maintain awareness of the limitations of ET/tracheal suctioning. Maneuvers and catheter design have been proposed to increase the likelihood of passage into the left bronchus; however, these have been shown to be of limited success. Because the left main stem bronchus emerges from the trachea at the 45-degree angle from the vertical, suction catheters are almost inevitable passed into the right bronchus (when they pass the carina) despite head-turning, etc.
6. The use of saline installations for loosening secretions has been controversial and recent research shows that in fact it is detrimental and poses a greater risk of pneumonia for the patient.

   RELATED CARE

   Include strategies to move secretions through peripheral airways. These measures are: appropriate hydration and adequate humidification of inspired gases (to keep secretions thin); coughing and deep breathing; frequent position changes (may need rotation bed); chest physiotherapy; and bronchodilating agents as ordered.
2. Monitor the patient carefully during ET/tracheal suctioning for ectopic dysrhythmias aggravated by suction-induced hypoxemia and other dysrhythmias, particularly conduction disturbances, related to catheter irritation of vagal receptors within the respiratory tract (requires immediate cessation of suctioning and hyperoxygenation).

Nasopharyngeal and nasotracheal suctioning helps remove secretions from the lower airway of patients who cannot cough and do not have an artificial airway in place.

To perform either type of suctioning, insert a small, sterile, flexible catheter into the nares until the tip reaches the pharynx or the trachea. Wear sterile gloves and use the catheter. Critically

ill patients who have an endotracheal or tracheostomy tube in place usually require suctioning of secretions via either the open or closed (in-line) method of suctioning. With both of these, it is important to insert the catheter without applying suction; applying suction on insertion could injure the airway. After inserting the catheter, apply suction while using a rotating motion to remove it.

To perform closed suctioning, wear clean (not sterile) gloves and use a multi-use catheter enclosed in a plastic sheath. The advantage of using a closed suction system is that it do not have to disconnect the patient from the mechanical ventilator. Thus, with this method, interruption to ventilation and oxygenation is not done to suction the patient's airway.