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Suction of the Patient with an Artificial Airway

Purpose To outline the procedure for suction of the patient with an artificial airway.

Audience All respiratory care practitioners

Scope

- Suction of the patient with an artificial airway is a procedure for the mobilization and removal of secretions. It is used to assist the patient with pulmonary hygiene when the airway severely limits the patient's own ability to remove lung secretions and to evaluate the patient's cough reflex mechanic in the lung clearing process.
- Suction to a patient's airway will be done using sterile techniques according to physician's orders.
- A closed catheter suction system will be used on all ventilated patients.

Accountability

This procedure may be administered by a Licensed Respiratory Care Practitioner with understanding of age specific requirements of patient population.

Physician's Order The physician's order must specify type of therapy and frequency. This procedure will automatically be performed as needed unless a physician order specifies a particular frequency.

Indications This procedure is indicated for any patient who is intubated or has a tracheostomy, whether or not they are receiving continuous mechanical ventilation.

Contra-indications Suction shall be postponed if the patient's well being is threatened by the procedure due to:

- Acute cardiac arrhythmia, which could be exacerbated by hypoxia or vagal stimulation.
- Acute hypotension that could be exacerbated by vagal stimulation.
- Severe hypoxia, which may be worsened by suctioning.
- Acute increase in intracranial pressure, which may be increased further due to cough.
- Undiagnosed pulmonary hemorrhage.
- Significant priority problems with other major systems, i.e., acute change in neurological status, chest pain, increased blood pressure, etc.
- Pulmonary edema requiring high peep, high fractional inspired oxygen concentration and continuous mechanical ventilation.

Note: The above should be considered relative to the possibility of retained secretions influencing the above situations.

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Goals

- To provide the intubated patient with sufficient assist to keep his lungs free of active infiltrate while causing the least possible impairment of cardiopulmonary function and damage to tracheal mucosa.
- To promote patency of the artificial airway.
- Decrease the incidence of atelectasis due to mucous plugging of airways.

Equipment

- A resuscitator bag (with oxygen supply) must be set-up with every patient who has an artificial airway.
- There must be appropriate adapters for the trach-tube/resuscitator bag omniflex.
- Sterile gloves.
- Sterile suction catheters. (Closed catheter if ventilated) of appropriate size for ET tube size. The catheter should not occlude more than ½ the diameter of tube when possible (not applicable in neonates).
- Wall or portable suction equipment with connecting tubing.
- 0.9% saline solution for lavage
- Sterile sputum trap if ordered.

Procedure

Step	Action
1	Check the patient's medical record for physician's order and change in patient's status. Identify patient using 2 identifiers.
2	Collect appropriate equipment. Wash hands.
3	Observe patient for clinical status, explain procedure and rationale to the patient and family, and position for best cough effort and lung clearance.
4	Ensure oxygen supply to resuscitator bag (~12-15 liters per minute) is on.
5	Count patient's pulse and respiratory rate. Auscultate the patient's chest.
6	If patient is coherent, ask patient for deep breath in and forceful exhalation and note chest expansion and muscles used.
7	Position the patient for saline instillation and best cough effort.

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Procedure Continued

Step	Action
8	If disconnecting patient from ventilator system alarms may be silenced, but not turned off or dialed out.
9	Instill saline into patient's airway tube as needed. Note quality of the reflexive cough mechanism stimulated by saline, note secretions raised.
10	Assist patient to recover breath with resuscitator and pre-oxygenation. The manual breath button may be used for this purpose on most ventilated patients.
11	Insert suction catheter without touching outside of tube and without applying suction. Pass catheter as quickly, gently, until resistance is met pull back 1/2 cm and apply intermittent suction (continuous suction if closed suction system) and begin to withdraw catheter. The catheter should not remain in the tube more than 20 seconds during the entire suction procedure. For pediatric patients, insert catheter to the point of resistance. For neonatal patients the catheter tip should not exceed the tip of the endotracheal tube.
12	Re-oxygenate the patient with resuscitator or ventilator and allow him/her to rest.
13	Repeat procedure as tolerated by patient. Use more saline if necessary for thick secretions.
14	Then return patient to appropriate oxygen delivery device.
15	Note changes in patient's vital signs, general appearance, and level of activity before, during, and after suctioning.
16	Suction pharynx gently via nose and/or mouth. Be aware of any contraindications to this procedure (i.e., CSF leak from fractured nasal sinus, fresh surgery in oral or pharyngeal area). Auscultate patient's chest.

Procedure

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Continued

Step	Action
17	Document therapy in Epic per RCS Policy # 7.1.1.

Undesirable Side Effects

Note: All effort should be made to induce safe effective reflex cough mechanic for lung clearing, to attempt to reduce amount of actual suctioning time and hazards associated with over or unnecessary suctioning.

- Hypoxia - particularly in significantly debilitated or compromised patient, may lead to tachycardia, arrhythmias and even cardiac arrest. For this reason, the patient must be oxygenated with resuscitator or 100% by ventilator before, during, and following the procedure.
- Dysrhythmias - Serious cardiac dysrhythmias may be caused by hypoxia or vagal stimulation.
- Increase in intracranial pressure - A prolonged cough maneuver is capable of causing significant increase in intracranial pressure and deleterious effects.
- Hypotension - This may occur due to bradycardia resulting from vagal stimulation or prolonged cough.
- Lung collapse - Occluding the tracheal tube with large catheter then suctioning can result in removal of sufficient air to cause collapse of respiratory units.
- Mucosal damage - The airway mucosa can be damaged by abrasion with the catheter and suctioning.
- Stump puncture - In patients with lobectomies and pneumonectomies it is possible to pass the catheter through the bronchial stump anastomosis. Use caution as to the length of catheter passed.
- Extubation - Extremely vigorous cough, patient determination or agitation, or unsecured tube may result in extubation. Extreme head turning side to side or hyperextension of neck may also result in extubation, particularly in infants and children.
- Contamination - An intubated patient is at high risk for contamination of his lower airway since his usual defenses have been bypassed. For this reason, sterile technique is absolutely necessary. Once a catheter

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Undesirable Side Effects Continued

- has entered the upper airway (nose, pharynx, mouth) it must not reenter the tube.
- Significant and overt bronchospasm from mechanical stimulation by suction catheter.

Assessment of Outcome

- This procedure will be considered effective if it meets the stated goals as evaluated by:
- Improvement in chest auscultation following stimulation/suction procedure.
 - Improvement in or maintenance of an acceptable chest x-ray.
 - Improvement in or maintenance of acceptable arterial blood gases.
 - Improvement in amount, color, and consistency of patient's secretions.
 - Improvement in the patient's voluntary and/or reflexive coughs, thereby decreasing amount of suction needed.

Patient Family Teaching

- Instruct the patient and / or family as follows:
- Explain to the patient why he/she is receiving cough stimulation/suction therapy. Relate it to his disease or injury state.
 - Explain the steps in the procedure and why they must be done.
 - Tell the patient that everything will be done to make the procedure as comfortable and as brief as possible to assist his/her cough and lung secretion clearance and help "give him his breath back". Use a Resuscitator bag with oxygen supply and appropriate tracheostomy tube adapters or supplemental device in a patient with an uncuffed tracheostomy tube.
 - If patient appears semi or unconscious, briefly tell what you are going to do, why, and then perform therapy.
- Document teaching in Patient/Family teaching record.

Infection Control

Follow procedures outlined in Healthcare Epidemiology Policies and Procedures #2.24; Respiratory Care Services.
<http://www.utmb.edu/policy/hcepidem/search/02-24.pdf>

References

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