Indwelling Suction Catheter

Purpose

To outline a process to provide clearance of secretions from lungs but retain **(PEEP)** by not opening ventilator circuit to atmosphere.

Audience

Physicians, Nursing Staff, licensed Respiratory Care Practitioners.

Accountability

Respiratory Care Services utilizes adjuncts necessary to maintain ventilatory parameters as ordered by the physician and required by the patient. All licensed Respiratory Care Practitioners assigned to acute areas may use this procedure with an understanding of the age specific requirements of the patient population.

Physician's Order

Order for suction and frequency.

Indications

- Patients who require PEEP to maintain PaO_2 in a range that is physiologically acceptable.
- Any patient that is on mechanical ventilatory support.

Contrain-dications

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, 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.

Goals

To provide effective airway clearance with maintenance of PEEP support.

Required Equipment and Supplies

- Closed Suction System.
- Suction source.
- Normal saline ampules

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Procedure

Step	Action
1	Attach catheter to ventilator circuit and endotracheal / trach tube. Insure irrigation port is closed.
2	Attach control valve to wall suction tubing.
3	Observe patient for clinical status; explain procedure and rationale to patient.
4	Take patient's pulse and respiratory rate (and blood pressure as necessary).
5	Auscultate patient's chest.
6	If indicated by auscultation, chest x-ray, or sputum characteristics, position patient for saline lavage (head of bed up) if blood pressure/range of motion permits.
7	Inform/ assure patient of impending procedure.
8	Pre- oxygenate patient.
9	Instill saline via pilot tube, located on the catheter adapter. Instill saline in synchrony with patient's inspiration phase.
10	Note quality of the reflexive cough mechanic stimulated by saline and secretions raised.
11	Insert catheter gently to point of resistance in adults / pediatric patients, in neonatal patients the catheter tip should not exceed the tip of the endotracheal tube.
12	Holding tee piece in one hand, slowly withdraw catheter. Apply suction by pressing button (control valve) while withdrawing catheter out of the endotracheal tube. Three to five seconds is usually adequate. While maintaining grip on the elbow adapter and control valve, gently withdraw suction catheter to fully extended length of catheter sleeve. Catheter should not remain in the tube more than fifteen (15) seconds during entire suction procedure. The catheter tip should not occlude the endotracheal tube post procedure.
13	Lift and turn thumb piece 180° to lock position on control valve.

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Procedure Continued

Step	Action
14	Immediately ventilate patient via manual control on ventilator.
15	Repeat procedure as patient tolerates, using more saline if necessary.
16	Affix the inline suction catheter to the main bore tubing of the ventilator circuit utilizing the accessory organizer clip so that the inline suction catheter is positioned distal to the patients endotracheal tube after completion of suction procedure.
17	Chart in Epic and RCS departmental treatment card appropriate information as per Respiratory Care Service Policies # 7.1.1and # 7.1.2.

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 AMBU or 100% per 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.

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Undesirable Side Effects Continued

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

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

Adult inline suction catheters will be changed weekly unless soiled or not functioning properly.

Corresponding Policies

RCS Policy and Procedure Manual, Suction of the Patient with an Artificial Airway, # 7.3.47.

References

AARC Clinical Practice Guidelines, Endotracheal Suctioning of Mechanically Ventilated Adults and Children with Artificial Airways; Respiratory Care, 1993; 38:500-504.

Scanlan CL, Simmons K; Airway Management. In: Scanlan CL, Wilkins RL, Stoller JK, Eds. Egan's Fundamentals of Respiratory Care, Eighth Edition, Mosby; June 2, 2003.

Blackwood B, Webb CH. Closed tracheal suctioning systems and infection control in the intensive care unit. Journal of Hospital Infections. 1998; 39:315-321.

Kollef MH, Prentice D, Shapiro SD, et al. Mechanical ventilation with or without daily changes of in-line suction catheters. American Journal Respiratory Critical Care Medicine. 1997; 156:466-472.

Grap MJ, Glass C, Corley M, Parks T. Endotracheal suctioning: ventilator vs manual delivery of hyperoxygenation breaths. American Journal Critical Care. 1996; 5:192-197.