1. PURPOSE

To ensure that Respiratory Care Practitioners and staff nurses are competent in performing sterile suctioning including endotracheal tube (ETT), tracheostomy tube (TT), naso-tracheal (NT) and oropharyngeal airways.

2. APPLICABILITY

All RCPs and staff nurses involved will be responsible for suctioning.

3. RESPONSIBILITIES

All intensive care units and wards.

4. POLICY

4.1 All patients with an ETT should have respiratory assessments every 4 hours, including assessment of air entry to determine if suctioning is required.

4.2 Assess every shift ETT position, cuff pressure, and ET tube stability prior to suctioning procedure to prevent ETT displacement/ and or aspiration of secretion.

4.3 In mechanically ventilated patients, ETT suctioning can be performed by a respiratory therapist and/or nurses.

4.4 Sterile saline or sterile water should only be used for flushing suction catheter and tubing. Opened water/saline bottle must be clearly dated, timed and discarded after 24 hours.

4.5 Normal saline instillation via ETT should not be performed unless indicated.

4.6 Suctioning must be performed using a sterile technique.

4.7 Suction should not be applied for more than 15 seconds, ventilation and oxygenation must not be interrupted for more than 20 seconds in an adults.

4.8 Single use suctioning catheter must be discarded immediately after use.

4.9 All patients will be pre-oxygenated and ventilated prior to suctioning.

4.10 The catheter must not occupy more than one half of the internal diameter of the tube being suctioned. Use this formula for Endotracheal & Tracheostomy suctioning: Size of the tube X 3 divided by 2.

4.11 When using closed suction system, the catheter must be withdrawn fully; i.e. the black line on the catheter must be visible in the plastic protective sheath, to prevent obstruction of the airway.

4.12 Physician's order must be obtained for sputum collection.

4.13 Patients receiving PEEP levels of 5 cmH_2O and above must have the same level of PEEP maintained between suctioning pauses.

4.14 Indication for use of close suction catheter on patients:

4.14.1 High ventilator requirements:

4.14.1.1 PEEP$\geq$ 10 cmH_2O
4.14.1.2 MAP$\geq$ 20 cm H_2O
4.14.1.3 Inspiratory time $\geq$ 1.5cm H_2O
4.14.1.4 Fraction of inspired oxygen $FiO_2 \geq 0.60$

4.14.2 Mechanically ventilated patients receiving frequent suctioning ($\geq$ 6 times/day).

4.14.3 Mechanically ventilated patients with respiratory infection requiring airborne.

4.14.4 Receiving inhaled agents that cannot be interrupted by ventilator disconnection (e.g., nitric oxide, helium/oxygen mixture).

4.14.5 On advance mode e.g.,: APRV, or HFOV

4.15 All patients with anti-coagulations must be suctioned with care to avoid bleeding and/ or trauma.

4.16 Use cold Saline on bleeding patients.

4.17 DO NOT perform nasopharyngeal suctioning if the patient has deviated septum, nasal polyps, nasal obstruction, nasal trauma, epistaxis, mucosal damage and fresh nasal surgery.

4.18 Maintain patient's oxygen saturation within acceptable range, or as ordered by the physician.

4.19 Avoid unnecessary suction on patients with head trauma.

4.20 Set suction pressure to -100 to -150 mmHg to prevent patient trauma.

5. PROCEDURES

5.1 Endotracheal (ETT) and tracheostomy (TT) Suctioning (Open System).

5.1.1 RCP or staff nurse can perform suctioning on ventilated patient :

5.1.1.1 Assemble equipment's.

5.1.1.2 Identify patient using 2 patient identifiers.

5.1.1.3 Wash hands and using appropriate PPE's as per Infection control approved policy

5.1.1.4 Administer analgesia as required, or per physician order

5.1.1.5 Assess patient's respiratory status and oxygen requirement.

5.1.1.6 Turn suction machine "On" and place finger over end of tubing attached to suction machine to ensure correct pressure is used.

5.1.1.7 Position patient in semi-Fowler's with head of bed elevated to 30° if condition permits.

5.1.1.8 Fill sterile gallipot with sterile saline/water.

5.1.1.9 Open sterile suction catheter and connect suction catheter to suction tubing using non-touch technique.

5.1.1.10 Do not deflate ETT cuff before suctioning to prevent aspiration.

5.1.1.11 Don sterile gloves on one hand. Pull to remove sterile suction catheter from its cover.

5.1.1.12 Insert suction catheter gently into ETT/TT tube without applying suction until resistance is felt or patient starts coughing. Do not use force.

5.1.1.13 Withdraw suction catheter 1 cm before applying suctioning. (Suction catheter position should only be 2 cm beyond the ETT/TT tip).

5.1.1.14 Gently rotate and apply continuous suction on withdrawal of suction catheter.

5.1.1.15 Do not suction ETT/TT for longer than 15 seconds at a time (prevent hypoxemia, injury to the mucosal layers).

5.1.1.16 Observe secretions in suction catheter for amount, colour and consistency.

5.1.1.17 Flush suction catheter with sterile saline/water.

5.1.1.18 Repeat suctioning if necessary allowing 30 - 60 sec between attempts. (Ensure patient's respiratory status returns to baseline before next attempt).

5.1.1.19 Use Yankauer catheter for oropharyngeal suctioning if required.

5.1.1.20 Disconnect and discard suction catheter and flush suction tubing.

5.1.1.21 Turn suction "Off".

5.1.1.22 Discard all used equipment and remove gloves.

5.1.1.23 Assess breath sounds, respiratory rate/pattern, secretions, cough effectiveness and presence of bleeding.

5.1.1.24 Document date and time, assessment findings, secretion (type and amount), any problems encountered.

5.1.1.25 Report any adverse effects to the physician.

5.1.2 RCP or staff nurse can help each other in performing this procedure.

5.1.2.1 Stabilize patient's head if needed. If adult patients need to be restrained, obtain physician's order first.

5.1.2.2 Disconnect patient from ventilator and pre-oxygenate patient with 100% oxygen for 3 – 5 breaths using an ambu bag.

5.1.2.3 For suctioning apply article 5.1.1 of this policy.

5.1.2.4 Reconnect Ambu bag and recommence manual ventilation and oxygenation long enough to keep oxygen saturation within acceptable range or as specified by the physician.

5.1.2.5 Monitor vital signs and SpO_2.

5.1.2.6 Reconnect patient to ventilator.

5.1.2.7 Ensure patient is comfortable.

5.1.2.8 Perform hand hygiene.

5.2 Endotracheal (ETT) and tracheostomy (TT) Suctioning (Closed System)

5.2.1 Closed suction catheter is placed by the respiratory therapist between the ETT or TT and ventilator to permit suctioning without interrupting oxygenation, ventilation or positive end expiratory pressure.

5.2.1.1 Calculate suction catheter size as above for open system.

5.2.1.2 Perform procedure step 1 to 8 as in article 5.1.1 of this policy.

5.2.1.3 Attach suction tubing to closed suction catheter port.

5.2.1.4 Turn on suction system by unlocking the suction control valve of the closed suction catheter.

5.2.1.5 Use your non-dominant hand to stabilize the ETT/TT and gently advance the catheter through the ETT/TT with your dominant hand.

5.2.1.6 Use your dominant hand to grasp the suction-control valve.

5.2.1.7 Withdraw suction catheter 1 cm and begin intermittent suctioning using slow rotating motion. Observe amount, colour and consistency of secretions.

5.2.1.8 Repeat suctioning as necessary allowing 30 – 60 sec between attempts. (Ensure patient's respiratory status returns to baseline before next attempt).

5.2.1.9 Remove suction catheter completely after suctioning to prevent airway obstruction or irritation.

5.2.1.10 Post-suctioning oxygenate patient to keep oxygen saturation within normal rage or as ordered by the physician, and repeat as needed.

5.2.1.11 Flush suction catheter by instilling sterile normal saline or water through the irrigation port as needed.

5.2.1.12 Lock the suction catheter by turning the suction control valve to the lock position or according the manufacturer's instructions.

5.2.1.13 Position suction catheter within the protective sleeve.

5.2.1.14 Discard used equipment and gloves.

5.2.1.15 Assess breath sounds, respiratory rate / pattern, secretions, cough effectiveness and presence of bleeding.

5.2.1.16 Ensure patient is clean and comfortable.

5.2.1.17 Perform hand hygiene.

5.2.1.18 Document procedure and patient's response in Cerner.

5.3 Nasopharyngeal Suctioning (Clean Procedure)

A second nurse or respiratory therapist maybe required to assist in restraining or immobilizing the patient's head for an uncooperative patient during the suctioning procedure to prevent trauma. For restrains physician order is required.

A *nasopharyngeal airway* is most often placed in a patient who requires frequent nasotracheal suctioning and to minimize damage to nasal mucosa that can be caused by suction catheter. Also, it helps to maintain the patency of the upper airway despite swelling.

5.3.1 Identify patient using 2 patient identifiers.

5.3.2 Assess and check history for nasal obstruction, polyps, mucosa swelling, and coagulation profile.

5.3.3 Gather equipment.

5.3.4 Perform hand hygiene and using appropriate PPE's as per Infection control approved policy

5.3.5 Auscultate the patient's lung fields and assess if suctioning is required.

5.3.6 Explain procedure to patient/family.

5.3.7 Ensure catheter size is not greater than half the diameter of the nostril.

5.3.8 A new suction catheter should be used for each nostril pass.

5.3.9 Turn suction machine "On" and place finger over end of tubing attached to suction machine to ensure correct pressure is used.

5.3.10 Position patient in semi-Fowler's with head of bed 30 degrees (if condition allows).

5.3.11 Monitor vital signs and SpO_2.

5.3.12 Pre-oxygenate patient as required prior to suctioning with facemask. (Use high flow oxygen as required).

5.3.13 Fill gallipot with sterile saline/water.

5.3.14 Open sterile suction catheter to connect to suctioning tubing.

5.3.15 Measure distance from tip of nose to earlobe without allowing suction catheter to touch patient's face. This measurement is an appropriate depth for advancing the suction catheter to reach nasopharynx.

5.3.16 Lubricate suction catheter with water soluble lubricant (e.g. KY gel).

5.3.17 Insert nasopharyngeal airway if necessary (need physician order).

5.3.18 Instruct patient to take several deep breaths.

5.3.19 Insert suction catheter into nostril and gently advance into nasopharynx without applying suction and without forcing.

5.3.20 If unable to easily pass suction catheter into nasopharynx, DO NOT FORCE. Remove catheter gently, reposition patient and re-attempt gentle insertion.

5.3.21 Apply intermittent suction for 10 – 15 seconds and withdraw suction catheter using gentle rotation.

5.3.22 Flush suction catheter using sterile saline/water.

5.3.23 Repeat suctioning if necessary alternating nostrils and allowing approximately 30 seconds – 1 minute between attempts. Ensure patient's oxygen saturations are stable before each further suctions attempt.

5.3.24 Assess breath sounds, respiratory rate/pattern, secretions, cough effectiveness and presence of bleeding.

5.3.25 Ensure patient is clean and comfortable.

5.3.26 Discard all used equipment and remove gloves.

5.3.27 Document date and time, assessment findings, secretion (type and amount) in cerner.

5.4 Oropharyngeal Suctioning (Clean Procedure)

5.4.1 Identify patient using 2 patient identifiers.

5.4.2 Assess and check history, and coagulation profile.

5.4.3 Gather equipment.

5.4.4 Perform hand hygiene and using appropriate PPE's as per Infection control approved policy

5.4.5 Auscultate the patient's lung fields and assess if suctioning is required.

5.4.6 Explain procedure to patient/family.

5.4.7 Monitor vital signs and SpO_2 and pre-oxygenate patient as required.

5.4.8 Put patient in semi-Fowler's position with head of bed 30 degrees (if condition allows). In conscious patient, turn head to the side. In unconscious patient place patient lateral with head towards the nurse for suctioning (to prevent accidental vomiting and aspiration.

5.4.9 Insert an oropharyngeal airway to prevent patient from biting catheter if necessary

5.4.10 Turn suction machine "On" and place finger over end of tubing attached to suction machine to ensure correct pressure is used.

5.4.11 Connect suction catheter or Yankauer to suction tubing.

5.4.12 Fill gallipot with sterile saline/water.

5.4.13 Insert suction catheter or Yankauer into the back of the mouth without applying pressure.

5.4.14 Apply intermittent suction for 10 – 15 seconds and withdraw suction catheter using gentle rotation. (To promotes cleaning of large area).

5.4.15 Flush suction catheter using a sterile gallipot filled with sterile saline/water.

5.4.16 Repeat suctioning if necessary using the same suction catheter or Yankauer and allowing approximately 30 seconds – 1 minute between attempts.

5.4.17 Assess breath sounds, respiratory rate/pattern, secretions, cough effectiveness and presence of bleeding.

5.4.18 Discard all used equipment's and gloves.

5.4.19 Perform hand hygiene.

5.4.20 Document date and time, assessment findings, secretions (type and amount), or any problems in Cerner.

5.5 INDICATION

5.5.1 Indication for Endotracheal (ET) and tracheostomy (TT) Tube Suctioning

5.5.1.1 Need to maintain patency of artificial airway

5.5.1.2 Need to remove accumulated pulmonary secretions as evidence by :

5.5.1.2.1 Saw tooth pattern on the flow-volume loop
5.5.1.2.2 The presence of coarse crackles
5.5.1.2.3 Increased peak inspiratory pressure
5.5.1.2.4 Deterioration of O_2 saturation or blood gas values
5.5.1.2.5 Visible secretions in the airway
5.5.1.2.6 Acute respiratory distress
5.5.1.2.7 Suspected aspiration of gastric or upper airway secretion.

5.5.1.3 Need to obtain a sputum specimen.

5.5.2 Indication for Nasopharyngeal and Oropharyngeal Suctioning

5.5.2.1 Need to maintain a patent airway and to clear secretions as evidenced by the following:

5.5.2.1.1 Visible secretions in airway

5.5.2.1.2 Breath sound diminished or coarse crackles
5.5.2.1.3 Feeling of secretion in the chest (increase tactile fremitus)
5.5.2.1.4 Clinically apparent increase Work of Breathing
5.5.2.1.5 CXR show atelectasis or consolidation
5.5.2.1.6 Restlessness
5.5.2.1.7 Deterioration of O_2 saturation or blood gas values

5.5.2.2 Stimulate cough

5.5.2.3 Need to obtain a sputum specimen

5.5.3 Relative Contraindication

5.5.3.1 ETT/TT suctioning is necessary procedure, there is no absolute contraindication
5.5.3.2 Occluded nasal passages
5.5.3.3 Nasal bleeding
5.5.3.4 Epiglottitis or croup
5.5.3.5 Acute head, facial, or neck injury
5.5.3.6 Coagulopathy or bleeding disorder
5.5.3.7 Laryngospasm
5.5.3.8 Irritable airway
5.5.3.9 Tracheal surgery
5.5.3.10 Myocardial infarction
5.5.3.11 Bronchospasm

5.5.4 Complication

5.5.4.1 Decrease in dynamic lung compliance and functional residual capacity.
5.5.4.2 Atelectasis, pneumothorax
5.5.4.3 Hypoxia or hypoxemia
5.5.4.4 Tissue trauma, edema, irritation or bleeding
5.5.4.5 Mucosal haemorrhage
5.5.4.6 Bronchospasm, laryngospasm
5.5.4.7 Gagging or vomiting
5.5.4.8 Discomfort and pain
5.5.4.9 Increase microbial colonization of lower airway
5.5.4.10 Increased intracranial pressure
5.5.4.11 Hyper/hypotension
5.5.4.12 Cardiac dysrhythmias, bradycardia, arrest

6. REFERENCES

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