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**EMS SKILL**

AIRWAY EMERGENCY / AIRWAY MANAGEMENT

**SUCTIONING - TRACHEOSTOMY TUBE AND STOMA**

**PERFORMANCE OBJECTIVES**

Demonstrate competency in suctioning a patient with a tracheostomy tube while maintaining aseptic technique.

**CONDITION**

Suction a simulated patient that who has a tracheostomy tube/stoma and has copious secretions and difficulty breathing. Necessary equipment will be adjacent to the manikin or brought to the field setting.

**EQUIPMENT**

Simulated adult or pediatric tracheostomy manikin, tracheostomy tube (metal/plastic) with an inner cannula, oxygen tank with connecting tubing, T-bar or tracheal mask, suction device with connecting tubing or hand-powered suction device with adaptor, sterile flexible suction catheter, sterile saline irrigation solution, sterile container, sterile saline irrigation vial/ampule and 5cc syringe with removable needle or saline squeeze ampule, pediatric resuscitation, sterile and unsterile gloves, goggles, masks, gown, waste receptacle, timing device.

**PERFORMANCE CRITERIA**

• Items designated by a diamond (⧫) must be performed successfully to demonstrate skill competency.

• Items identified by double asterisks (\*\*) indicate actions that are required if indicated.

• Items identified by (§) should be practiced.

• Ventilations must be at least at the minimum rate required.

• Must maintain aseptic technique.

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| **PREPARATION** | |
| **Skill Component** | **Key Concepts** |
| ⧫ Establish body substance isolation precautions | • Mandatory personal protective equipment – mask, gown, sterile gloves |
| ⧫ Assess the patient for the need to suction tracheal secretions | • Indications for suctioning: noisy breathing, coughing, copious secretions, respiratory distress, decreased oxygen saturation level, tachypnea, bradypnea, or patient request. |
| ⧫ Ensure the tracheostomy ties are secure | • If ties are not secure, the patient may cough out the tracheostomy tube when suction catheter is inserted or suction is applied. |
| ⧫ Ensure suction device is working | • Hand-powered suction devices may be used as long as they have an adaptor for a flexible catheter.  • Excessive negative pressures may cause significant hypoxia, damage to tracheal mucosa or lung collapse. |
| ⧫ Open suction kit or individual supplies | • Establish and maintain a sterile field. Use the inside of the wrapper of the suction kit or use a sterile towel to establish a sterile field.  • Catheter size should not exceed ½ the inner diameter of the airway. |
| ⧫ Open/unfold the sterile container and fill with irrigation solution | • Sterile saline is used to flush suction catheter as needed.  • Depending on kit, container may be under gloves and catheter; this should be removed without contaminating gloves and catheter. |
| ⧫ Sets the appropriate suction setting:  ***\*\*For the adult patient:*** ***80-120 mmHg***  ***\*\*For Peds and Elderly:*** ***Peds/Elderly 50-100mmHg*** |  |

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| **PROCEDURE** | |
| **Skill Component** | **Key Concepts** |
| ⧫ Measure the suction catheter  **\*\***Measures against the length of the inner cannula or spare tracheostomy tube | * Patients with tracheostomy tubes usually have spare tubes or inner cannulas in their home. |
| ⧫ Pre-oxygenate patient - *if indicated*:  • Increase oxygen liter flow to 15 Liters/minute for several breaths – if on oxygen  **OR**  • Ventilate with Bag-Mask-Ventilation (BMV) device 4-5 times | • Pre-oxygenation may be required in patients dependent on O2 source or if ventilator dependent to offset volume or oxygen loss during suctioning.  • Emergent suctioning does not allow time for pre-oxygenation. |
| ⧫ Remove oxygen source - *if applied* | • Patient may or may not be on oxygen and have either a T-bar or tracheal mask for humidification.  • Oxygen should be maintained until ready to suction. Flow rate may need to be adjusted to prepare patient for suctioning. |
| ⧫ Unlock and remove inner cannula - *if the device has an inner cannula* | • Not all trach tubes have inner cannulas.  • Sometimes just removing the inner cannula corrects the problem. The cannula may only need to be cleaned and replaced.  • The inner cannula does not need to be removed for routine suctioning. However, if the patient is in respiratory distress the inner cannula must be removed in order to avoid pushing thick secretions down the trachea.  • The 15mm adaptor that attaches to the BVM device on some trach tubes may be connected to the inner cannula. |
| ⧫ Don sterile gloves - *if indicated:*   * If the tracheostomy tube is new (inserted within 4-6 weeks).   **OR**   * The patient is immunocompromised | • Tracheal tube suctioning is generally a clean procedure. However, if the tracheostomy tube has just been inserted within 4-6 weeks, or the patient is immunocompromised. Sterile technique should be used.   * The following patients may be Immunocompromised:   + Cancer patients undergoing chemotherapy   + Patient’s being treated for rheumatoid arthritis   + Patients being treated for Crones disease      * Sterile gloves should be applied over existing clean gloves. |
| ⧫ Connect the sterile catheter to the suction tubing/device  \*\* ***Keep the dominant hand sterile – if wearing sterile gloves*** | • If sterile technique is required, the suction catheter should only be handled with sterile gloves.  • Keep the catheter in the sterile package until it is ready to be used.  • Catheter size should be smaller than the inner diameter of the trach tube to allow for ease of insertion and air to enter during suctioning. |
| ⧫ Suction a small amount of irrigation solution to lubricate the tip of the catheter | • Lubricating the tip of the catheter with irrigation solution prevents the catheter from adhering to the sides of the trach tube or tracheal mucosa. |
| ⧫ Insert the catheter into the tracheostomy tube/stoma **without** **applying suction** | • The patient is not being oxygenated at this time and applying suction may deplete oxygen reserves.  • If patient has a stoma, suctioning during insertion may damage the lining of the tracheal mucosa. |

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| **Skill Component** | **Key Concepts** |
| ⧫ Advance the catheter gently to appropriate level:  ***\*\*For a tracheostomy tube: Advances the suction catheter to the measured length of the suction catheter into the tracheostomy tube***  ***\*\*For a stoma: Advances the suction catheter approximately three (3) to four (4) inches into the stoma in the adult patient*** | • Ideally, the suction catheter should be measured against a tracheostomy tube. A tracheostomy tube length is app   * Shallow/measured suctioning may be all that is needed. Deep suctioning is usually not necessary unless cough is ineffective and airway is not cleared.   • Deep suctioning is at the level of the carina which is determined by the catheter meeting resistance during insertion.  • The patient may cough or develop bronchospasms when the tip of catheter touches the carina.  • Catheter insertion should be accomplished as rapidly as possible since the patient is not oxygenated during this step. |
| ⧫ Suction while withdrawing the catheter using a rotating motion and observe patient’s response:  ***\*\* Maximum suction time :***  • ***Adults - maximum 10 seconds***  • ***Children – no longer than 5-10 seconds***  • ***Infants - no longer than 3-5 seconds***  • ***Neonates – no longer than 3 seconds*** | • Rotating the catheter prevents the direct suctioning of the tracheal mucosa and suctions secretions from side of the tube.   * Roll the catheter between thumb and forefinger for rotating motion.   • Suctioning longer than recommended time may result in hypoxia and possibly bradycardia. Maximum suction time depends on patient’s age and tolerance.  • Patient’s response by coughing or grimacing may indicate the catheter is too deep and irritating the tracheal mucosa or carina. May also increase intracranial pressure, tachycardia, and hypertension. |
| ⧫ Replace the oxygen source  ***\*\*Deliver positive pressure ventilations - if indicated*** | • Patients may need supplemental oxygen after suctioning.  • If the patient is ventilator dependent, ventilate the patient with a bag-mask device in between suction attempts. |
| ⧫ Evaluate airway patency and heart rate –  ***\*\*Repeat the procedure if needed*** | • Observe patient for hypoxemia, dysrhythmias, cyanosis, anxiety, bronchospasms, and changes in mental status.  • If vagal stimulation occurs, the patient may experience bradycardia, especially pediatric and elderly patients.  • Allow patient to rest and regain adequate oxygen levels between suctioning attempts. |
| ⧫ Suction the remaining irrigation solution into a ~~collection~~ canister and discard appropriately | • Remaining irrigation solution is contaminated and should be treated the same as secretions. |
| ⧫ Discard the contaminated catheter  • Coil the contaminated catheter around a gloved hand and pull the glove over the catheter  • Pull glove from other hand over packaged catheter and discard in approved waste receptacle | * Avoid coming skin contact with the contaminated catheter. If this occurs, wash the area immediately with soap and water. |
| ⧫ Don a clean set of gloves |  |
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| **REPLACE INNER CANNULA** | |
| **Skill Component** | **Key Concepts** |
| ⧫ Check for a clean spare inner cannula spare  \*\*If there is **NOT** a clean spare inner cannula, rinse the inner cannula with sterile water or normal saline- *if needed* | • Most patients have a spare inner cannula at their bedside.  • If the inner cannula needs to be cleaned, this can be done by the rescuer, caregiver, or partner.  • Procedure for cleaning the inner cannula:  - rinse the inner cannula with saline  - suction or use a pipe cleaner to remove secretions  - gently tap the cannula to remove excess solution before reinsertion |
| ⧫ Remove the oxygen source – *if applied* |  |
| ⧫ Replace and lock clean inner cannula in place |  |

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| **RE-ASSESSMENT**  **(Ongoing Assessment)** | | |
| **Skill Component** | | **Key Concepts** |
| § Re-assess the patient least every 5-15 minutes for:  • Changes in airway sounds or gurgling   * Changes in respiratory status   • Vital signs: Blood pressure, pulse, and respirations  ***\*\*Manage patient’s condition as indicated.*** | | * Evaluating and comparing the results from a prior assessment assists in recognizing if the patient is improving, deteriorating, or responding to treatment. |
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| **PATIENT REPORT AND DOCUMENTATION** | | |
| **Skill Component** | **Key Concepts** | |
| § Verbalize/Document  • Indication for suctioning  • Oxygen liter flow – *if applied*  • Patient’s tolerance of procedure  • Any problems encountered  • Secretions:  - color  - consistency  - quantity  - odor  • Respiratory assessment and heart rate:  - respiratory rate  - effort/quality  - tidal volume  - lung sounds | • Documentation must be on either the Los Angeles County EMS Report form, departmental Patient Care Record form, or ePCR.  • Documenting reassessment information provides a comprehensive picture of patient’s response to treatment. | |

Developed: 10/02 Revised: 11/2018



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**Supplemental Information**

**DEFINITIONS:**

• Inner cannula – A tube that fits inside the tracheostomy tube. It may be removed for cleaning

• Pre-oxygenation - increasing oxygen liter flow for a brief period or ventilating the patient 3-4 times with a bag-valve device to increase the blood oxygen level

• Tracheotomy - a surgical incision into the trachea to establish an airway that may be temporary or permanent

• Tracheostomy - a tracheal stoma (opening) that results from a tracheotomy

• Tracheostomy tube - a plastic or metal tube inserted below the 2nd or 3rd tracheal ring bypassing the epiglottis

**INDICATIONS:** To maintain a patent airway in patients with a tracheostomy tube or stoma.

• Gurgling mucus sound from tracheostomy (noisy respirations)

• Bubbles of mucus in trach

• Coughing up secretions

• Patient requests to be suctioned

• Respiratory distress due to airway obstruction.

**COMPLICATIONS:**

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| • Hypoxia  • Bronchospasms  • Tracheal trauma  • Infection/sepsis | • Cardiac irritation (dysrhythmias) due to decreased myocardial oxygenation  • Tachycardia, hypertension, intracranial pressure due to coughing and gagging  • Bradycardia and hypotension due to vagal stimulation  • Cardiac arrest |

**NOTES:**

• Pre-oxygenation may be required depending on patient’s condition. This offsets volume and oxygen loss during suctioning.

• Patient may or may not be on oxygen and have either a T-bar or tracheal mask for humidification.

• Oxygen should be maintained until ready to suction – if it has been applied.

**Inner Cannulas:**

• Sometimes just removing the inner cannula corrects the problem. The cannula may only need to be cleaned and replaced.

• The inner cannula does not need to be removed for routine suctioning. However, if the patient is in respiratory distress the inner cannula must be removed in order not to push the thick secretions back down the trachea and to open the airway immediately.