

EL DORADO COUNTY EMS AGENCY

FIELD PROCEDURES

Effective: July 2008

Reviewed: July 2021

Revised: May 2022

Scope: ALS –Adult and Pediatric

EMS Agency Medical Director

NEEDLE CRICOHYROIDOTOMY

PURPOSE:

To provide an emergency airway to the patient who is in respiratory or cardiac arrest or has a complete airway obstruction and all other methods of BLS and ALS ventilation have failed.

INDICATIONS:

The adult or pediatric patient who is in respiratory or cardiac arrest or has a complete airway obstruction where conventional methods to establish ventilation have been unsuccessful. This includes abdominal thrusts, Heimlich procedure, back blows, orotracheal visualization and McGill forceps for foreign body removal, orotracheal intubation, supraglottic airway device, bag valve mask ventilation, and standard methods for correction of airway obstructions.

This is a last resort procedure for patients who will otherwise succumb to their obstructed airway.

CONTRAINDICATIONS:

- When other BLS or ALS adjuncts can successfully ventilate the patient
- When landmarks cannot be clearly identified – often difficult in pediatric patients less than 14.
- Transection of the trachea
- Relative contraindications may exist such as known tracheal disease, cancer, or lower airway obstruction. However, this is a procedure of last resort thus consider the benefit vs. the risk

COMPLICATIONS:

- Subcutaneous emphysema
- Tracheal mucosal injury
- Mediastinal emphysema
- Bending of catheter
- Hemorrhage
- Pneumocyst
- Esophageal or mediastinal puncture
- Aspiration
- Barotrauma
- Thyroid perforation

EQUIPMENT:

- 10-14 gauge reinforced style catheter (minimum of 2 ½ “ long)
- 5 mL syringe
- Chlorhexidine Prep/Swabs
- Normal saline
- Twill tape
- Tape
- Oxygen flow modulator
- Oxygen source (15-30 liters per minute flow capacity)

NEEDLE CRICOHYOIDOTOMY

CONTINUED

PROCEDURE:

- 1) Attach oxygen flow modulator to oxygen source.
- 2) Place the patient in a recumbent or semi-recumbent position with neck slightly extended. (No extension if patient has suspected spinal injury)
- 3) Identify cricothyroid membrane.
- 4) Prep the patient's neck with chlorahexidine swab/prep.
- 5) Stabilize the larynx with the thumb and middle finger and place the index finger over the cricothyroid membrane.
- 6) Attach the transtracheal airway catheter to a 5 mL syringe filled with 2 mL of normal saline. Insert the catheter at a 45-degree angle directed inferiorly through the cricothyroid membrane.
- 7) Cannulate the trachea through the cricothyroid membrane and advance the transtracheal airway catheter until aspiration of air can be obtained in the syringe.
- 8) Remove the needle firmly holding the catheter in place.
- 9) Secure the catheter in place with twill tape, reinforced with adhesive tape.
- 10) Attach the Luer lock of the oxygen flow modulator to the transtracheal airway catheter.
- 11) Select an oxygen flow of at least 15 up to 30 liters per minute.
- 12) Cover all vent holes of oxygen flow modulator using thumb and forefinger for two (2) seconds and release all vent holes for three (3) seconds. Continue oxygenation cycle as above.
- 13) Auscultate the patient's chest and the upper abdomen for breath sounds to confirm pulmonary inflation and exhalation. Note: ETCO₂ device cannot be used with flow modulator.

Never attempt needle cricothyroidotomy in a moving vehicle.

The pulsed oxygen flow should result in slight inward and outward movement of the chest and or upper abdomen. In case of complete upper airway obstruction, quantitative gas discharge from the patient's lungs through the released openings of the oxygen flow modulator will need more time.

Needle cricothyroidotomy only accomplishes oxygenation and does not replace ventilation. Therefore CO₂ retention will quickly be a problem. Ideally a definitive airway such as surgical cricothyroidotomy or tracheostomy should be performed within 20 minutes by an emergency physician or qualified flight nurse or flight paramedic.

Documentation should include indications, procedures followed, time and location, equipment used, response/success of procedure, reassessment of patient and device placement at turn over of care.

Act decisively when moving to needle cricothyroidotomy, while the patient is still alive giving the best opportunity for a successful outcome.