Emergency Cricothyrotomy – 30.060

INDICATIONS:

A. Unable to intubate, ventilate or oxygenate patient.
B. Unable place a supraglottic/extraglottic airway.
C. Oral, facial, or oropharyngeal injuries that preclude oral tracheal or nasotracheal Intubation.
D. Laryngeal fracture with severe respiratory distress or compromise.
E. Suspected airway occlusion from thermal or caustic injury, angioneurotic edema, asthma, edema, anaphylaxis, epiglottitis, severe croup, or foreign body obstruction.

CONTRAINDICATIONS:

A. Expanding anterior neck hematoma.
B. Inability to define anatomical landmarks.
C. Transected trachea with retraction of trachea into mediastinum.

PROCEDURES:

A. Surgical Cricothyrotomy: *Primary Adult Method* (Pt over 40 kg or 8 years old)
    1. Equipment:
        (A) Surgical Cricothyrotomy kit (Scalpel, Dilator, Tracheal hook, Cuffed Catheter w/blunt stylet, Syringe, and Securing tape)
        (B) Bougie
        (C) BVM with oxygen source
    2. Procedure:
        (A) Consider sedation with **Midazolam** as with RSI.
        (B) Place the patient in a supine position.
        (C) Assure stable positioning and hyperextend the neck. *If suspected cervical spine injury* maintain the head and neck in an in-line neutral position.
        (D) Secure the trachea by placing the thumb on one side and middle, ring, and pinky fingers on the opposite side. Using index finger palpate the thyroid notch, cricothyroid interval and the sternal notch.
        (E) Make a 2 - 3 cm *vertical* incision over the area of the cricothyroid membrane. A *horizontal* stab incision is then made through the cricothyroid membrane. Air movement through the incision may be noted when entering the trachea.
        (F) Insert the tracheal hook into the incision and pull gentle traction towards the patient's head to establish incision opening. If a second person is available, they can hold the hook to maintain the opening.
        (G) Insert the dilator at a perpendicular position into the trachea and enlarge the opening vertically.
        (H) Begin to place the cuffed catheter w/ blunt stylet between the blades of the dilator. If possible, rotate the dilator 90 degrees towards the patient's feet to facilitate passing the catheter. Once completely inserted, remove the dilator and stylet, use syringe to inflate the cuff with 6 -10 ml of air, and remove the hook. Always attempt to place the catheter so the tip follows the trachea towards the feet.
        (I) If resistance is met while attempting to place the catheter do not force it, it could result in pushing the stylet through the back of the trachea. Remove the catheter and place a Bougie into the incision in the same manner as the catheter. Once the Bougie is in the trachea via the incision, thread the

catheter tube over it until fully inserted. Remove dilator and Bougie, use syringe to inflate the cuff with 6 -10 ml of air, and remove the hook.

(J) Evaluate ventilation and secure the tube.

A. Quicktrach: *Secondary Adult Method* (Pt over 75 kg or 12 years old)

1. Equipment:
   - (A) Quicktrach 4.0 mm kit
   - (B) BVM with oxygen source
2. Procedure:
   - (A) Consider sedation with **Midazolam** as with RSI.
   - (B) Place the patient in a supine position.
   - (C) Assure stable positioning and hyperextend the neck. *If suspected cervical spine injury* maintain the head and neck in an in-line neutral position.
   - (D) Locate the cricothyroid membrane (in the midline between the thyroid cartilage and the cricoid cartilage).
   - (E) Secure the larynx laterally between the thumb and middle finger and reconfirm the location of the cricothyroid membrane.
   - (F) Firmly hold the device and puncture the cricothyroid membrane at a *90 degree angle*.
   - (G) After puncturing the cricothyroid membrane, check entry of the needle into the trachea by aspirating air through the syringe. If air is aspirated the needle is in the trachea.
   - (H) Change the angle of the needle to *60 degrees* and advance the device forward into the trachea to the level of the stopper.
   - (I) Remove the stopper being careful not to advance the device further into the trachea with the needle still attached.
   - (J) Hold the needle and syringe firmly and slide only the plastic cannula along the needle into the trachea until the flange rests on the neck. Carefully remove the needle and syringe.
   - (K) Secure the device to the neck.
   - (L) Apply the connecting tube to the device and ventilate.

PEDIATRIC NEEDLE CRICOTHYROTOMY:

PROCEDURE:

Needle Cricothyrotomy:

1. Equipment:
   - (A) 14 ga or 16 ga angiocath
   - (B) 3 ml syringe
   - (C) 2.5 mm ETT adapter
   - (D) BVM device with oxygen source
   - (E) Securing device or tape
2. Procedure:
   - (A) Consider sedation with **Midazolam** as with RSI.
   - (B) Place the patient in a supine position with support under the shoulders and mild hyperextension of the neck unless C-Spine injury is suspected.
   - (C) Palpate the neck in the midline and locate the slight depression just below the notch of the thyroid cartilage. This is the position of the cricothyroid membrane.
   - (D) Prepare the area with antiseptic solution.
   - (E) Stabilize the airway between thumb and forefingers.

(F) Insert the needle with catheter into the cricothyroid membrane at a *45 - 60 degree angle* caudally (toward the Pt's feet).
(G) When the needle is through the membrane. Stop and aspirate for air to ensure tracheal entry.
(H) Advance the catheter over the needle and then remove the needle.
(I) Attach the 2.5 ETT adapter to the hub of the catheter and begin ventilations with the BVM.
(J) Secure the cannula with tape after confirming correct placement by auscultation for breath sounds (5 point check). Observe for kinking of cannula.

NOTES & PRECAUTIONS:

A. Hazards in performing this procedure are primarily related to damage of nearby structures such as: major vessels to either side of the midline, to the vocal cords if the puncture is made too high, or a through and through injury of the trachea if the puncture is made too deeply. The latter is more commonly seen in infants and children whose tracheas may be deceptively narrow.
B. Palpation of the cricothyroid membrane is very difficult in the infant and young child. The key to success is immobilization of the trachea throughout the procedure.
C. Needle cricothyrotomy is only a temporizing measure providing oxygenation not adequate ventilation.
D. QuickTrach - If aspiration of air is not possible because of an extremely thick neck, you may remove the stopper and carefully insert needle farther until entrance into the trachea is made.
E. Needle Cricothyrotomy- If catheter becomes occluded, flush with 2 - 3 ml of normal saline.
F. Possible complications from artificial airway placement
    1. Hypoxia
    2. Right mainstem intubation
    3. Asphyxia
    4. Cellulitis
    5. Esophageal hematoma
    6. Exsanguination hematoma
G. Possible complications from cricothyrotomy
    1. Hematoma
    2. Posterior tracheal wall perforation
    3. Subcutaneous and/or mediastinal emphysema
    4. Thyroid perforation
    5. Inadequate ventilation leading to hypoxia and death
    6. Pneumo-peritoneum