

# Needle Cricothyrotomy

## Introduction:

Needle cricothyrotomy is an acceptable alternative to surgical cricothyroidotomy and the preferred technique in children. However, it can only provide adequate ventilation for only 30-45 minutes.

## Indications:

- Need for emergency airway control
- Failure of or contraindication to nasotracheal / orotracheal intubation
- Patient age less than 8 years
- Upper airway obstruction secondary to edema, hemorrhage, or foreign body

## Contraindications:

- No absolute contraindication
- **Relative contraindications:**
  - Coagulopathy
  - Anterior neck hematoma
  - Overlying infection
  - Fractured larynx
  - Possible tracheal transection
  - Complete upper airway obstruction

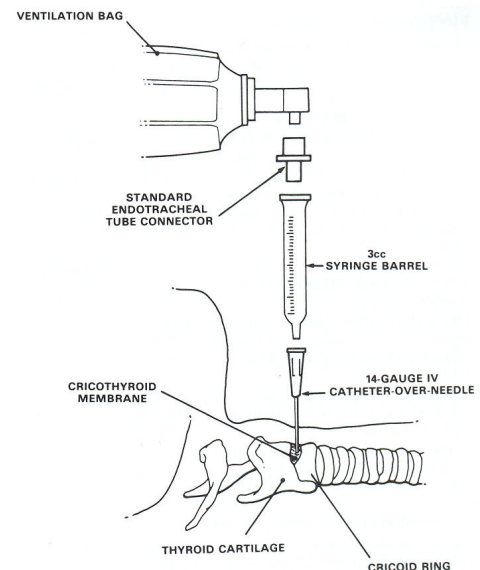
## Equipment:

- Towel roll
- Betadine antiseptic solution
- 4 × 4 gauze
- 14-or16-gauge angiocatheter
- 3-or 5-ml syringe
- Normal saline
- 2-0 silk suture material
- Hemostat
- 30-50 PSI oxygen source and tubing

*PSI: Pound per Square Inch*

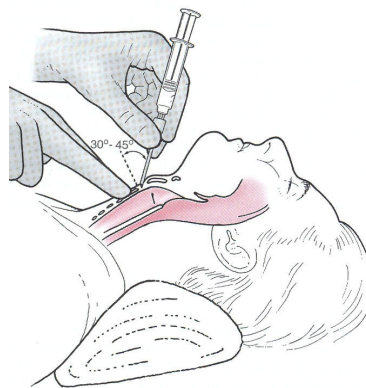
## Technique:

1. Position the patient in supine, with neck in neutral position. In trauma patients a cervical spine injury must be assumed and hard collar should be used until radiological and clinical examination have excluded this diagnosis.
2. If it is not contraindicated, place a towel roll under the patient's shoulders and lower neck to maximize exposure of the neck.
3. Identify the cricothyroid membrane. Begin palpation in the sternal notch and work cephalad in the midline. The cricothyroid membrane is the depression in

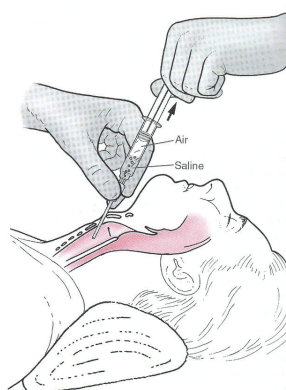


the airway just cephalad to the cricoid cartilage. The thyroid cartilage is just cephalad to this membrane and is the only V-shaped cartilage in the neck.

4. Attach the angiocatheter to the syringe. Aspirate 1 to 2 ml of normal saline into the barrel of the syringe.
5. Prepare the anterior midline neck in sterile fashion. Locate the cricothyroid membrane again. Stabilize the thyroid cartilage with the thumb and middle fingers of the nondominant hand. Place the index finger of the nondominant hand on the cricothyroid membrane.
6. The catheter over the needle is inserted 30°- 45° to the perpendicular (dotted line) and aimed inferiorly.

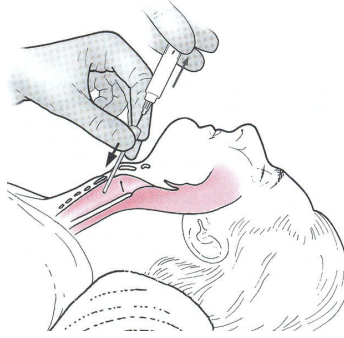


7. Advance the angiocatheter through the skin and cricothyroid membrane into the larynx while maintaining negative pressure on the syringe. The appearance of bubbles in the barrel of the syringe should confirm proper location.



8. Once into the larynx, advance the catheter over the needle in a caudad direction. Remove the needle and syringe, being careful to stabilize the catheter

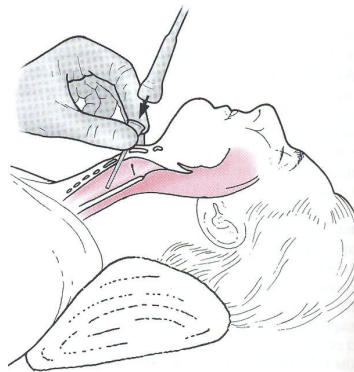
in place.



9. Suture the catheter in place. Attach the catheter directly to the wall oxygen supply or jet ventilation source.

### **Complications:**

- Improper placement
- Subcutaneous emphysema
- Inadequate ventilation
- Hemorrhage
- Aspiration
- Infection
- Barotrauma



### **Discussion:**

- The placement of normal saline into the barrel of the syringe is helpful for confirmation of proper location but is not essential to the procedure.
- In young patient the bony landmarks may be difficult to palpate because the thyroid cartilage does not become prominent until adolescence. For this reason the cricoid cartilage is the key landmark.
- Many commercially available kits for needle cricothyrotomy include essentially the same components as above with slight modifications.
- Needle cricothyrotomy is a temporizing measure. Preparations should be made for either fiberoptic intubation or formal tracheostomy.
- Needle cricothyrotomy is also a component of retrograde intubation. In addition, its equipment is incorporated into some of the adult cricothyrotomy kits rather than an open technique.
- The procedure can be done by prehospital personnel with advanced training and scope of practice.

## Checklist for Needle Cricothyrotomy

1. Assembles correct equipment in the tray
2. Washes hands
3. Uses mask, gown and gloves
4. Places a towel roll under the patient's shoulder and lower neck, if it is not contraindicate
5. Identifies the cricothyroid membrane
6. Attaches the angiocatheter to the syringe, and aspirate 1 to 2 ml of normal saline
7. Cleans site of procedure with antiseptic solution
8. Inserts angiocatheter in cricoid space and advances into the larynx
9. Removes needle and syringe and stabilizes the catheter in place
10. Sutures the catheter in place
11. Attaches the catheter to the wall oxygen supply
12. Discards gloves
13. Records finding on patient's medical record