Cricothyrotomy
Sugarloaf 2015 Airway Bootcamp

I. Introduction

A. Indications

1. Failed airway – **can't intubate, can't oxygenate and can't ventilate** (consider Extraglottic Devices – LMA, Combitube, King LT)
2. Primary airway if intubation contraindicated/impossible – e.g. facial trauma
3. In the 2005 National Emerg Airway Registry (NEAR), 7,000 intubations, US and Canadian EM residencies, rescue cricothyrotomy only **performed 0.7% of time – it is rare, but need to practice!**

B. Assessment

1. **SMART** pneumonic (used to be SHORT) review (Surgery, Mass, Access/Anatomy, Tumor) to help predict difficult surgical airway
2. Will incision at level of cricothyroid bypass obstruction?

C. Contraindications

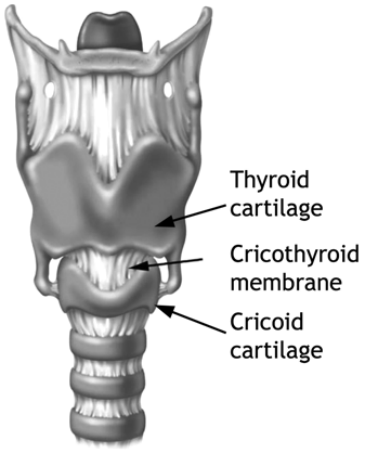
1. No true contraindication > 12 yo – may be last resort
2. Young age
    a. Debate as to age
    b. Ron Walls' airway book quotes < 12 yo as small, pliable, mobile larynx and cricoids cartilage makes it extremely difficult; also disproportionately smaller
3. Relative contraindication: laryngeal/tracheal pathology, tumor, infection, abscess, hematoma

D. Equipment

1. Commercial Cric kits
2. Contents of open Cric kit
    a. Trousseau Dilator
    b. Tracheal Hook
    c. Scalpel with #11 blade
    d. Cuffed, nonfenestrated, # 4 tracheostomy tube or #6 cuffed ETT
    e. Optional equipment (several 4x4 gauze sponges, 2 small hemostats, surgical drapes, *bougie* to cannulate and confirm placement)

E. Anatomy and Landmark Identification

1. Thyroid cartilage and cricoid cartilage – cricothyroid membrane
2. Laryngeal prominence -- approx one fingerbreadth below is membrane
3. Four fingers above sternal notch
4. Beware thyro-hyoid space and hyoid bone



II. Techniques

A. The "No – drop technique"

1. Identify Landmarks
2. *Stand on right side*
3. Prepare neck (antiseptic, optional lidocaine, trans MB lido)
4. **Immobilize larynx** with non-dominant hand throughout procedure, thumb and long finger
5. **Incise vertically through skin, 2cm**
6. Re-identify the membrane with finger and hold until replaced with hook
7. **Incise the inferior aspect of membrane in horizontal orientation , 1cm** (superior cricothyroid artery)
8. **Insert tracheal hook** on inferior thyroid cartilage, and **pull cephalad** (keep in place until tracheostomy placed)
9. **Insert trousseau dilator** (sideways) and dilate membrane vertically
10. **Insert tracheostomy tube** (sideways) and insert as rotating dilator caudad
11. Remove dilator, remove hook, blow of cuff, secure

B. Rapid 4-step technique – *Faster, but only do if landmarks clearly identified*

1. Palpate and identify landmarks
2. *Stand on patient's left side*
3. Prepare neck
4. Used a #20 blade, **Incise skin and cricothyroid membrane simultaneously,** horizontal incision approximately 1.5 cm in length
5. **Keep blade in place and insert hook below** it (at no point is incision left without instrument control of the airway)
6. **Apply traction**
    1. Tracheal hook rotated **caudally and controls cricoid ring**
    2. Tracheal hook lifts airway toward skin incision
    3. This traction generally provides sufficient widening of incision and obviates need for Trousseau dilator
7. **Intubate**
8. Can use **bougie** to facilitate intubation

C. Melker/Cook Kit for Percutaneous Cricothyrotomy

1. Identify landmarks
2. Stand at head of bed
3. Prepare neck
4. Introduce 18-gauge locator needle with syringe, caudad direction, 45deg, negative pressure, aspirate air
5. Insert guide wire
6. Skin nick
7. Insert airway and dilator
8. Remove wire and dilator