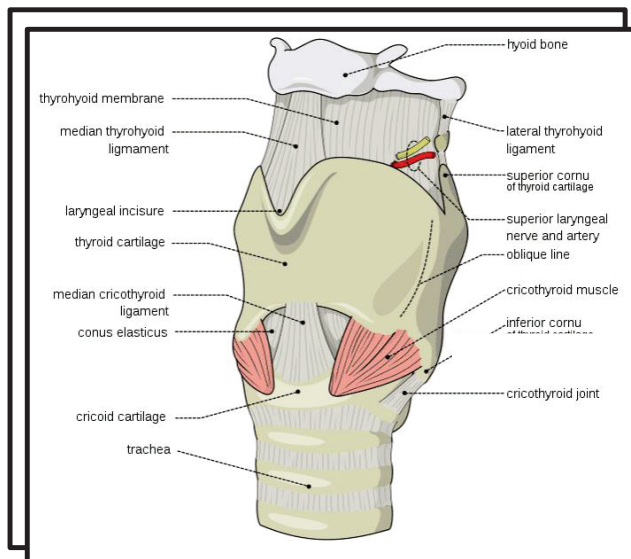


# CRICOTHYROTOMY

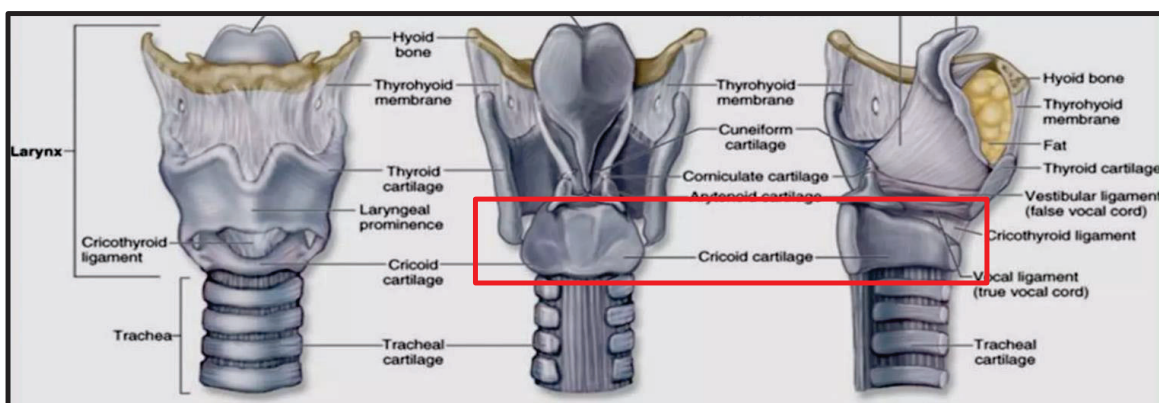
*made incredibly easy*

Randy Sorge, MD, FACEP  
Louisiana State University  
EMerald Coast Conference 2023

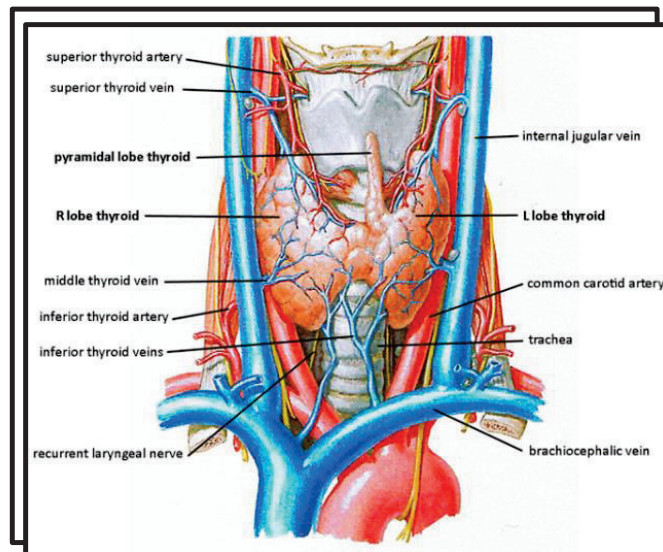
## ANATOMY



## ANATOMY



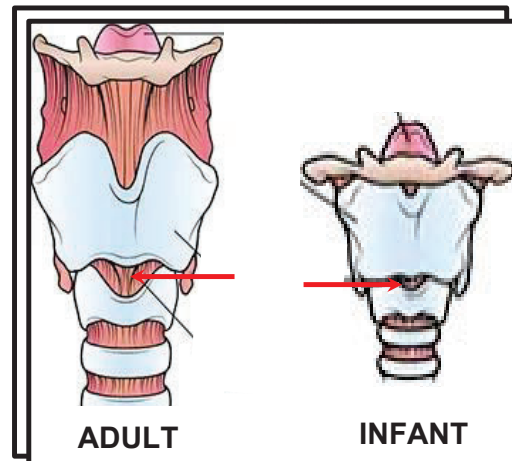
# ANATOMY



## INDICATION FOR AN EMERGENT CRICOTHYROTOMY:

## CONTRAINDICATIONS

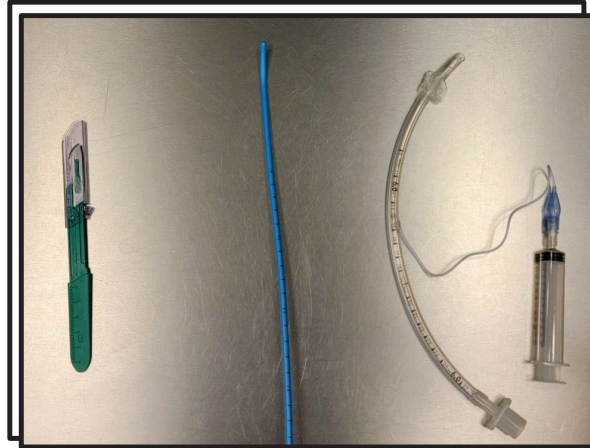
- Known laryngotracheal disruption e.g. surgery, mass, radiation, trauma
- **Age < 8-12 years**
  - the CTM has not yet developed adequately to allow for access
  - adipose obscure landmarks
  - hyoid bone is more prominent than thyroid cartilage
  - thyroid notch is not palpable
  - CTM is nearly transverse and “slit-like”
  - even at 8 yrs the membrane is half the height & width of an adult’s



Sapienza, C et al. Laryngeal Structure and Function in the Pediatric Larynx. Language, Speech, and Hearing Services in Schools. 2004

# ESSENTIAL EQUIPMENT

- Gloves
  - \* Eye protection
- 
- Scalpel #10
  - Bougie
  - 6.0 cuffed ETT
  - 10ml syringe



## IDEAL POSITIONING

- Stand on the same side of the bed as your dominant hand
  - If you are R handed, stand on the patient's R side
- Extend the neck with a towel
  - This stretches the CTM and widens the space
- Remove c-collar, airway takes priority
- Identify landmarks
- Pretreat with sedative
  - Ketamine will dissociate without suppressing resp drive

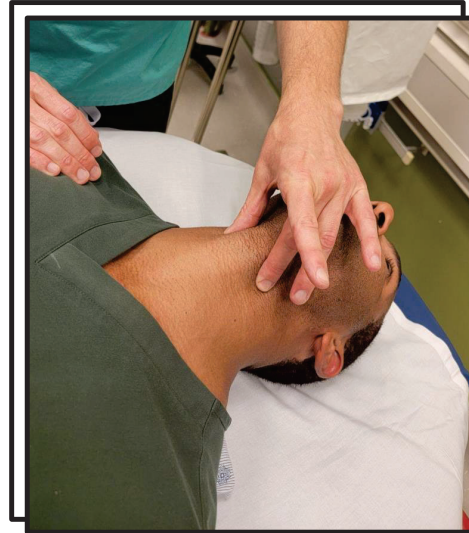


Before we begin, remember this is a



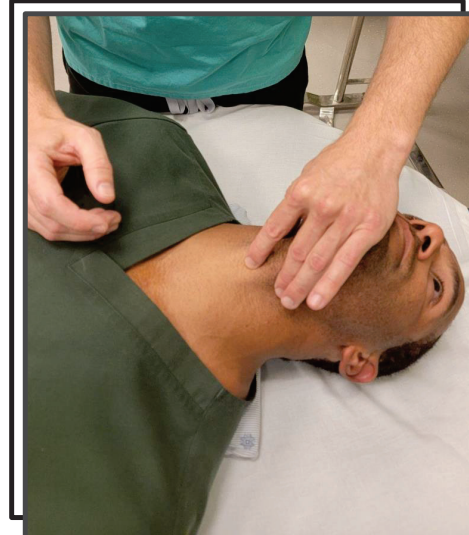
# PROCEDURAL STEPS

- With your **nondominant hand**
  - Grasp the thyroid cartilage firmly between your thumb and middle finger
  - Push the skin between your fingers down so the skin is taut



# PROCEDURAL STEPS

- With your **nondominant hand**
  - Use your index finger to feel the location of the cricothyroid membrane
- Keep this hand in the same position for the entire procedure

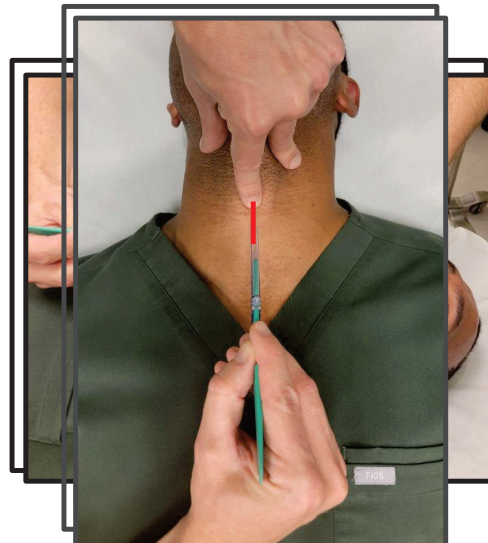


**DON'T LET GO!**

despite bleeding or movement  
until the ETT is inserted

# PROCEDURAL STEPS

- With your **dominant hand**
  - Hold the scalpel and brace your arm on the sternum
  - Make a 2-3cm vertical incision from the thyroid to the cricoid cartilage
    - The incision should be deep enough to be thru the fat layer



**ANTICIPATE BLEEDING!**

Arterial bleeding may spray  
your chest and face shield

# PROCEDURAL STEPS

- With your **nondominant hand**
  - Feel thru the incision with your index finger to confirm location of the CTM
  - Extend the incision in either vertical direction as necessary
- Stab thru the CTM membrane

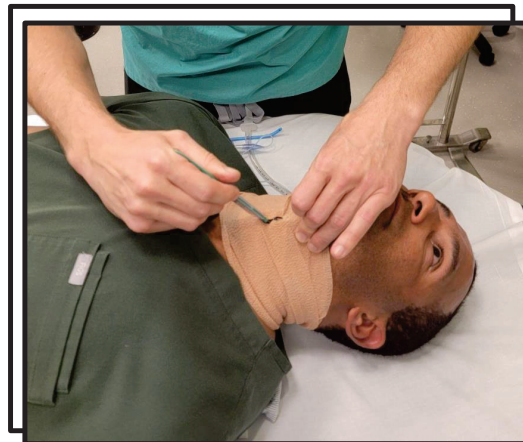
## **PATIENT MAY COUGH or MOVE!**

If your patient isn't paralyzed (or coding) blood dripping into the airway may cause coughing or movement - *DON'T LET GO!*



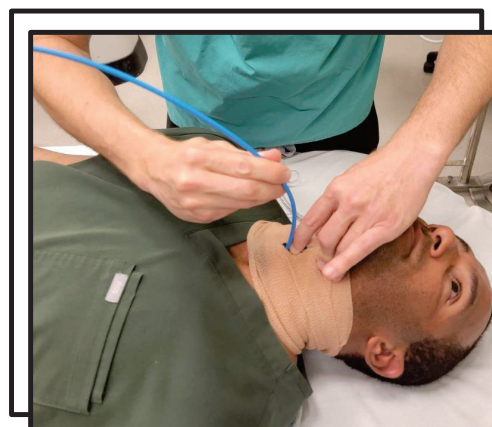
# PROCEDURAL STEPS

- While the scalpel is within the trachea, turn the blade transversely and extend the incision horizontally to widen the puncture wound
- You can now...
  - use the scalpel like a shoehorn to pull the incision cranially to make room for the bougie
  - insert a tracheal hook to grab the cartilage and bring the airway closer to the opening of the skin



# PROCEDURAL STEPS

- With your **dominant hand**
  - insert the bougie thru the incision along your finger
  - feel the bougie rub past your index finger as you advance the bougie



# PROCEDURAL STEPS

- With your **dominant hand**
  - Feed the ETT over the bougie and thru the membrane
- Depending on the size of the CTM and the size of your incision you may need to **push hard** to advance the ETT
- Inflate the cuff, ventilate the patient & secure the ETT



## “SCALPEL-FINGER-BOUGIE”



From George Kovac's  
AIME Lab. Uploaded July  
2020. URL:  
[https://www.youtube.com/  
watch?v=Q0RVlgwC9rs](https://www.youtube.com/watch?v=Q0RVlgwC9rs)

## GRAPHIC WARNING:

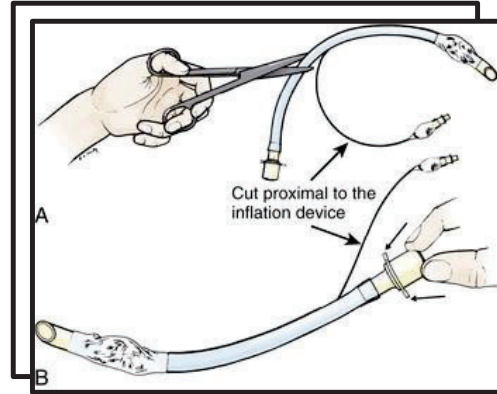


Website: <https://prehospitalmed.com/2013/02/27/actual-emergency-cricothyrotomy-video/>  
Youtube: <https://youtu.be/yfyQP4wNbcA>, From: Dr. Peter Rhee



# TIPS FOR SUCCESS

- Cut the ETT short & preload on the bougie
  - Remove the connector, cut above the tubing that leads to the pilot balloon and replace the connector
- Not everyone's CTM is the same size
  - Varies based on sex & height, always grab a 5.5 ETT
  - Anything smaller than a 5.5 won't easily fit over a bougie!
- Don't over insert the ETT!
  - Its very, very easy to right mainstem!



# TIPS FOR SUCCESS

- Use a tracheal hook to put caudal traction on the cricoid cartilage
  - Lift "up and away"
  - Brings the airway to the surface, makes it less likely that you accidentally intubate the pretracheal potential space!
- Expect bleeding to obscure the anatomy
  - Avoid the temptation to reach for suction to clear blood and help improve visualization of the underlying structures, remember this is a tactile procedure!



# PRACTICE AT HOME!



Download FREE from [thingiverse.com](https://www.thingiverse.com)



Printed for \$35 from [xometry.com](https://www.xometry.com)



# OPTIONAL EQUIPMENT

ENT Tracheal Hook Retractor 6"  
Sharp Point Surgical Medical Instruments



PRECISE CANADA Trousseau Tracheal  
Dil Forceps 5.5" Stainless Steel  
Instruments



Available from [amazon.com](https://www.amazon.com)

## THANK YOU AND GOOD LUCK!

GET A COPY OF THIS  
PRESENTATION →



A very special thank you to **Anthony Merchante, EMT-P** for modeling for this presentation

## PRACTICE AT HOME!



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