

EMS
CONSORTIUM



Tracheostomy Review and Emergencies

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Disclosures

No financial disclosures

Slides adapted from Drs.
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I've got this!

A photograph of a piece of white paper with a jagged, torn edge. The paper is set against a solid, vibrant blue background. The word "simple." is printed in a bold, dark grey, sans-serif font on the white paper. To the right of the white paper, there is a vertical strip of blue paper that appears to be a piece of tape or a binding element, also with a slightly torn edge. The overall composition is clean and minimalist, emphasizing the word "simple."

simple.

Outline

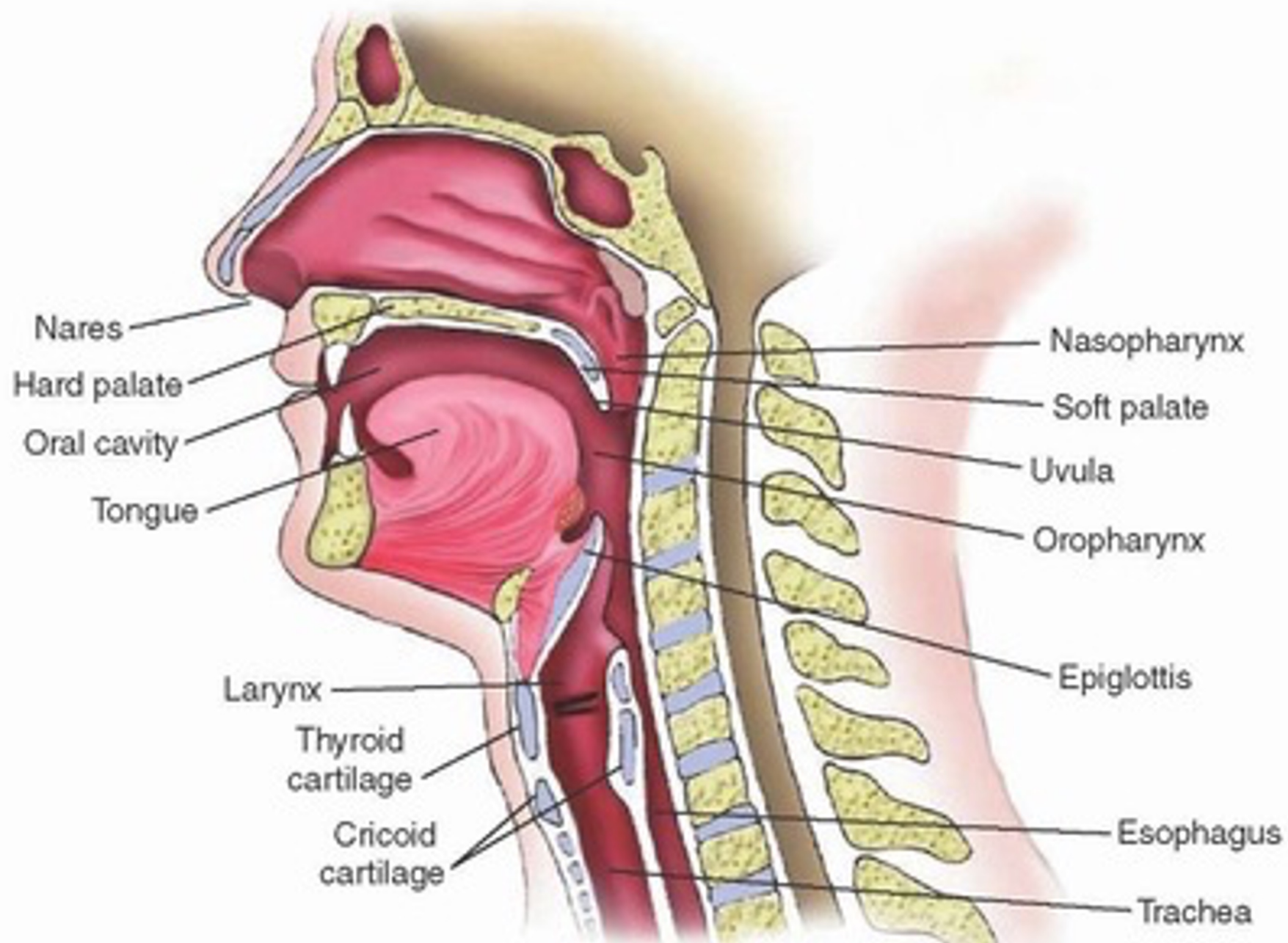
1. Airway Anatomy
2. Trach Anatomy
3. Trach Evaluation
4. Trach Emergencies
5. Trach Resources

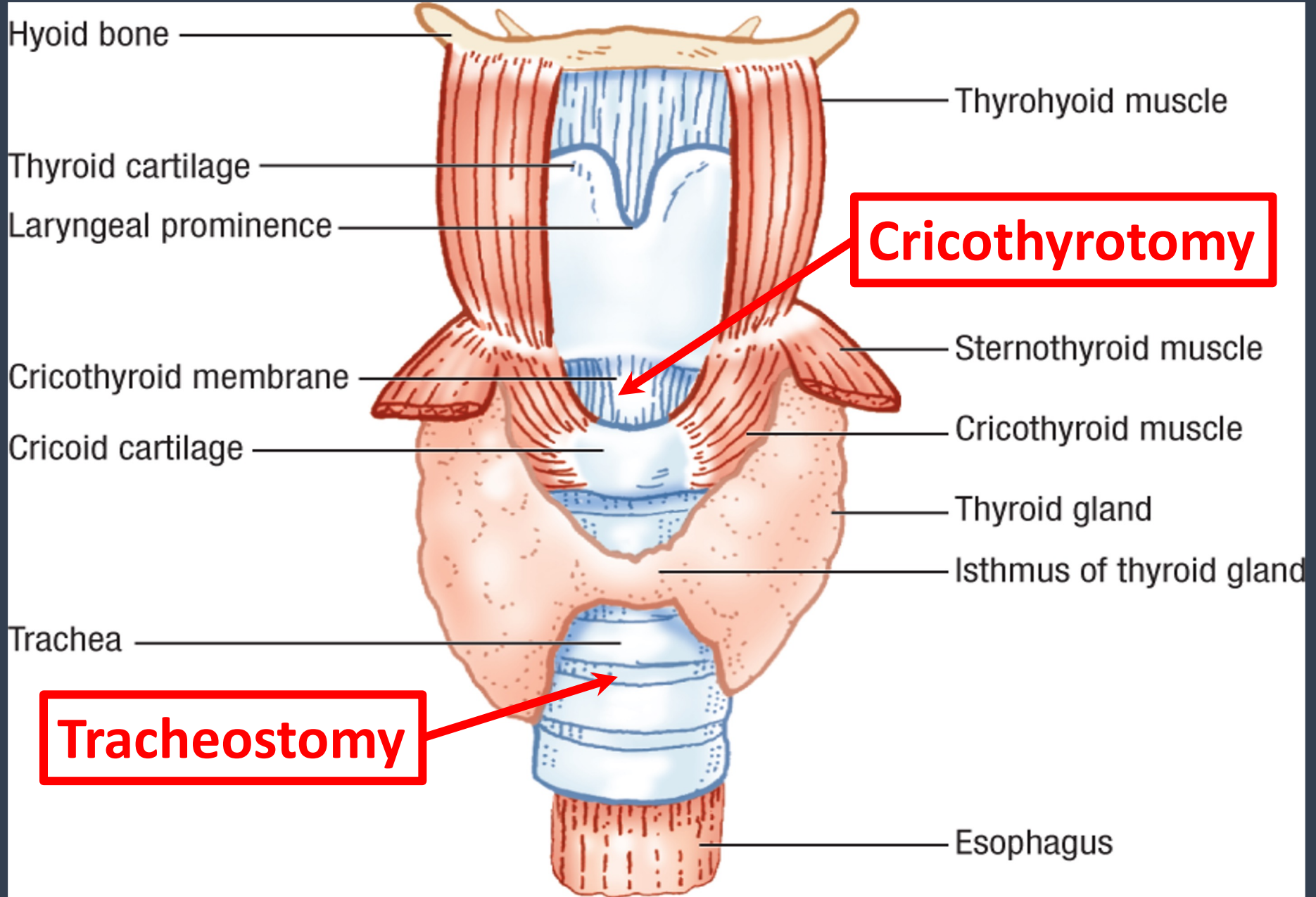


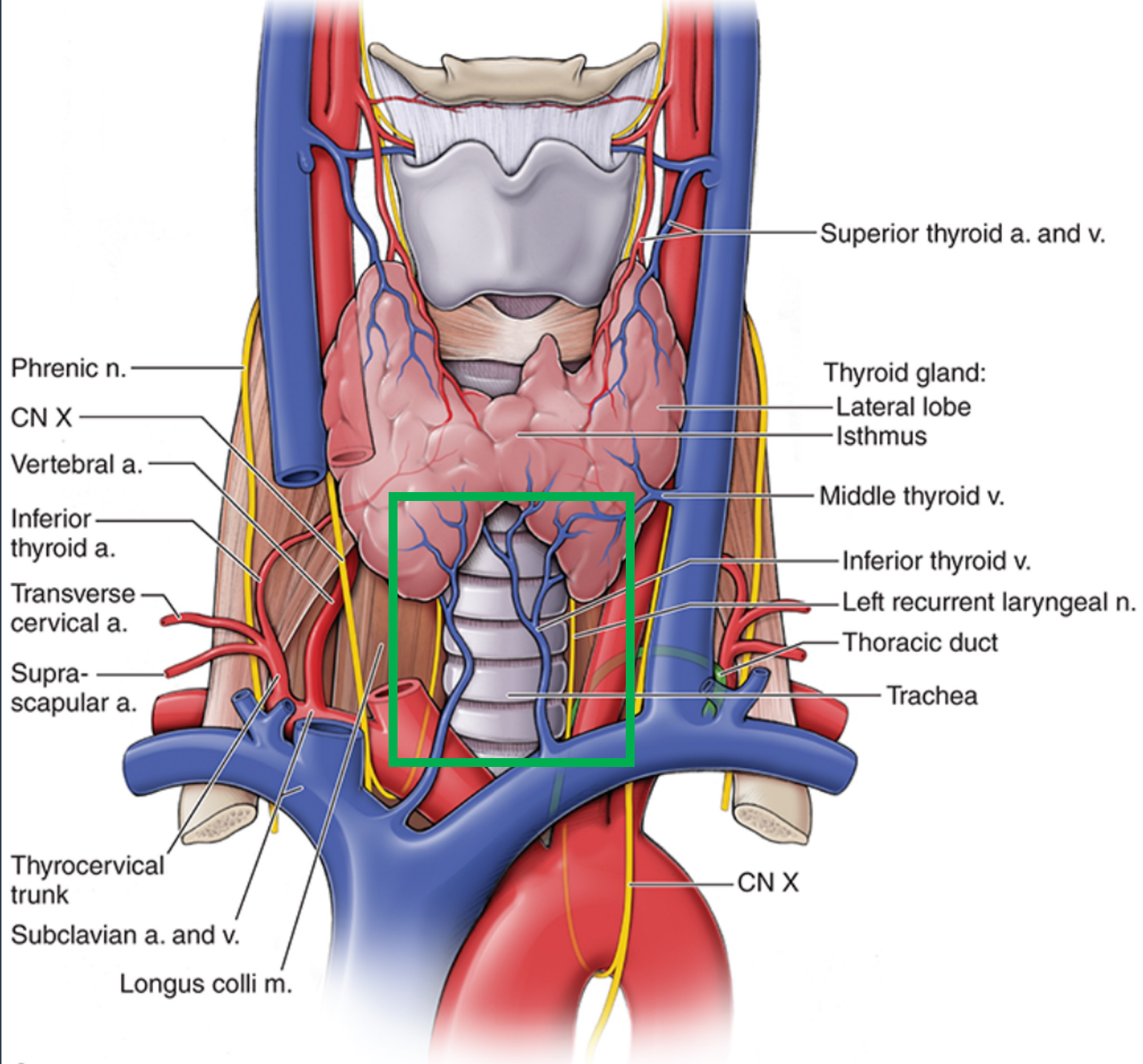
Outline

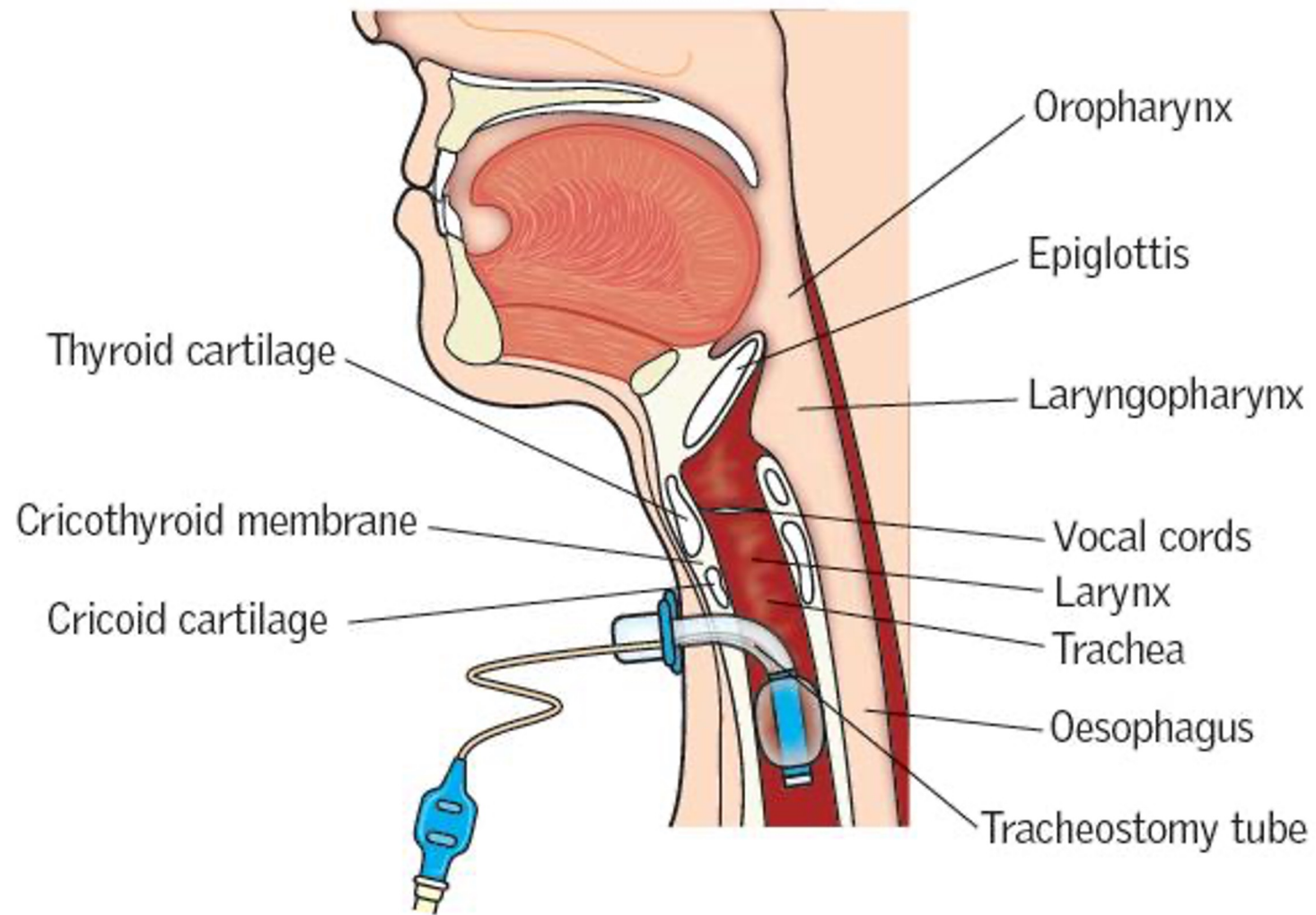
1. **Airway Anatomy**
2. Trach Anatomy
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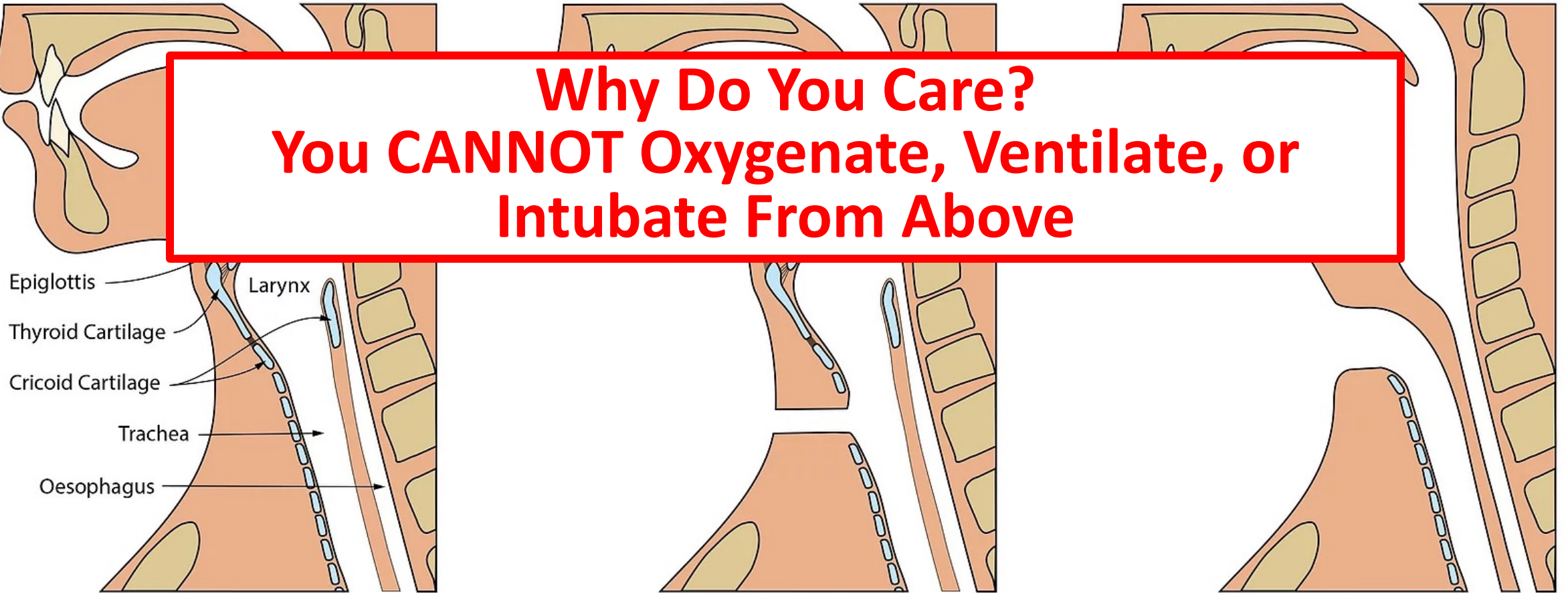






Laryngectomy Vs Tracheostomy

**Why Do You Care?
You CANNOT Oxygenate, Ventilate, or
Intubate From Above**

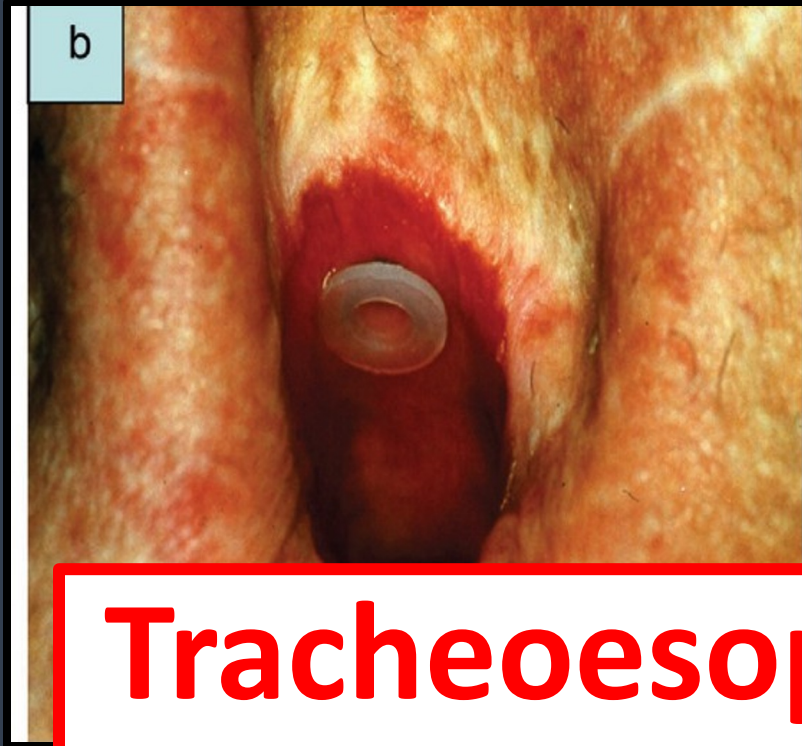


Normal Neck

Tracheostomy

Laryngectomy

What The Heck Is This?

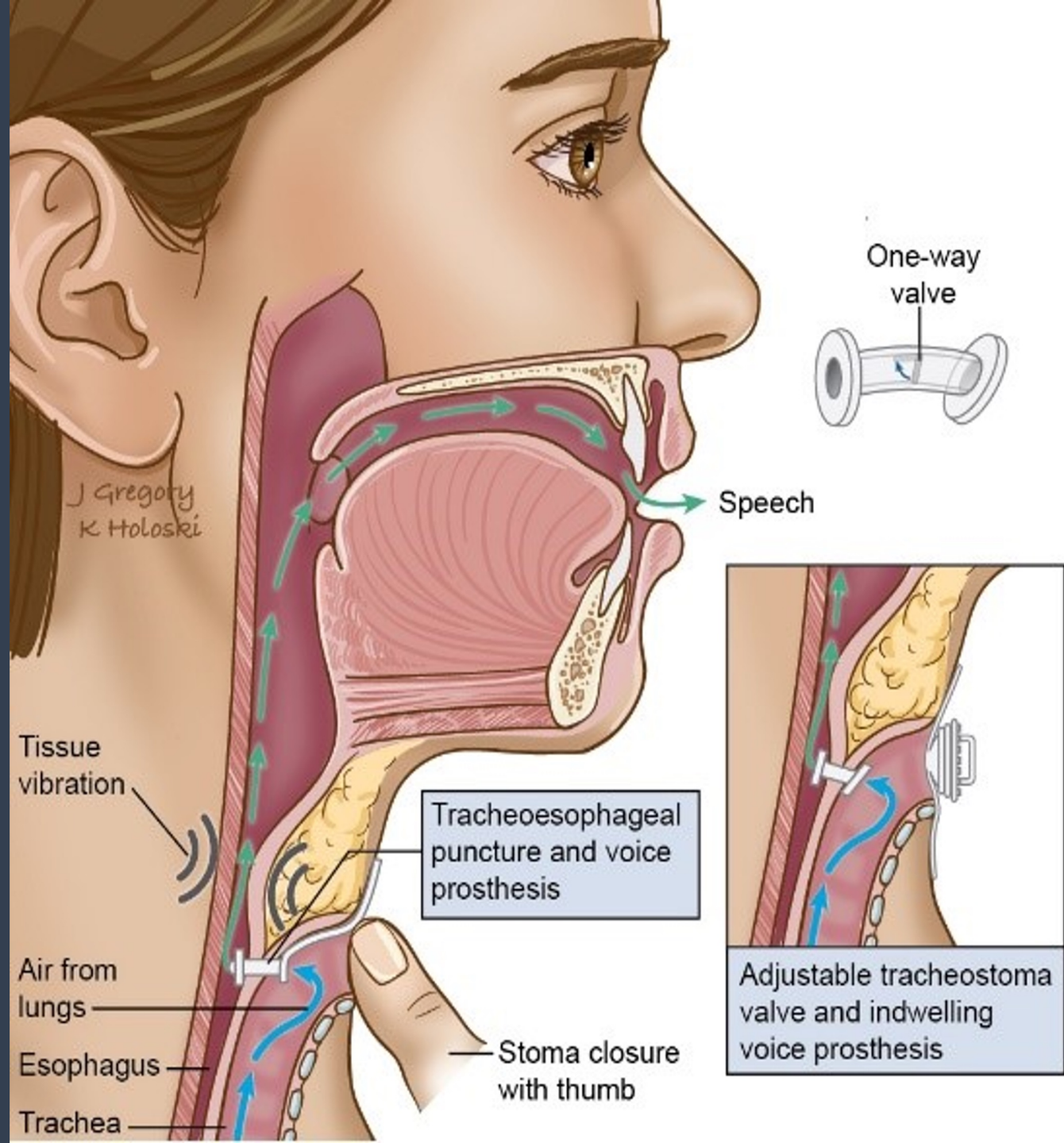


**Tracheoesophageal Puncture
(TEP)**

Why Is This Important?

**Tells You The Patient Has Had
Laryngectomy**



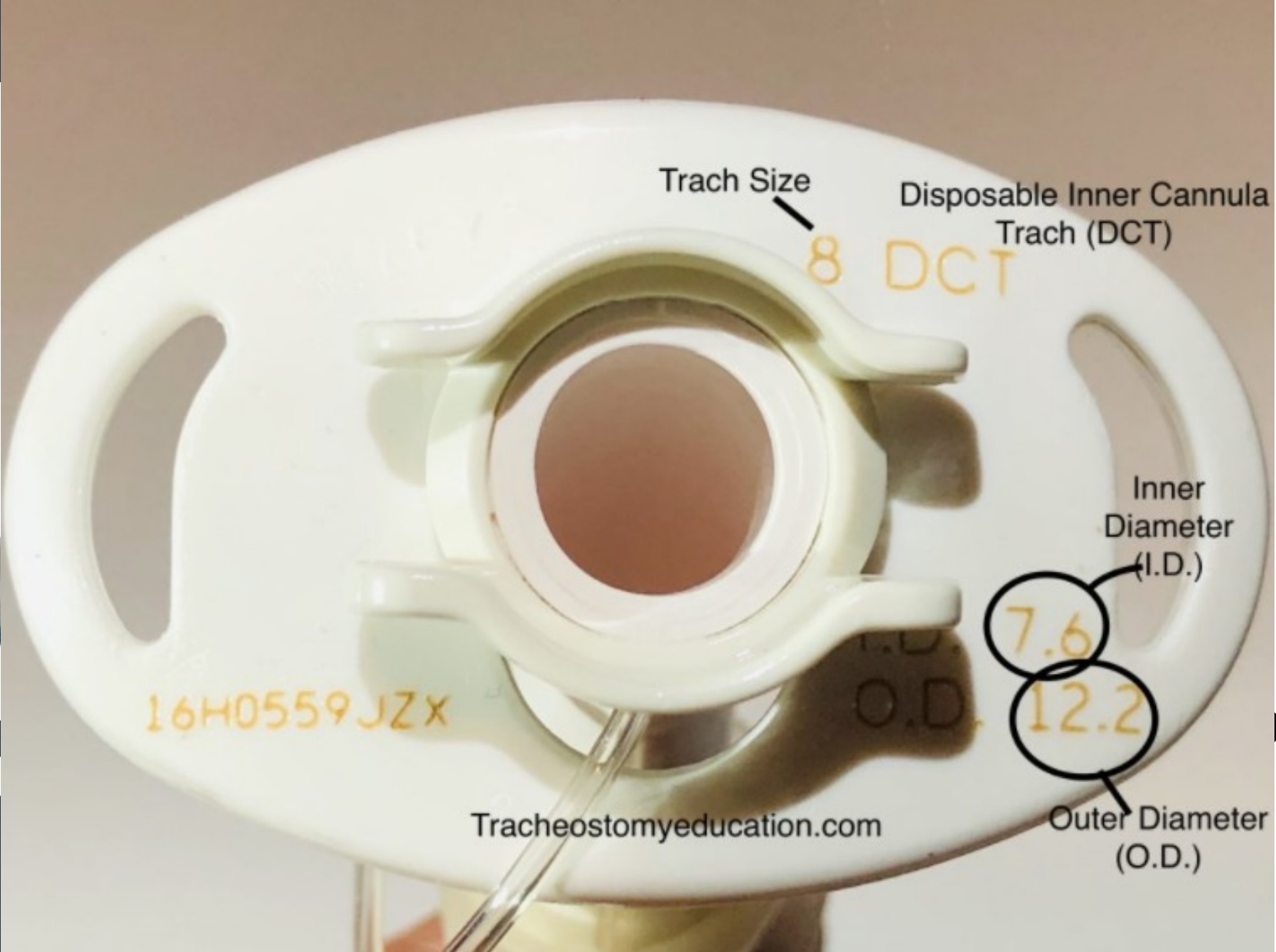


Outline

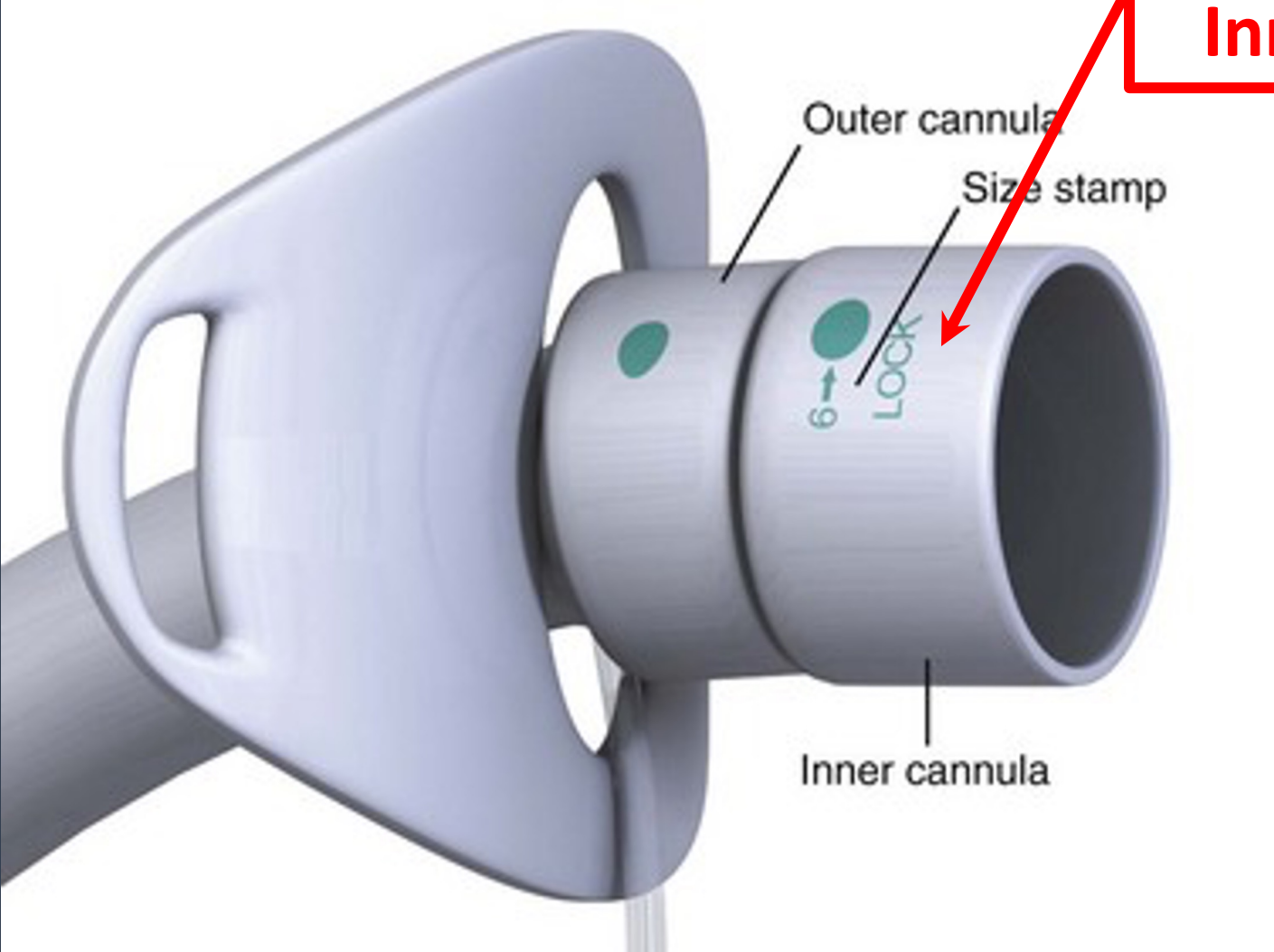
1. Airway Anatomy
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Inner

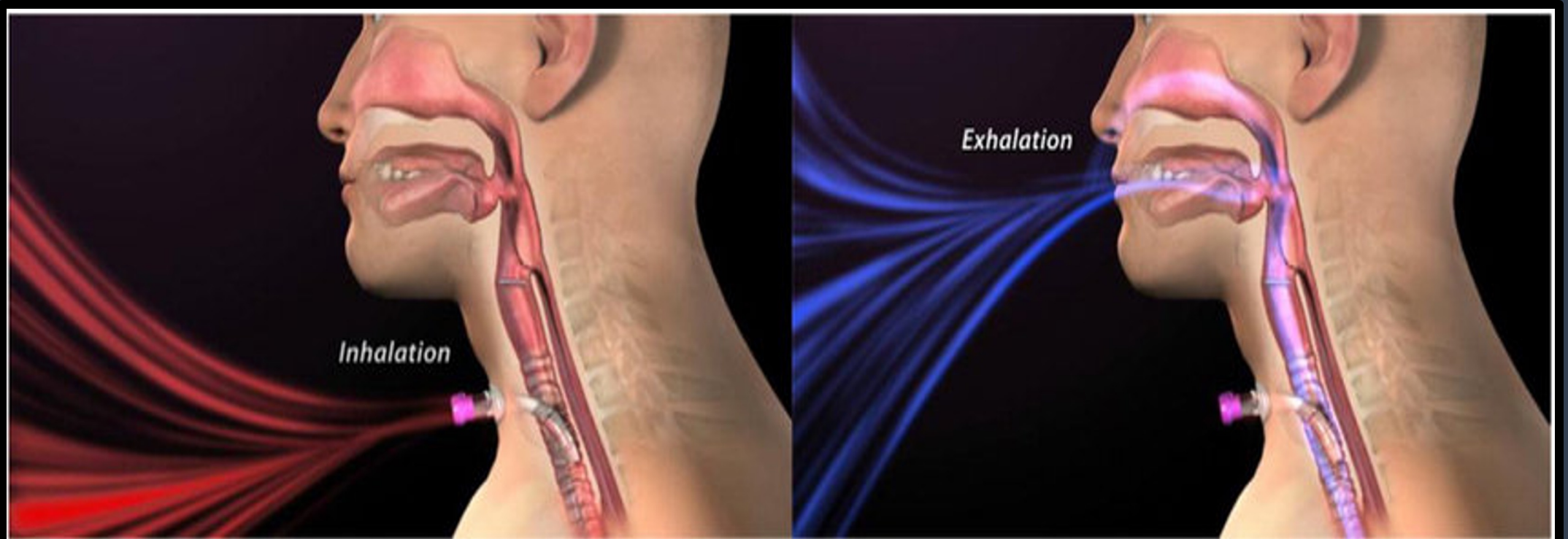


**BVM Attaches to
Inner Cannula**



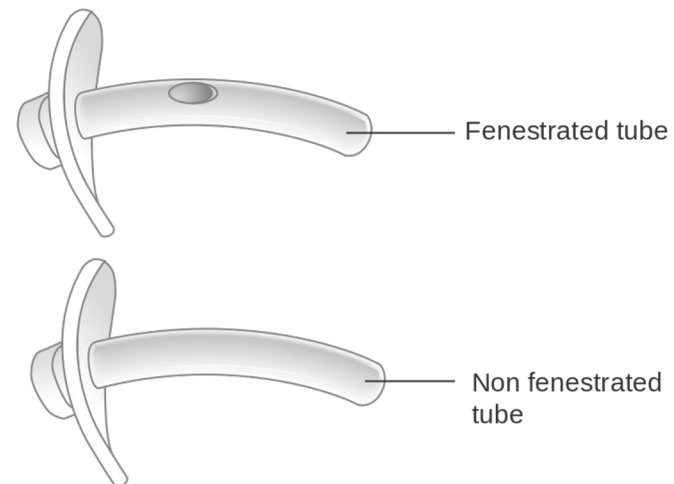
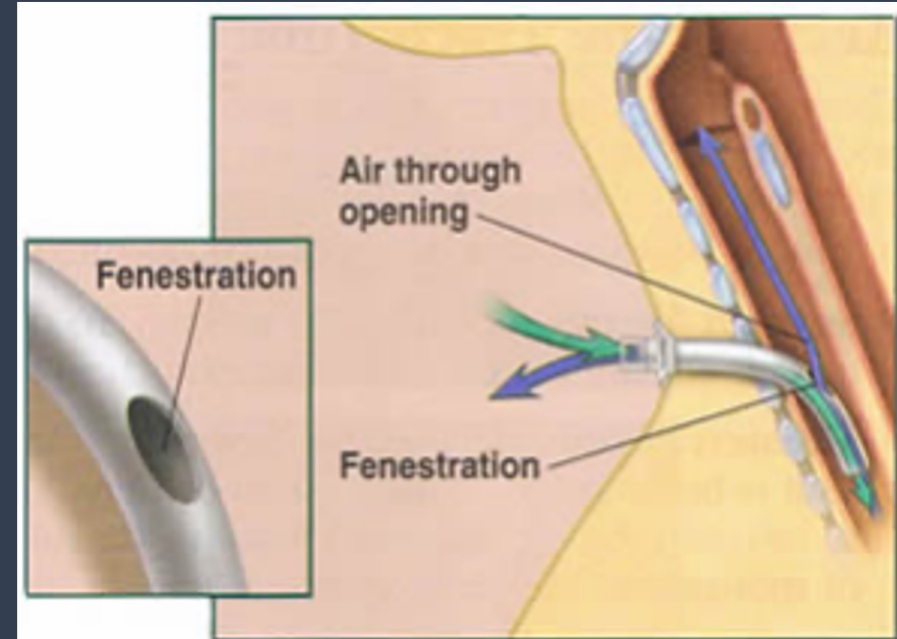
Passy Muir Valve

- One way valve for phonation
- Patient needs to:
 - Have spontaneous breathing
 - Tolerate cuffless mechanical ventilation



Fenestrated Trach

- Opening proximal to cuff
 - Allows inhalation and exhalation **around tube**
 - Allows phonation
- The last step before decannulation
 - “road test”



Modes of Oxygen Delivery



Trach Collar



Ventilator

Outline

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Reasons for Trach Placement

1. Long term mechanical ventilation
2. Dysphagia and aspiration
3. Airway Mass
4. Laryngectomy
5. Hypercapnia and Obstructive Airway Disease



Trach Evaluation



WHAT



WHEN



WHY

Trach Evaluation



WHAT



1. Kind/Size
2. Cuff/Uncuffed
3. Previous Complications



WHEN



1. Placed
2. Removed (Decannulated)



WHY



1. Was it Placed?

The Most Important Questions

1. What kind of surgery?

- Tracheostomy vs. Laryngectomy?
- What size? Cuffed or uncuffed?

2. When was it placed?

- If decannulated, when did it come out?

3. Why was it placed?



Trach Patient Evaluation - Basics



Capnography Is Helpful

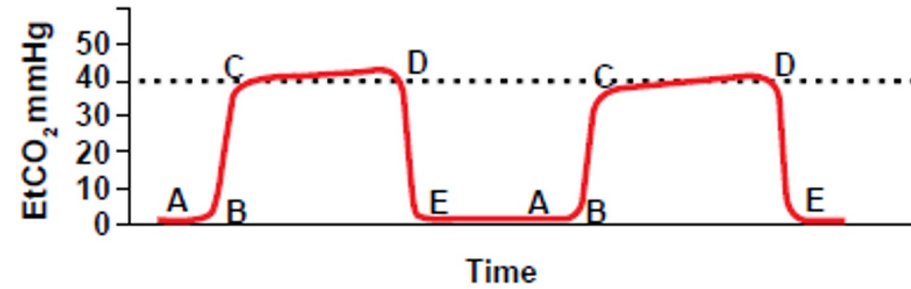


Figure 7: The normal capnography tracing.

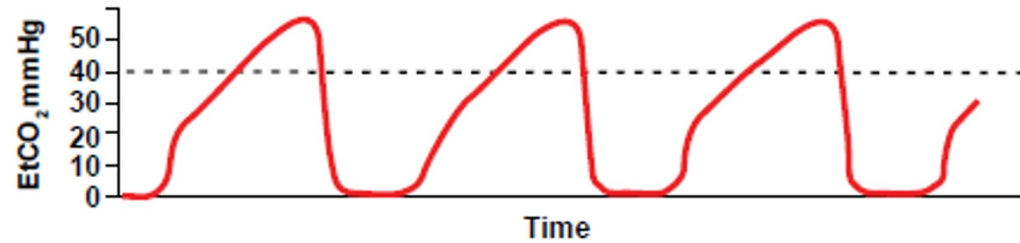


Figure 11: "Shark-fin" capnogram seen in obstructed exhalation (asthma, COPD, obstruction).

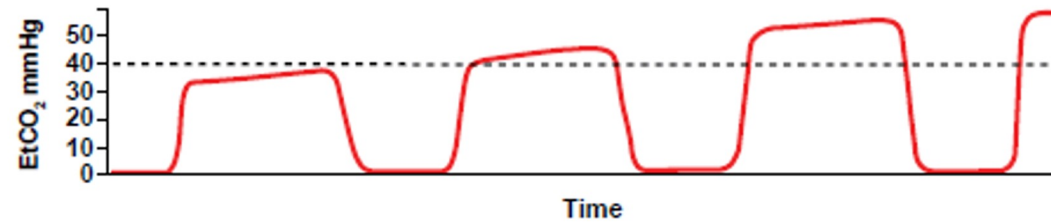


Figure 8: Capnogram illustrating hypoventilation.

Outline

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Most Common Trach Emergencies



Obstructed



**Misplaced/
Dislodged**



Bleeding



Displacement
Obstruction
Pneumothorax
Equipment
Stacked breaths

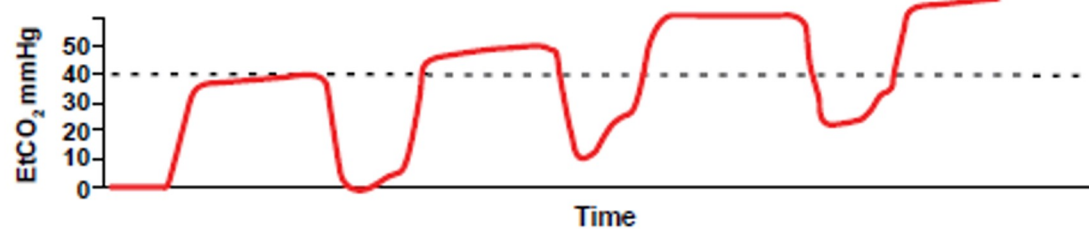


Figure 13: Capnogram illustrating incomplete inhalation and/or exhalation.

The Ventilated Patient With SOB



Step 1:
Disconnect the Ventilator



Step 2:
Attach BVM to Trach

- High pressure/resistance?
- Air leak around cuff?

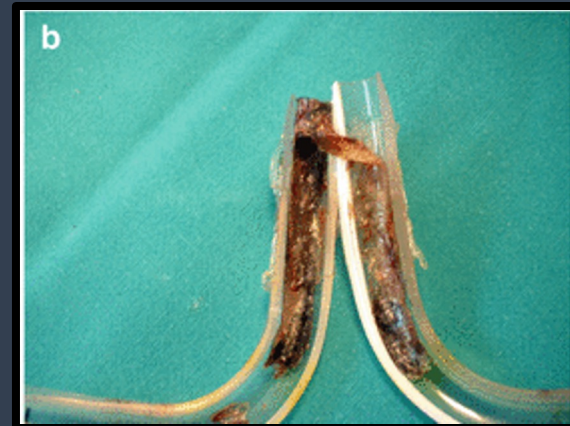
Obstruction

1. Provide supplemental O2

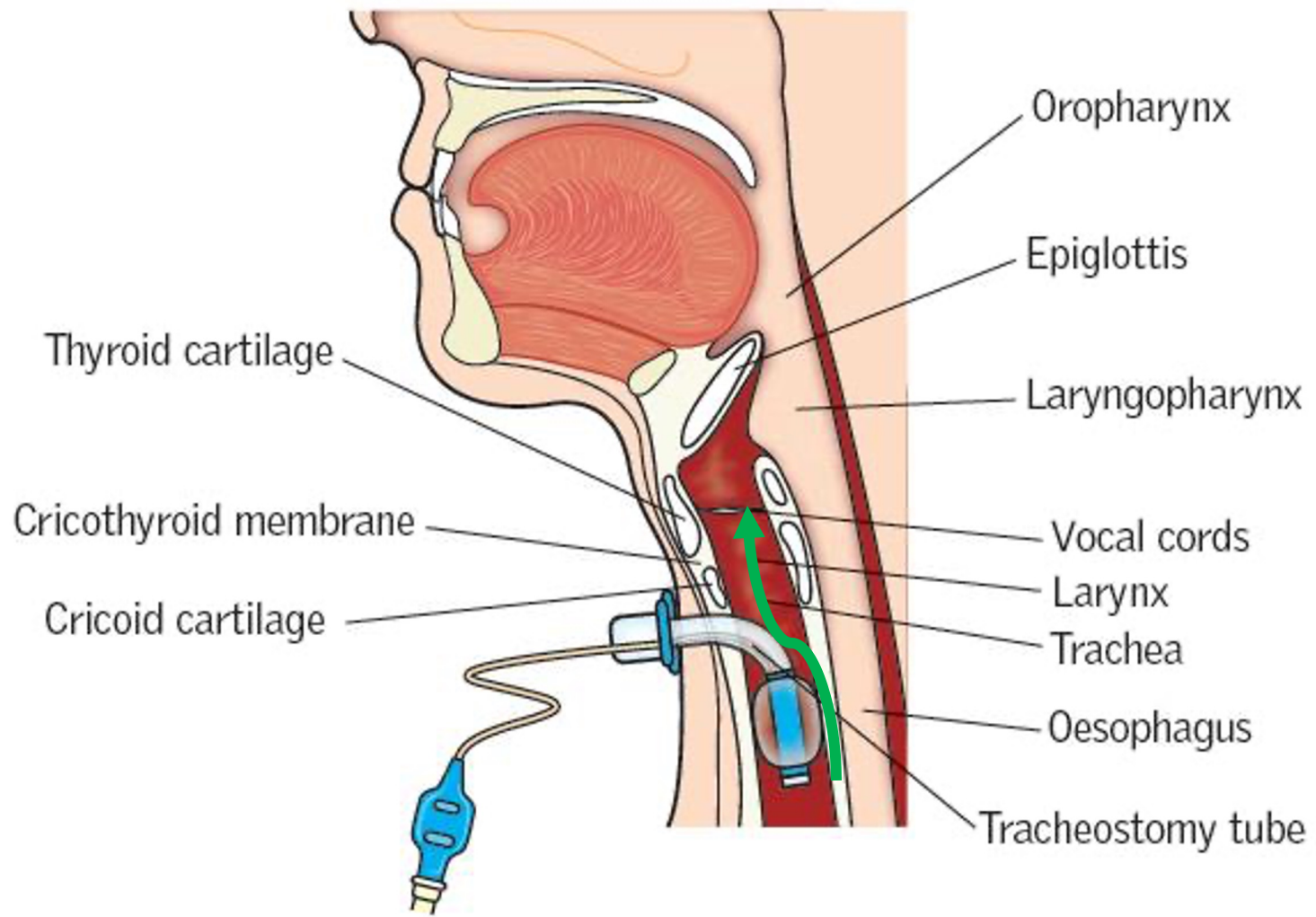
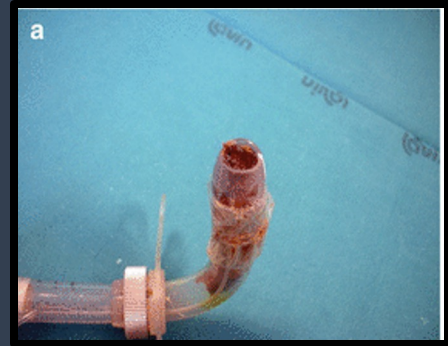


Mucus plugs are the most common source of respiratory distress

4. Attempt to pass suction
5. *Deflate the cuff if needed



a



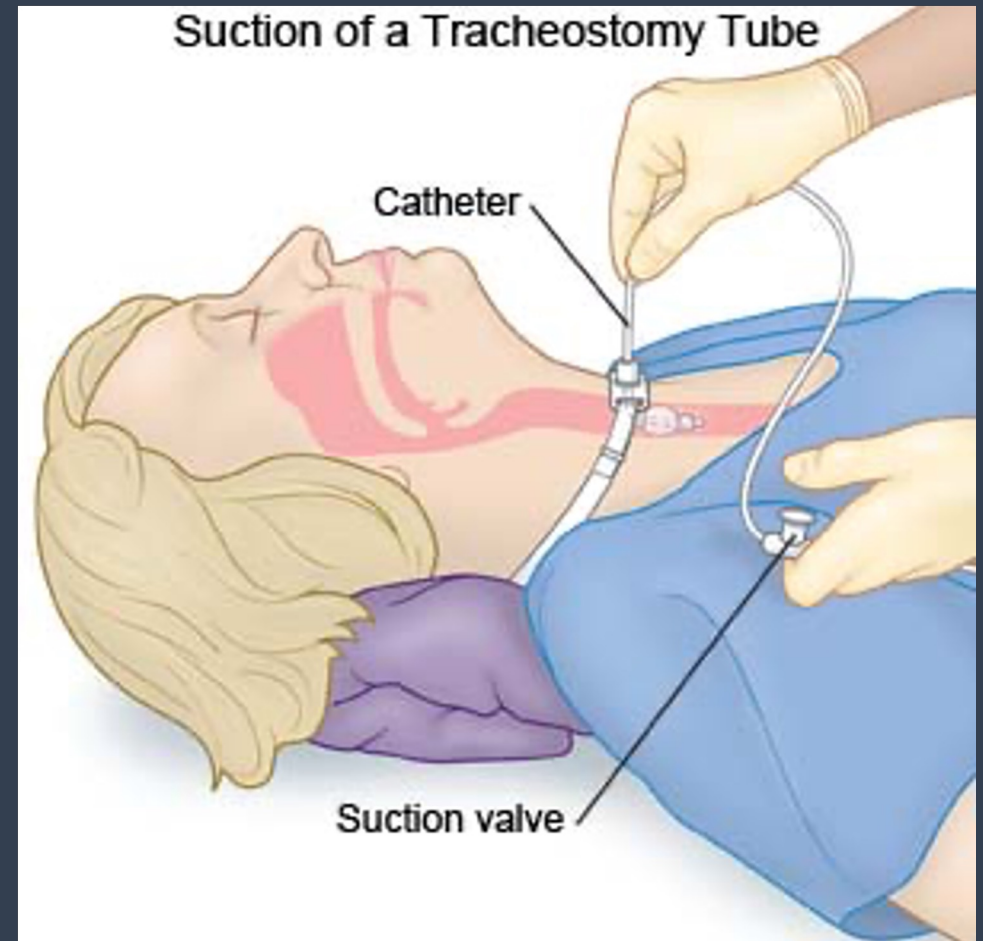
Why Mucus Plugs Form

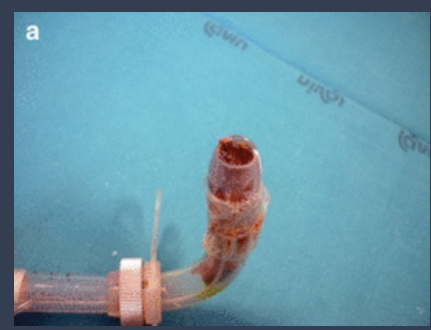




How To Suction A Trach

1. Have patient cough
2. Remove the inner cannula
3. Insert suction catheter
4. Insert up to 5mL NS
5. Suction 2-3 seconds at a time





Approach To Obstruction

- If unable to suction -> consider removal
 - Based on protocol and patient caregiver capability
- **DO NOT REPLACE if trach <7 days old**
 - Danger of creating false track and rapid closure
- Decide: Upper airway vs trach site approach for oxygenation and ventilation

Obstruction or dislodgement

Apply oxygen

Remove visible obstruction

Remove inner cannula

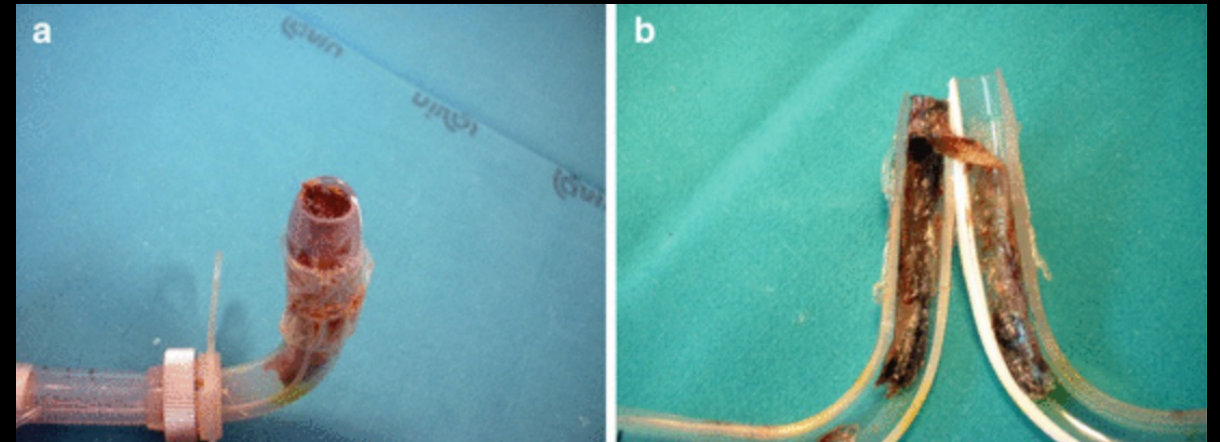
Suction

Reposition
(Patient)

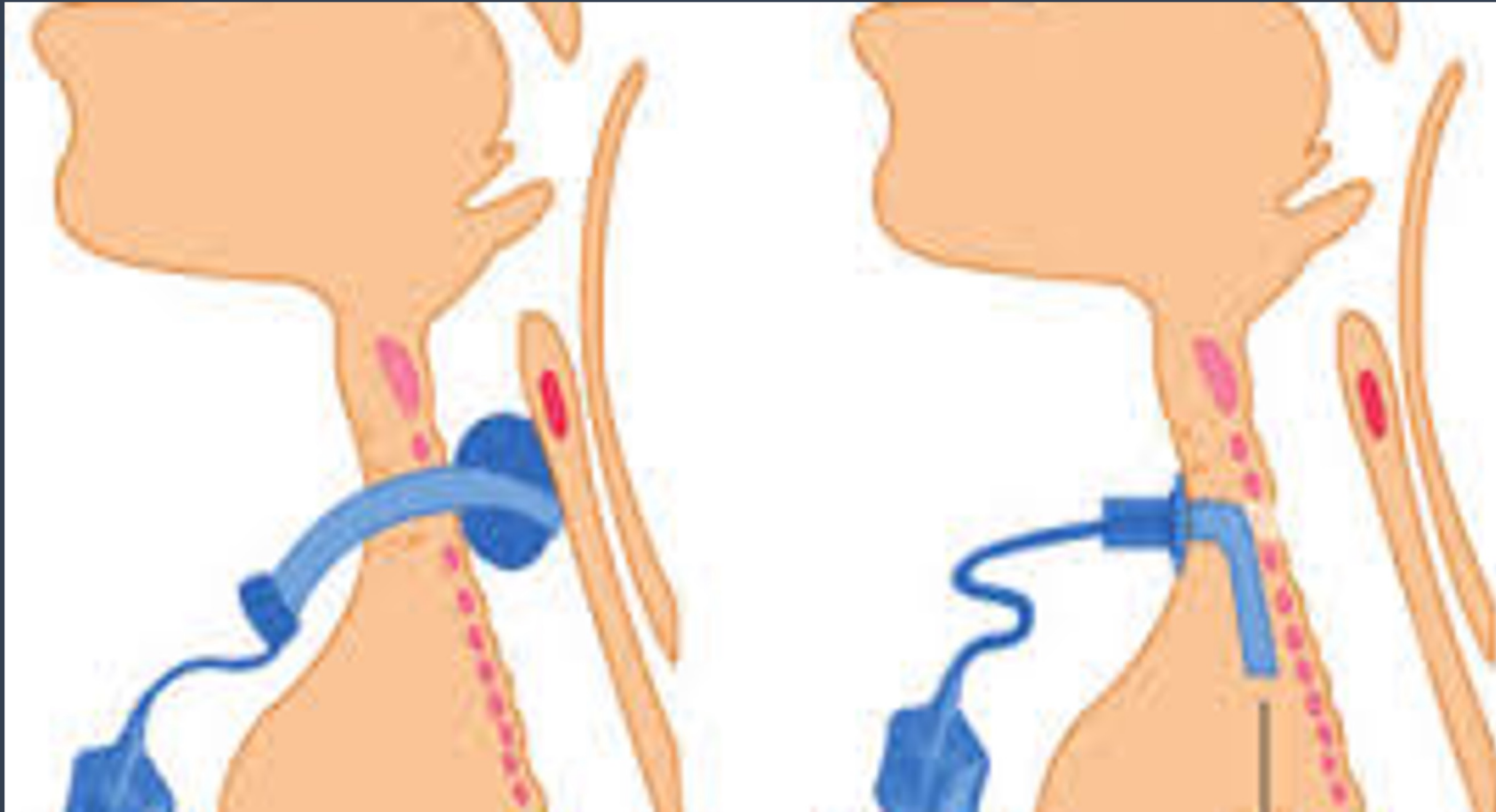
Deflate
balloon

Remove outer
cannula

Bag, intubate,
or replace
trach



This Could Also Be Your Problem

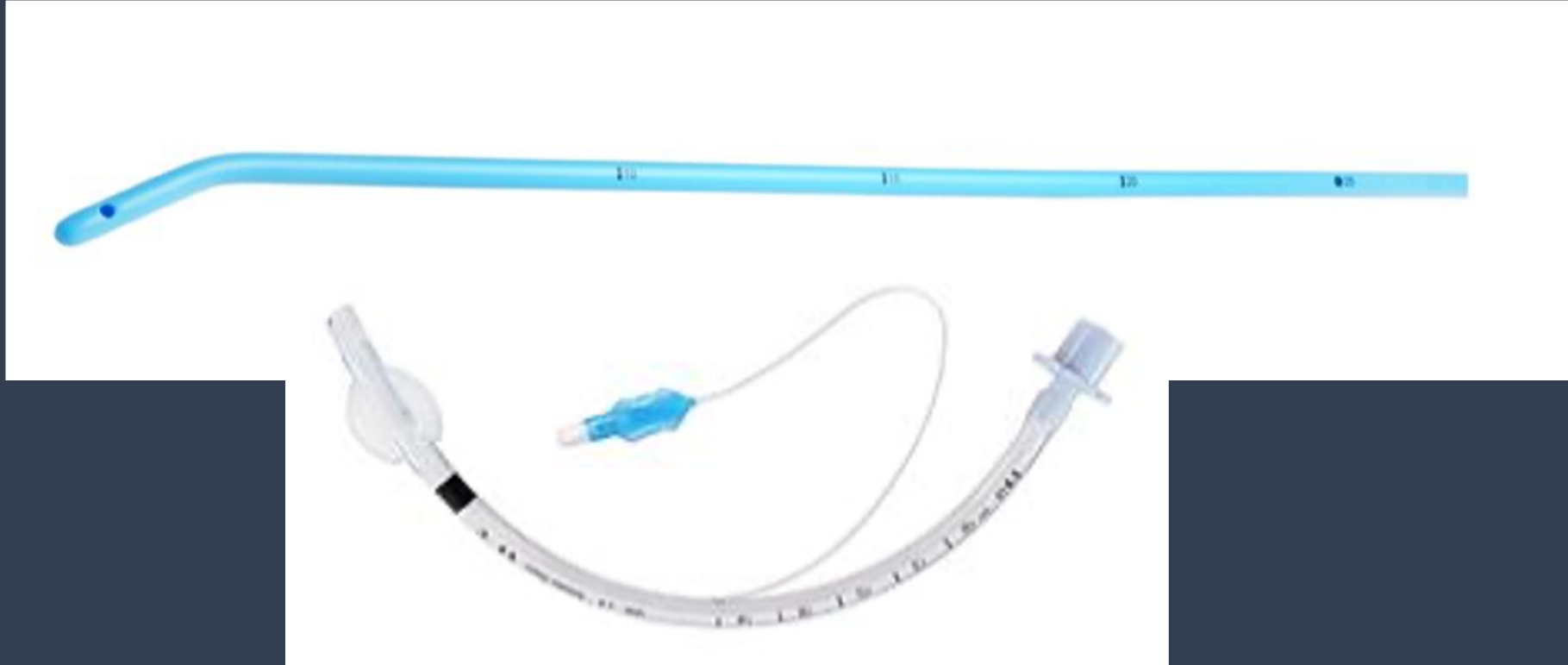


Options From Above – If Able

**You Will Need To Occlude The Stoma
To Ventilate From Above**



Options From Below



Use bougie as place holder
- Place 6.0 ETT through stoma

Replacing A Trach

1. Saline/H2O based lube to outer surface
2. Place obturator (acts like a stylet) in trach
 - Immediately remove after placement
 - OR Place bougie to guide trach into place
3. Rotate trach into place
4. Insert inner cannula
5. Confirm placement

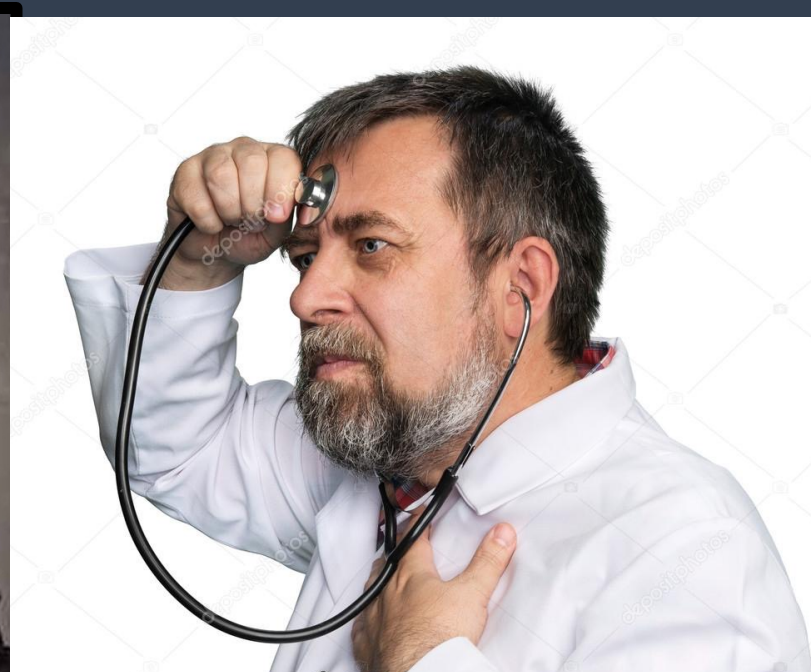




**A well established stoma may
shrink by half within 12 hours of
dislodgment**

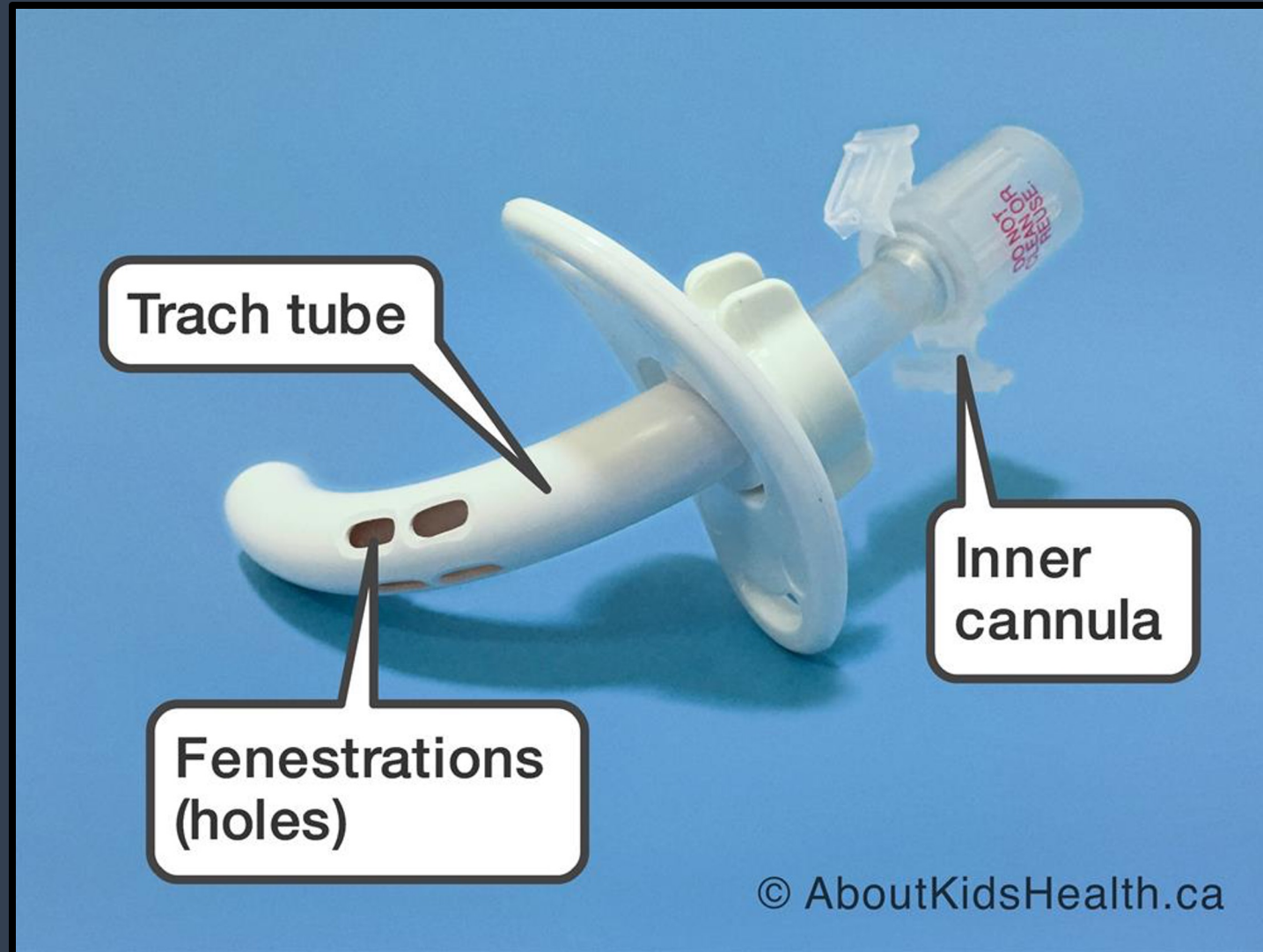


Confirming Placement

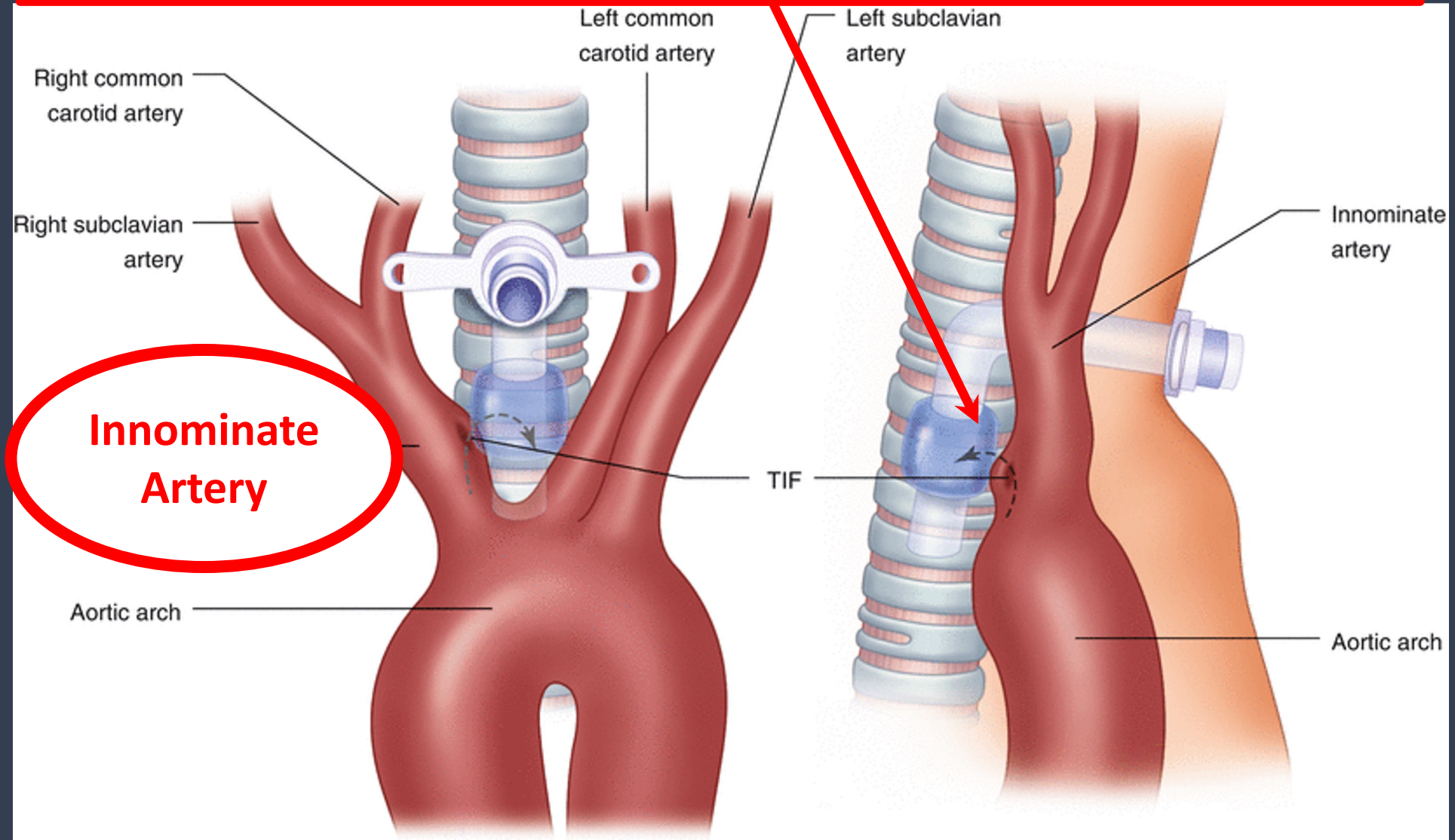


End Tidal CO₂ is King

Inner cannula must be in place in order to connect BVM or ventilator



Tracheo-Innominate Fistula



Risk factors

- Weak connective tissues
 - Tracheostomy wound infection
 - Radiation therapy to neck
 - Steroids
- Wall pressure/trauma
 - Malpositioned tube
 - Cuff over-inflation (>20 mmHg)
 - Long-term ventilation



Warning Signs

- Sentinel bleed
 - 50% before large bleed

Overall survival is 14%

- Pulsating tracheostomy tube
 - Only documented in 5% of cases
- 78% occur within 3-4 weeks of placement

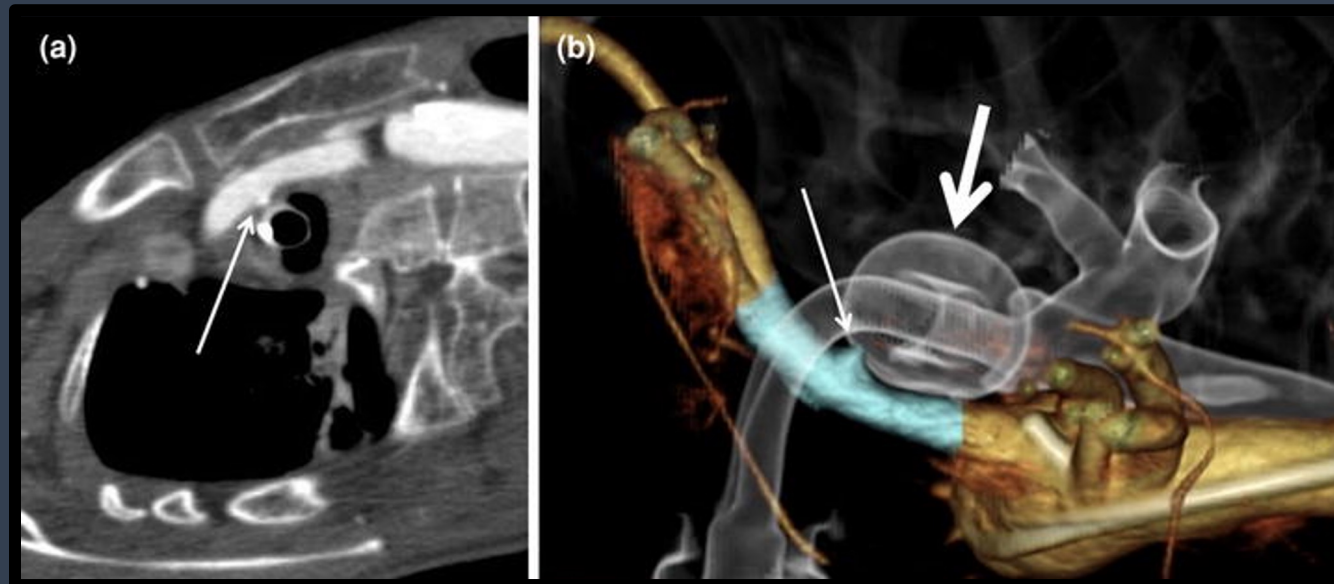


A microscopic view of a blood smear showing numerous red blood cells of various sizes and shapes, some with central pallor, and thin, branching plasma fibers. The background is a light, slightly yellowish tint.

**Treat ALL Bleeding As Life
Threatening Emergency**

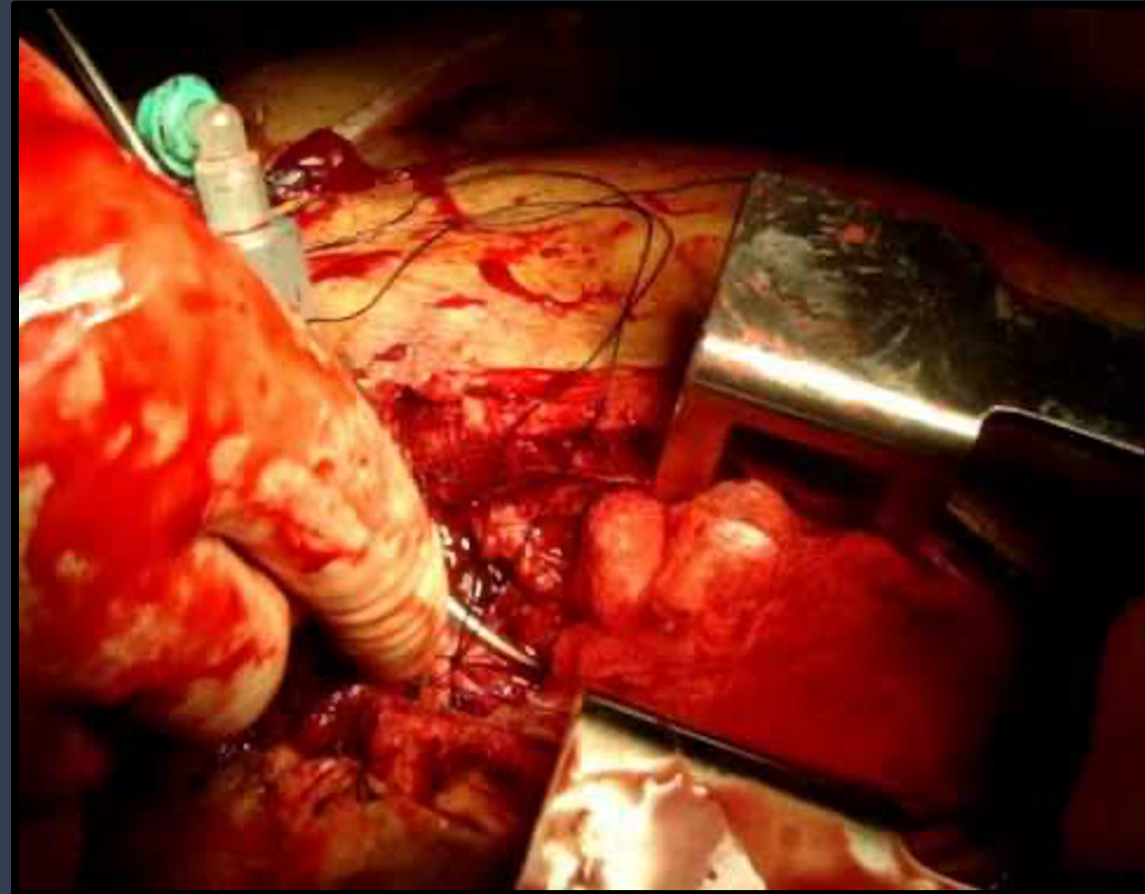
Approach To Bleeding Trach

- Get help
- PPE – All of it!
- Suction – Lots of it!
- 2 large bore IVs
- Oxygenate

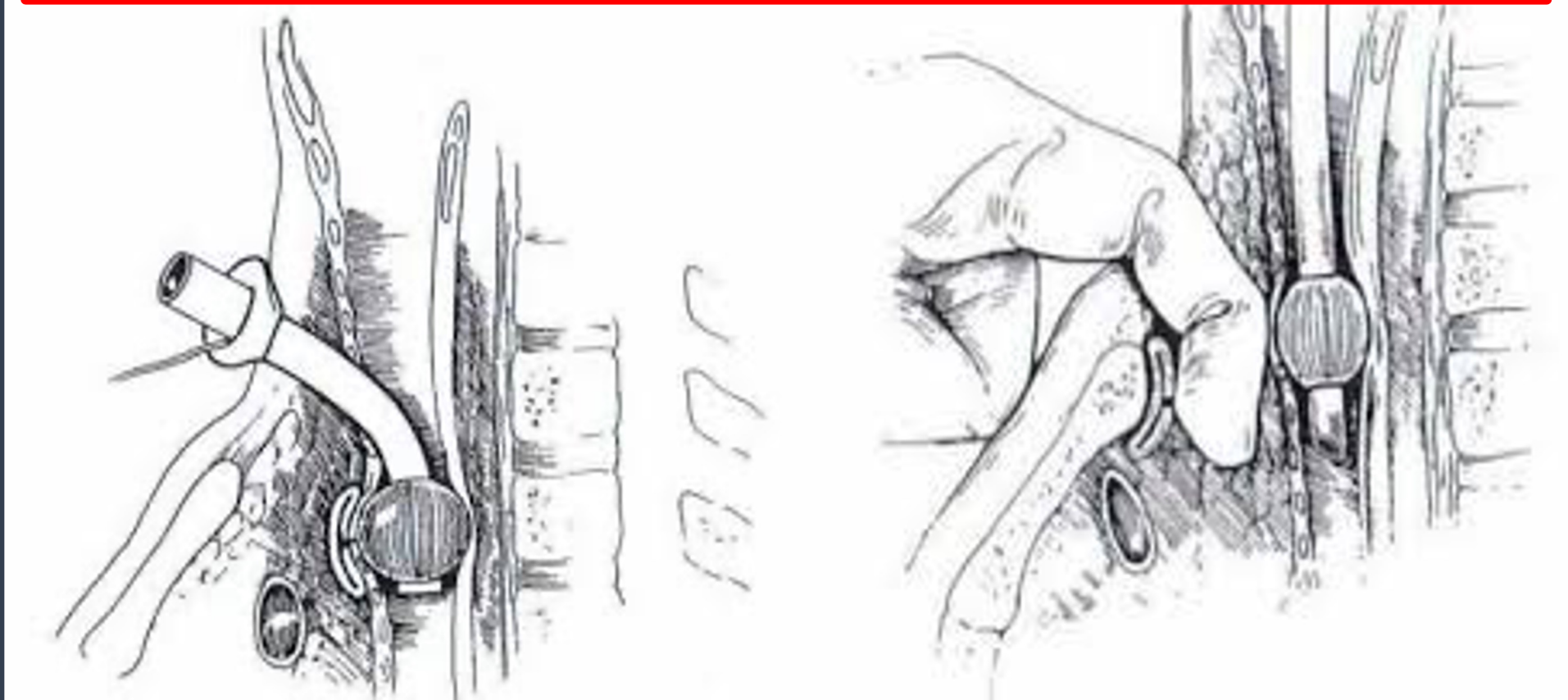


Treatment Options

- Overinflate cuff (50cc's of air)
- Slowly withdraw tube
 - Place pressure on anterior wall
- Pass oral ETT distal to lesion
- Digital compression
- Requires IMMEDIATE surgery



Just Like Any Severe Hemorrhage: The Goal Is Direct Pressure



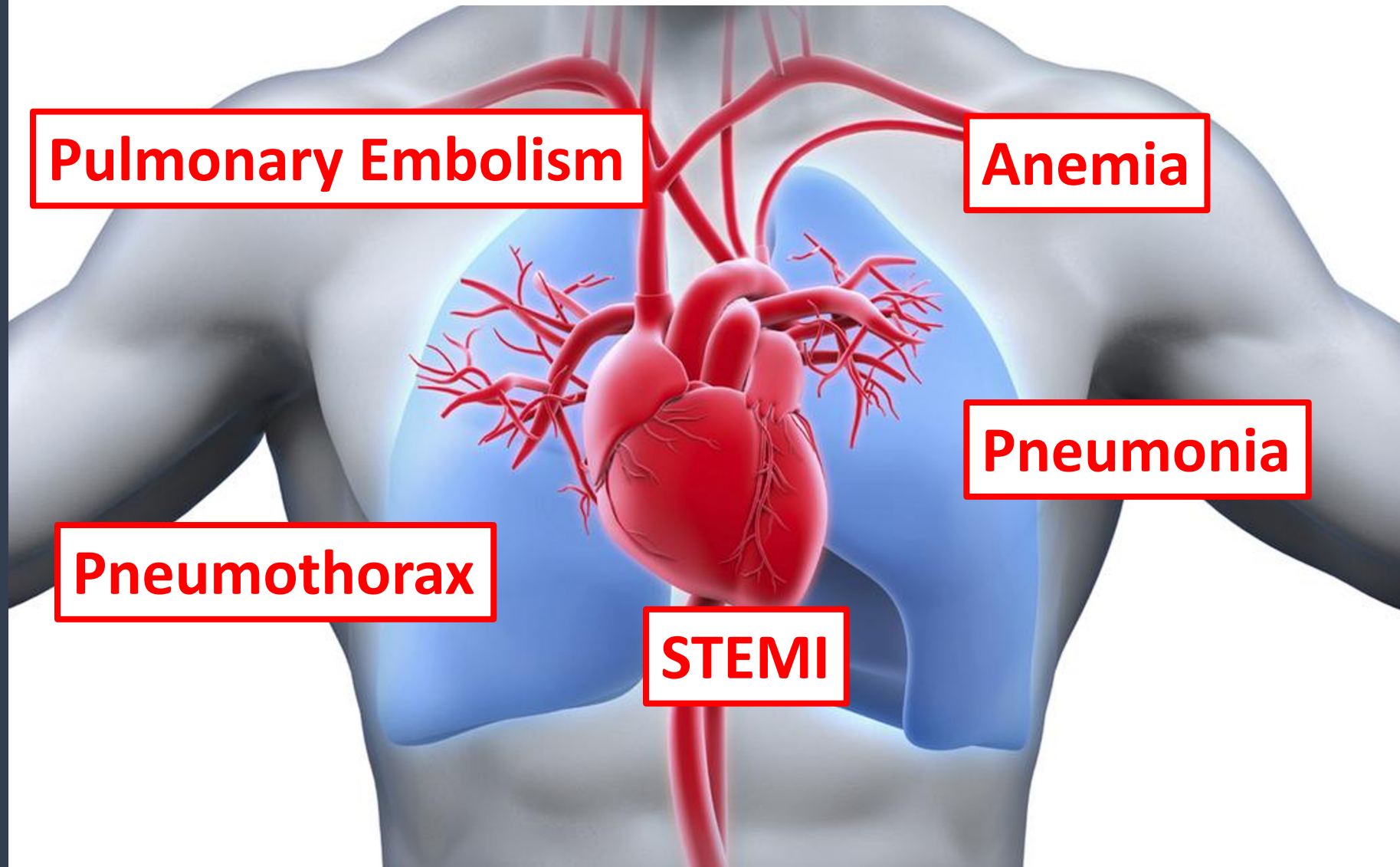
Step #1:

Over Inflate Trach Cuff

Step #2:

Digital Compression

Shortness of Breath: Don't Forget The Heart And Lungs!



Take Home Points

- 1) Laryngectomy or Tracheostomy?
- 2) Trach malfunction think obstruction – don't forget suction!
- 3) Sentinel bleeds = potential life threat



Any Questions?



National
Tracheostomy
Safety Project

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Get Trach Ready



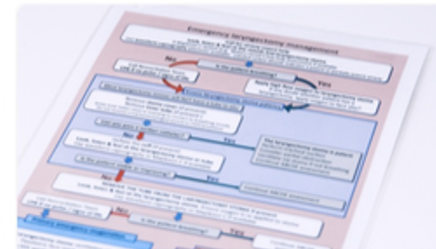
The gift of speech

Helping tracheostomy and laryngectomy patients to find a voice



Collaboration

Global collaboration to improve care



Algorithms and Bedheads

Emergency algorithms and bedhead signs



Are you trach ready?

Education and e-learning

