

The background features a dark blue gradient with faint, light blue technical diagrams. On the left side, there is a large circular scale with numerical markings from 140 to 260 in increments of 10. Several circular diagrams with arrows and dashed lines are scattered across the background, suggesting a technical or medical context.

# AIRWAY MANAGEMENT AND RESPIRATORY COMPROMISE IN ORTHOPEDIC TRAUMA

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# DISCLOSURES

- There has been no financial compensation provided for this presentation nor are there any known conflicts of interest.

Except for...

I actually didn't get paid for this and there really are not any conflicts of interest. I just want to write something in super tiny fine print.



# LEARNING OBJECTIVES

- Discuss airway management techniques for orthopedic trauma patients
- Discuss regional anesthesia and risk assessment for trauma patients

# OUTLINE

- Have an understanding of what makes trauma patients unique
- How the acute nature of trauma affects airway management
- In what ways does trauma affect overall anesthetic choices

# INITIAL ASSESSMENT AND THE NEED FOR ARTIFICIAL AIRWAY

- This will vary greatly depending on whether you're "in the field" or...
- In a controlled setting such as a hospital (Operating Room vs. Emergency Department/Trauma)

# IN THE FIELD

- Is airway protection required?
- Dire straits? (great band, bad for patients). For example, mechanical loss of airway or obstruction, severe neurological injury, severe lung injury (mechanical, chemical, other exposure).
- Or....

# IN THE FIELD

- Is there time for transport? If so, then less invasive measures such as O<sub>2</sub> via nasal cannula, face mask, etc. can be used.

# PITFALLS OF AIRWAY MANAGEMENT IN TRAUMA

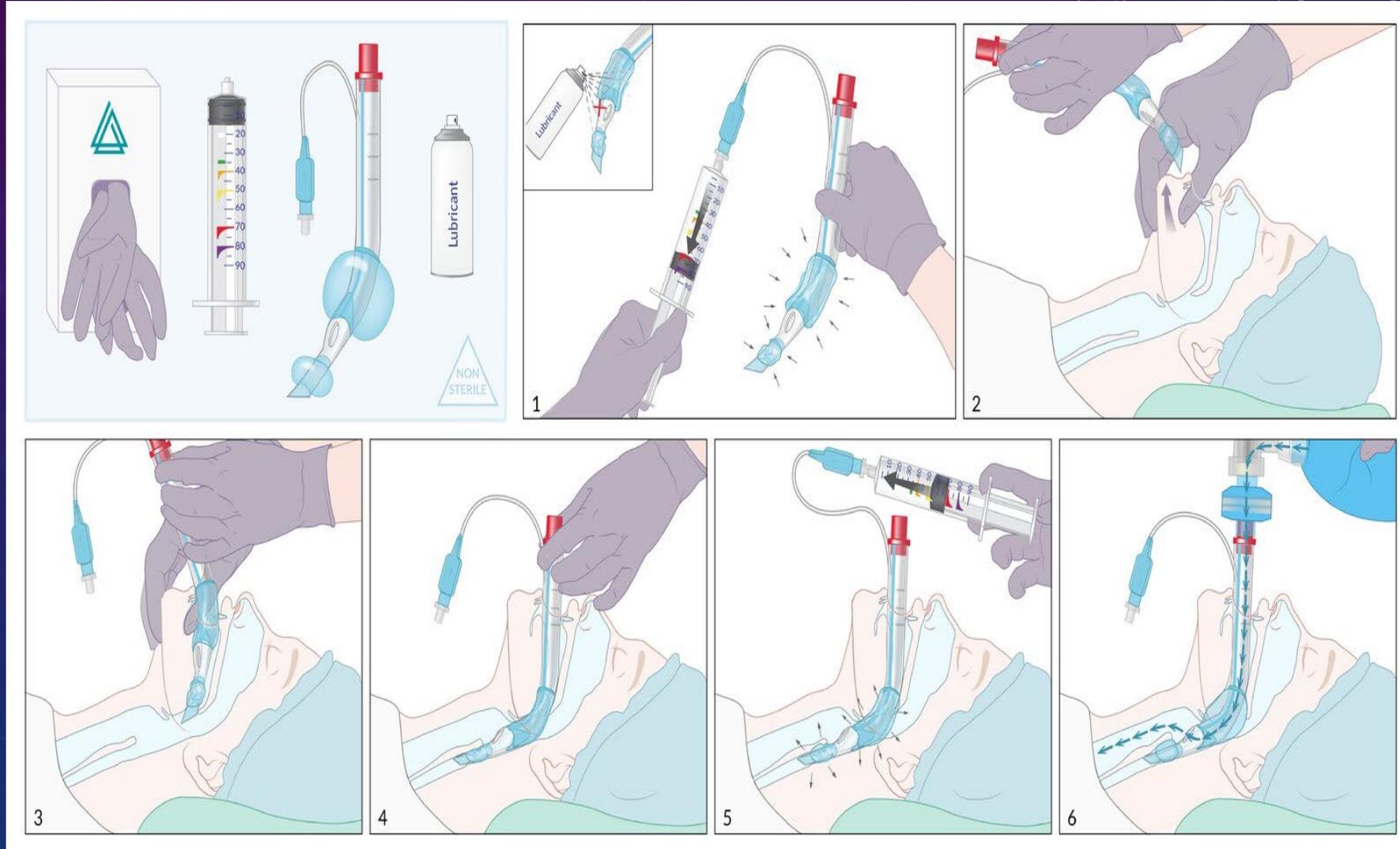
- Patient related factors such as...
- Cervical trauma
- Mechanical obstruction such as foreign objects, debris, blood, secretions, gastric contents
- Body habitus
- Combative?
- Physiologic issues such as shock
- Location or environmental issues

# CHOICE OF AIRWAY

- Supraglottic vs. subglottic

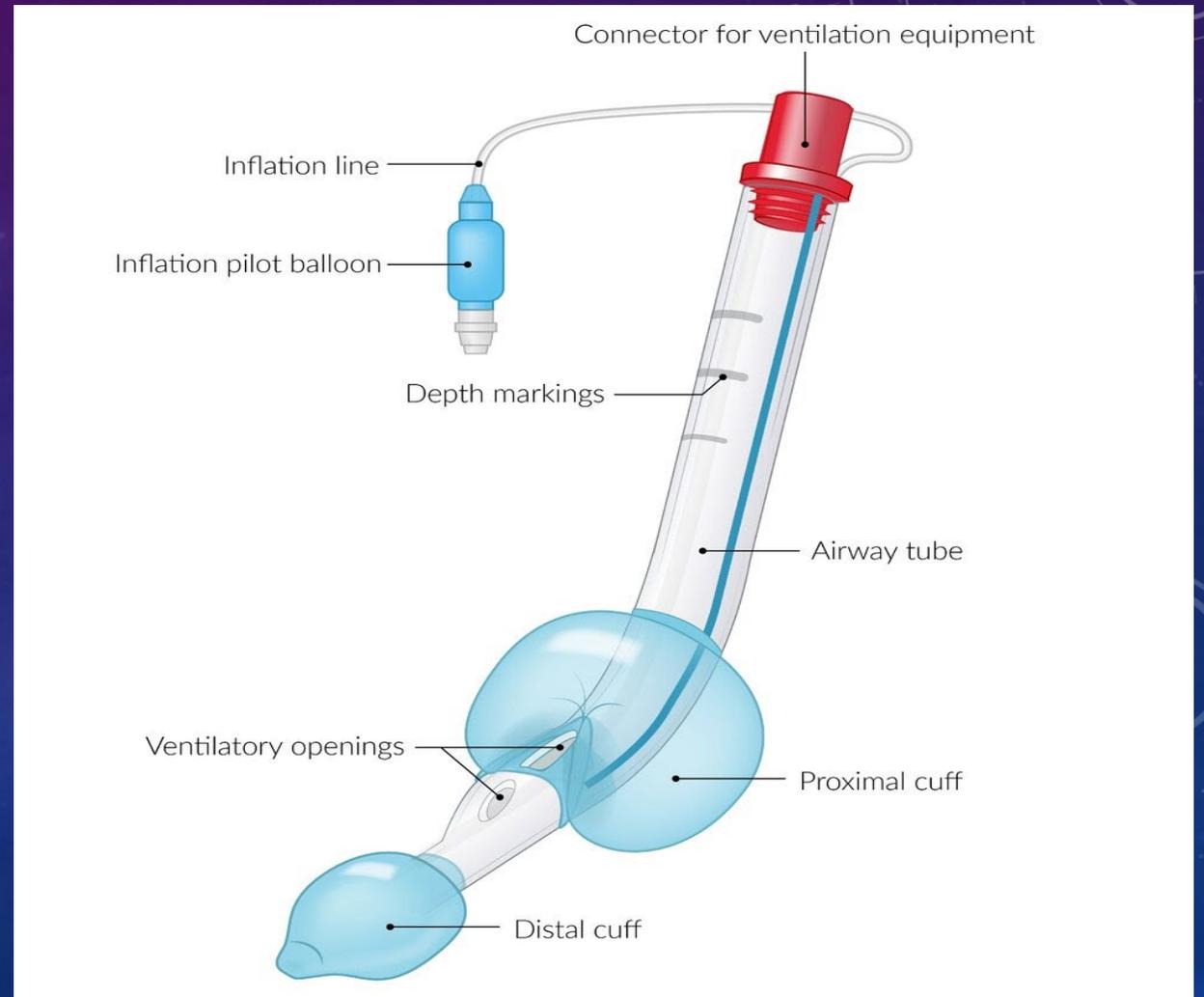
# CHOICE OF AIRWAY

- Supraglottic
- Laryngeal Tube Airway (LTA)



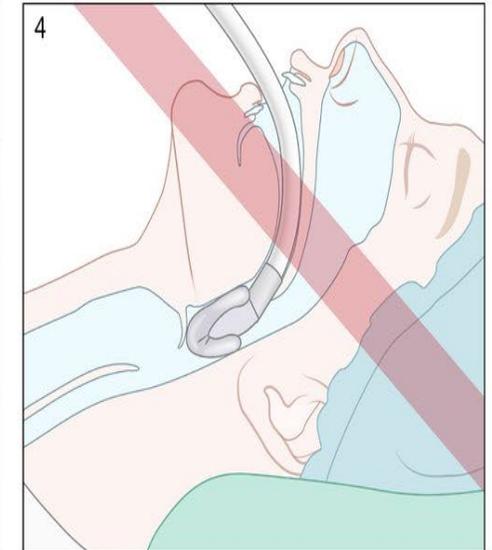
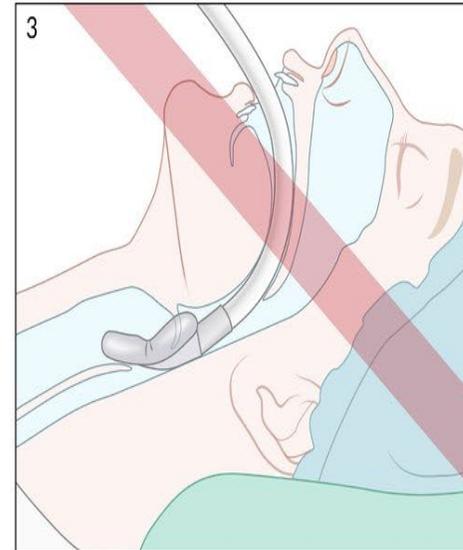
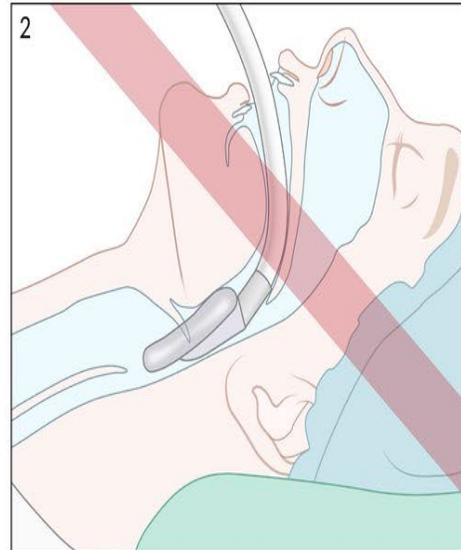
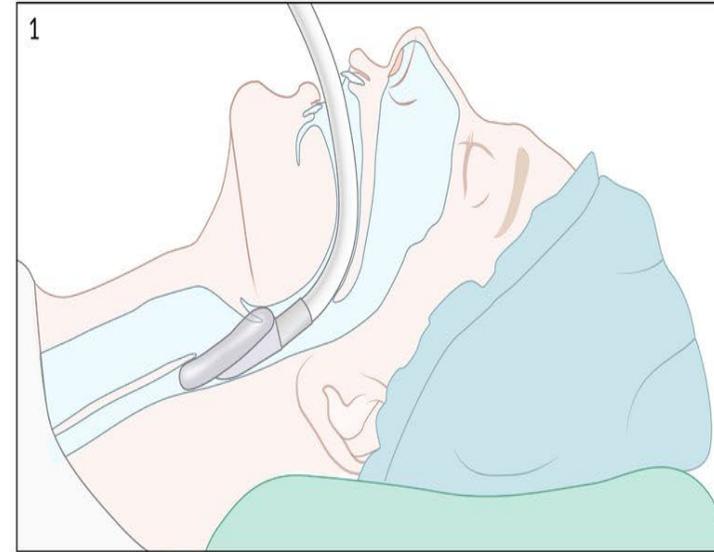
# CHOICE OF AIRWAY

- Supraglottic
- Laryngeal Tube Airway (LTA)



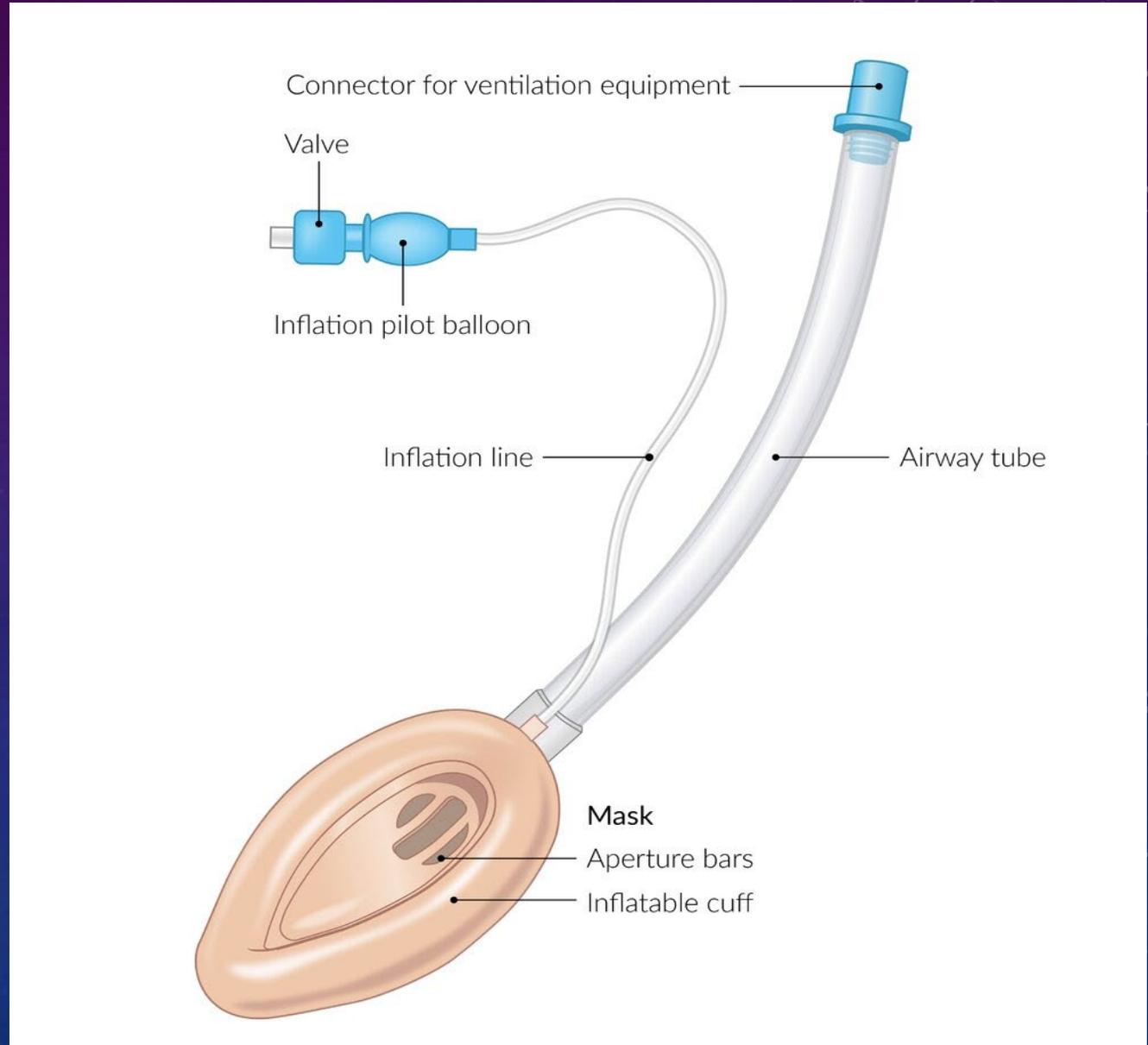
# CHOICE OF AIRWAY

- Laryngeal Mask Airway (LMA)



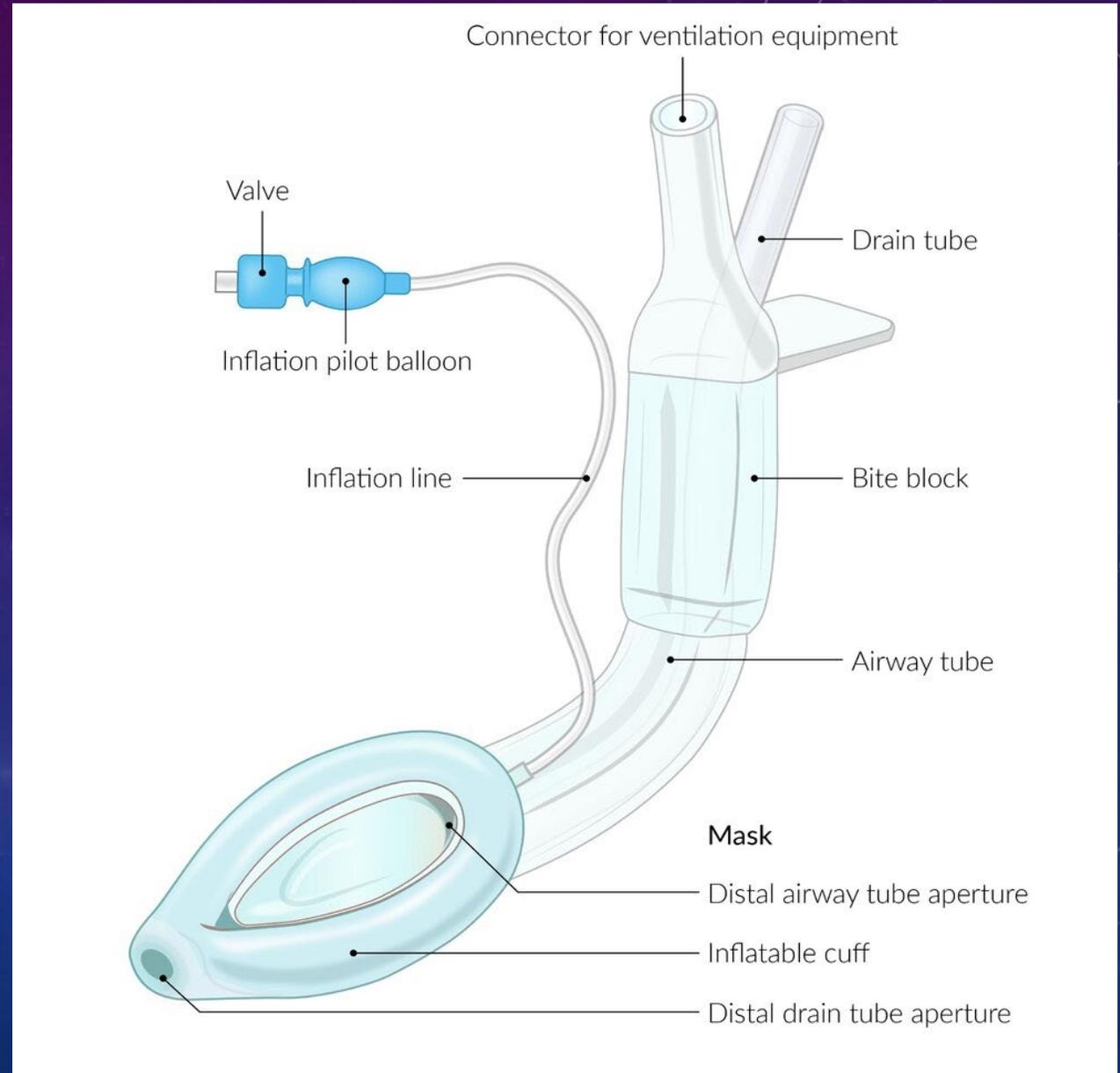
# CHOICE OF AIRWAY

- Supraglottic
- Laryngeal Mask Airway



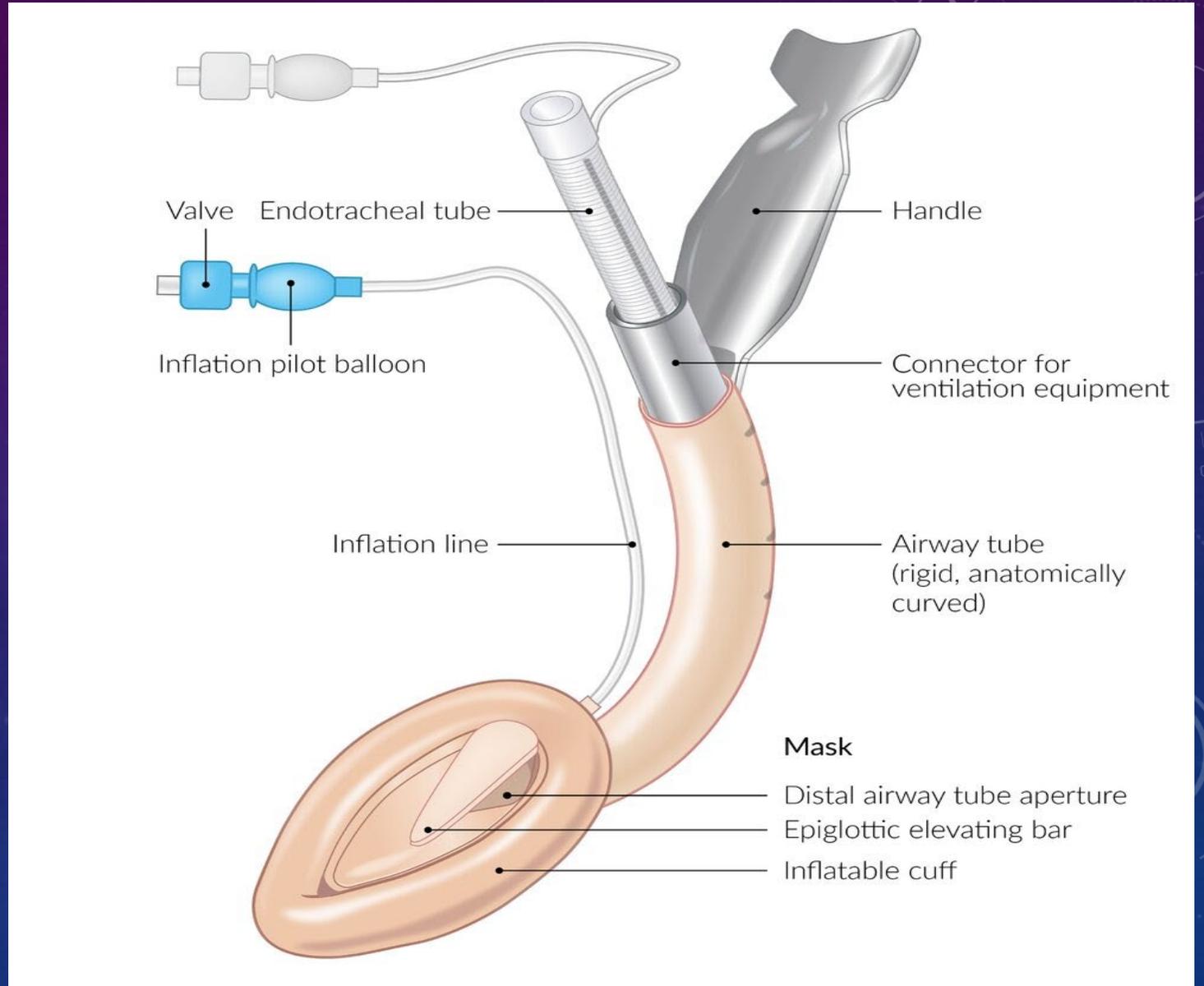
# CHOICE OF AIRWAY

- LMA continued...



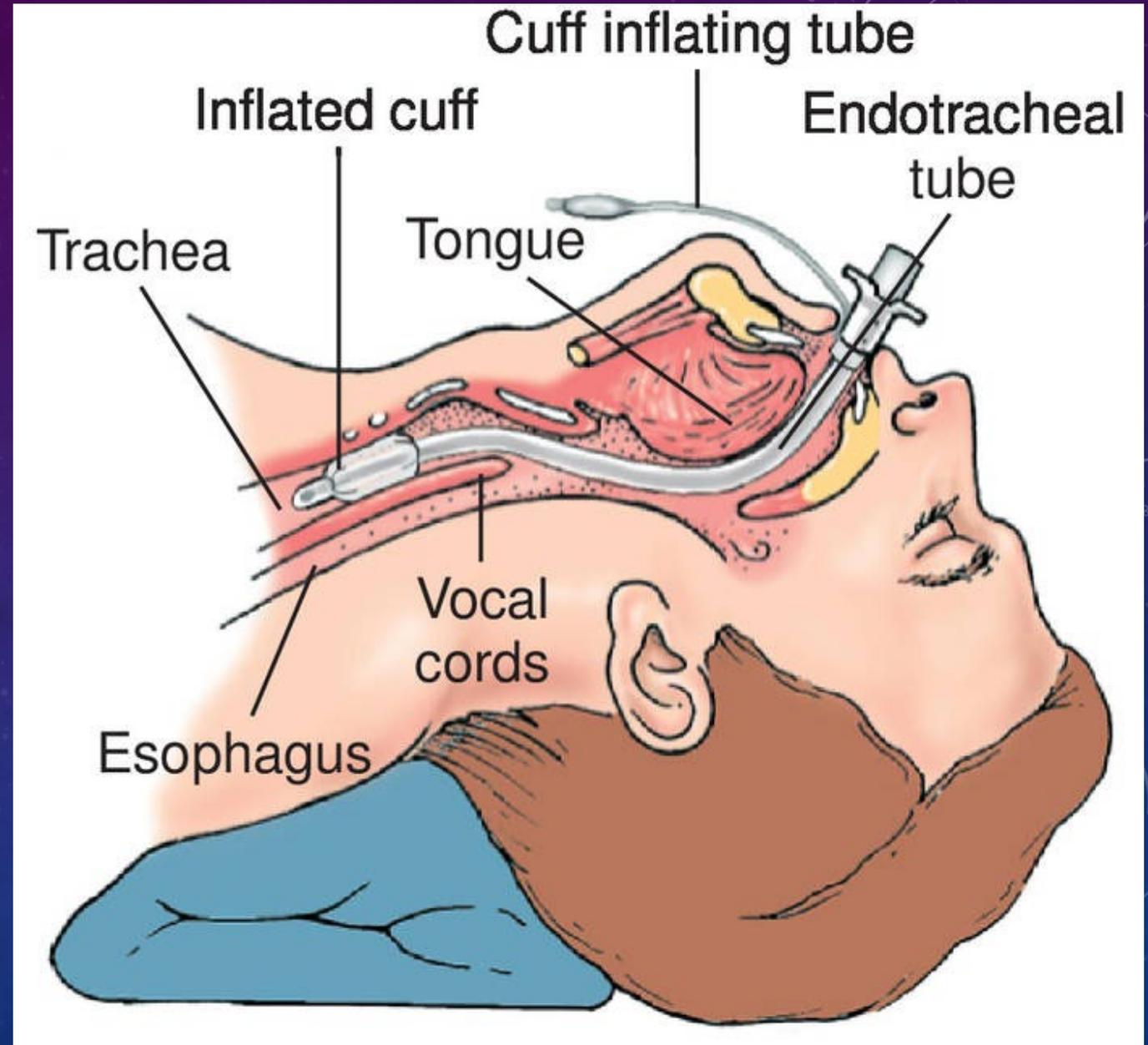
# CHOICE OF AIRWAY

- LMA Cont...



## CHOICE OF AIRWAY

- Subglottic
- Endotracheal Tube (ETT)

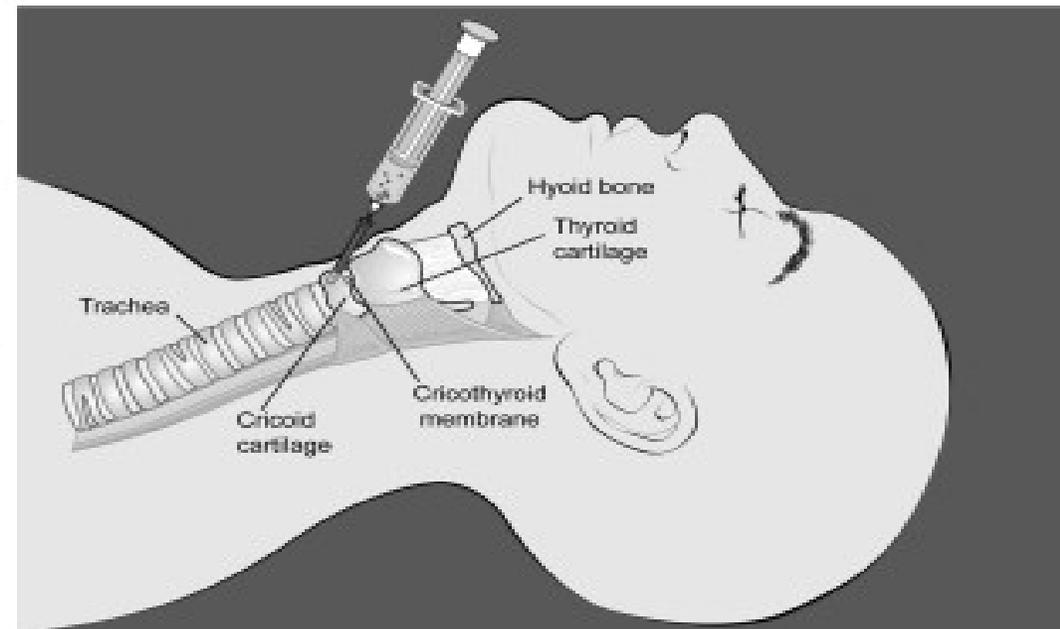
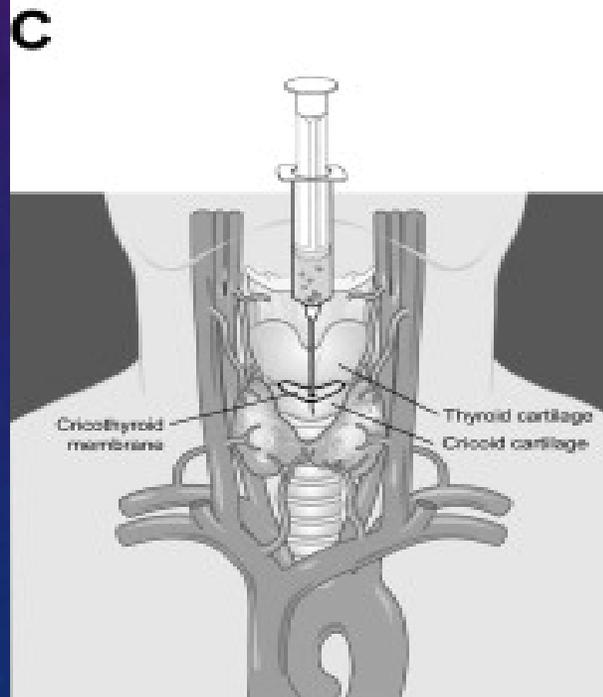
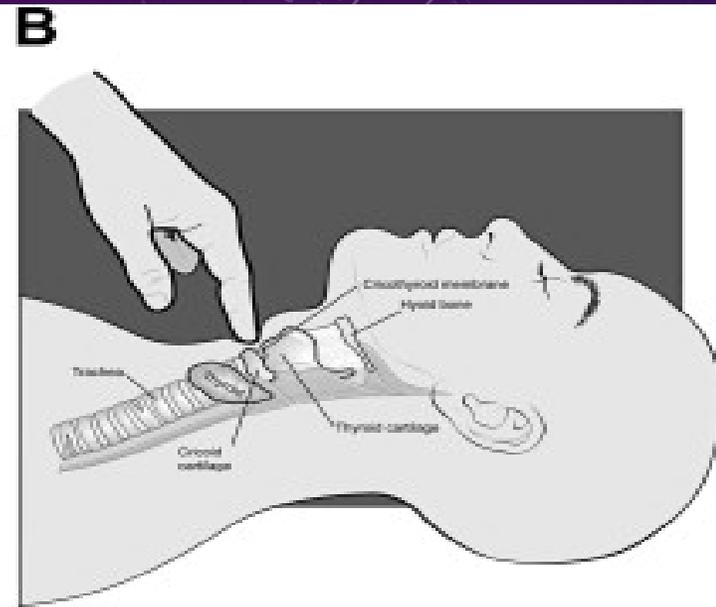
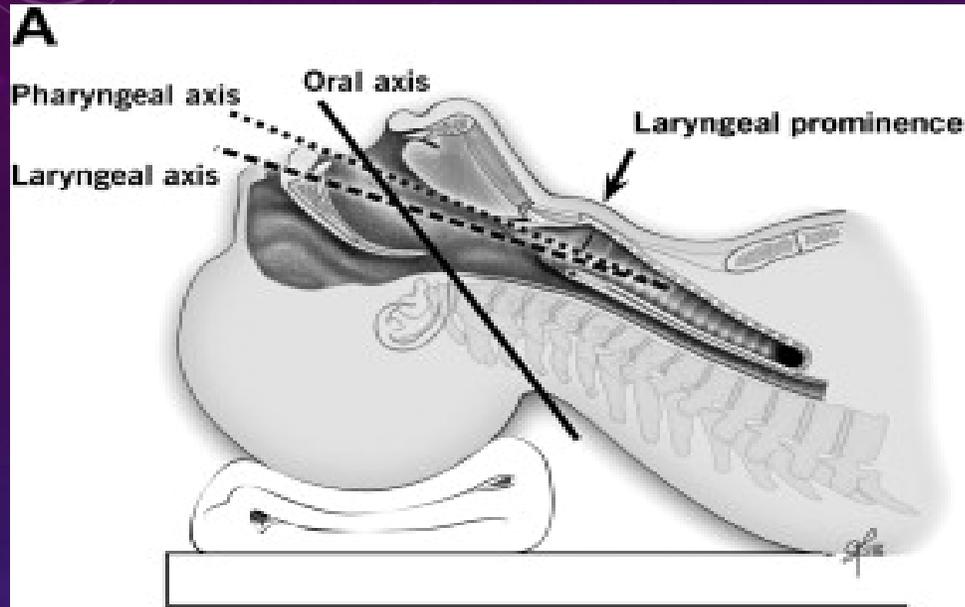


## CHOICE OF AIRWAY

- Pros: It's secure and amenable to higher pressure mechanical ventilation as well as other interventions (bronchoscopy, etc.)
- Cons: More difficult to place and potentially subjects patient to trauma and/or worsens preexisting trauma

# CHOICE OF AIRWAY

- Cricothyrotomy or other surgical airway

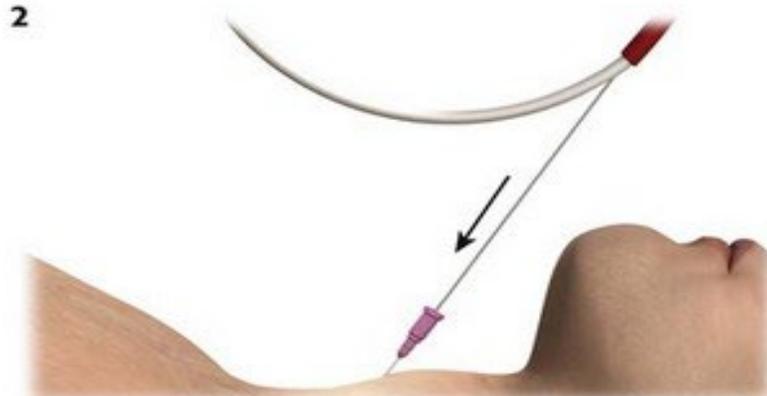


# SURGICAL/CRICOTHYROTOMY

## MELKER PERCUTANEOUS CRICOTHYROTOMY



**1** Palpate the cricothyroid membrane and advance the needle at a 45° angle in a caudal direction. Aspirate on the saline-filled syringe as you advance; air bubbles will enter the syringe when the trachea is entered.



**2** Advance the catheter over the needle and then remove the needle. Thread the guidewire through the catheter into the trachea. Once the guidewire is in place, remove the catheter.



**3** Make a small incision at the point of guidewire entry to facilitate passage of the dilator and airway catheter.



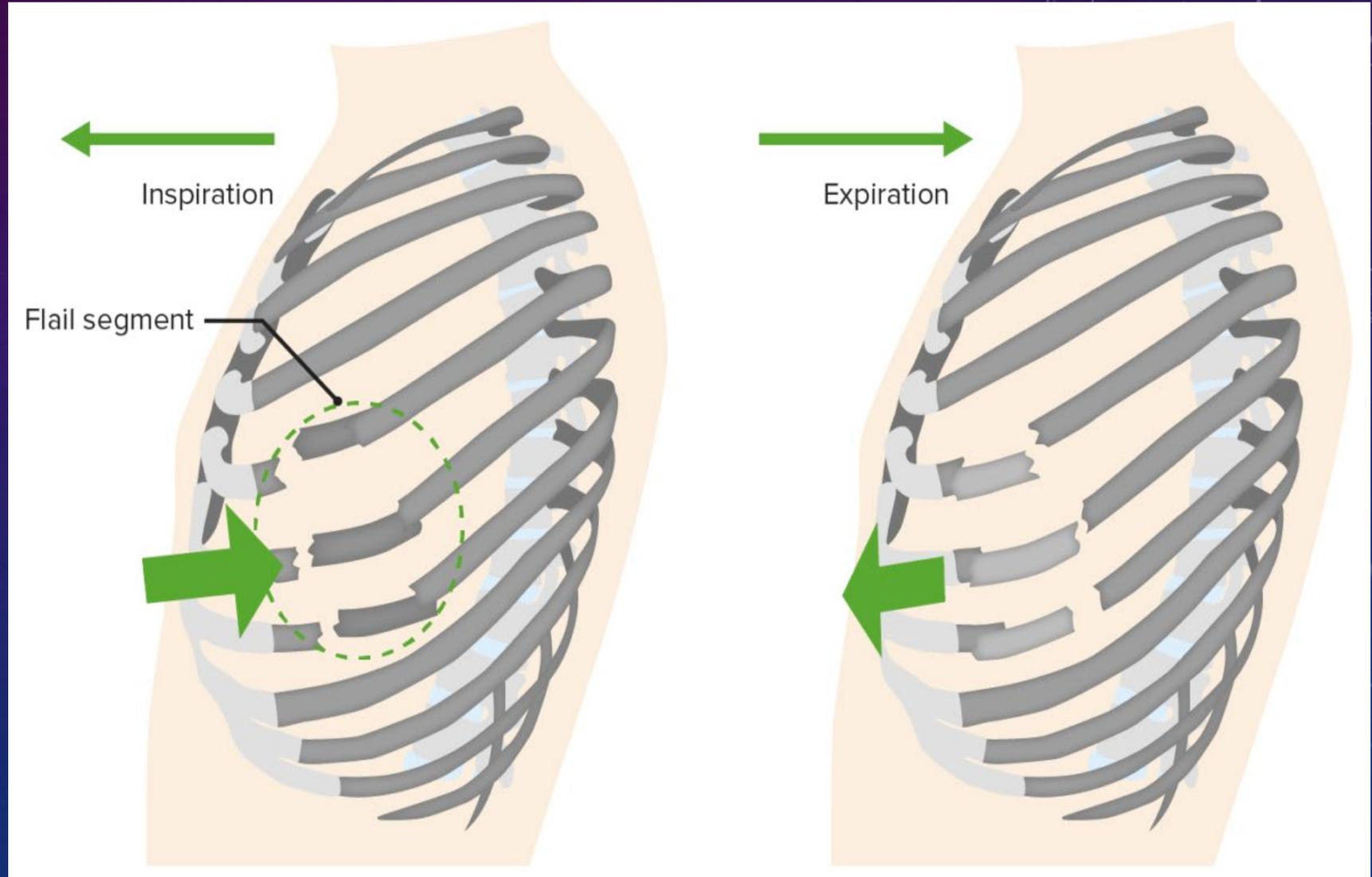
**4** Place the dilator into the airway catheter and thread them over the wire as a unit until it is flush with the skin. Remove the guidewire and dilator, confirm placement, and secure.

# VENTILATION STRATEGIES IN TRAUMA PATIENTS

- Lung and/or chest trauma (mechanical injuries?)
- Inhalation injury
- Neuro trauma (CNS)
- **KEY POINT: All can lead to Acute Respiratory Distress Syndrome (ARDS)**

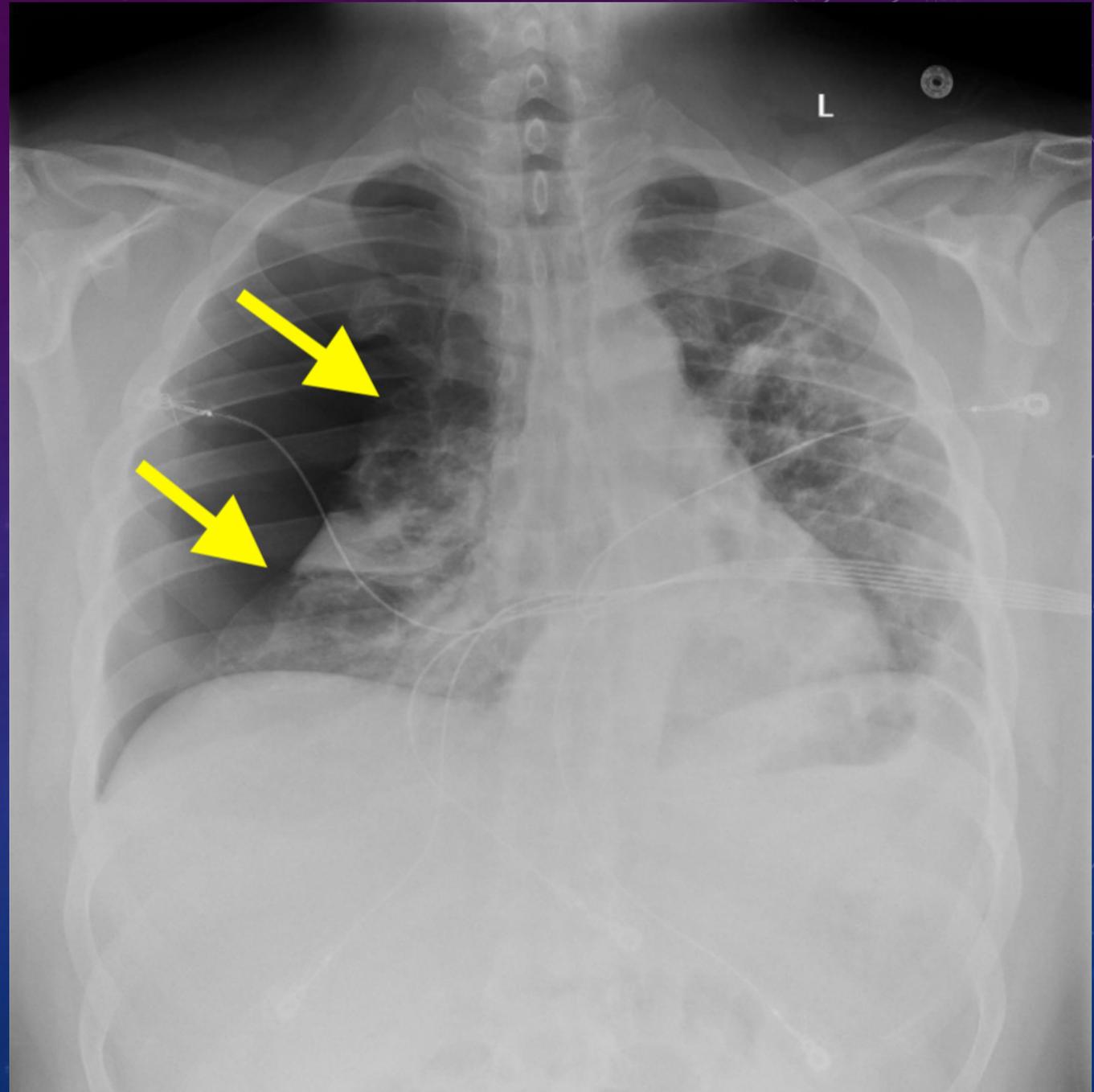
# CHEST TRAUMA-MECHANICAL

- Flail Chest
- High risk for...
- Pneumonia
- Excessive pain
- Further soft tissue trauma/pneumothorax



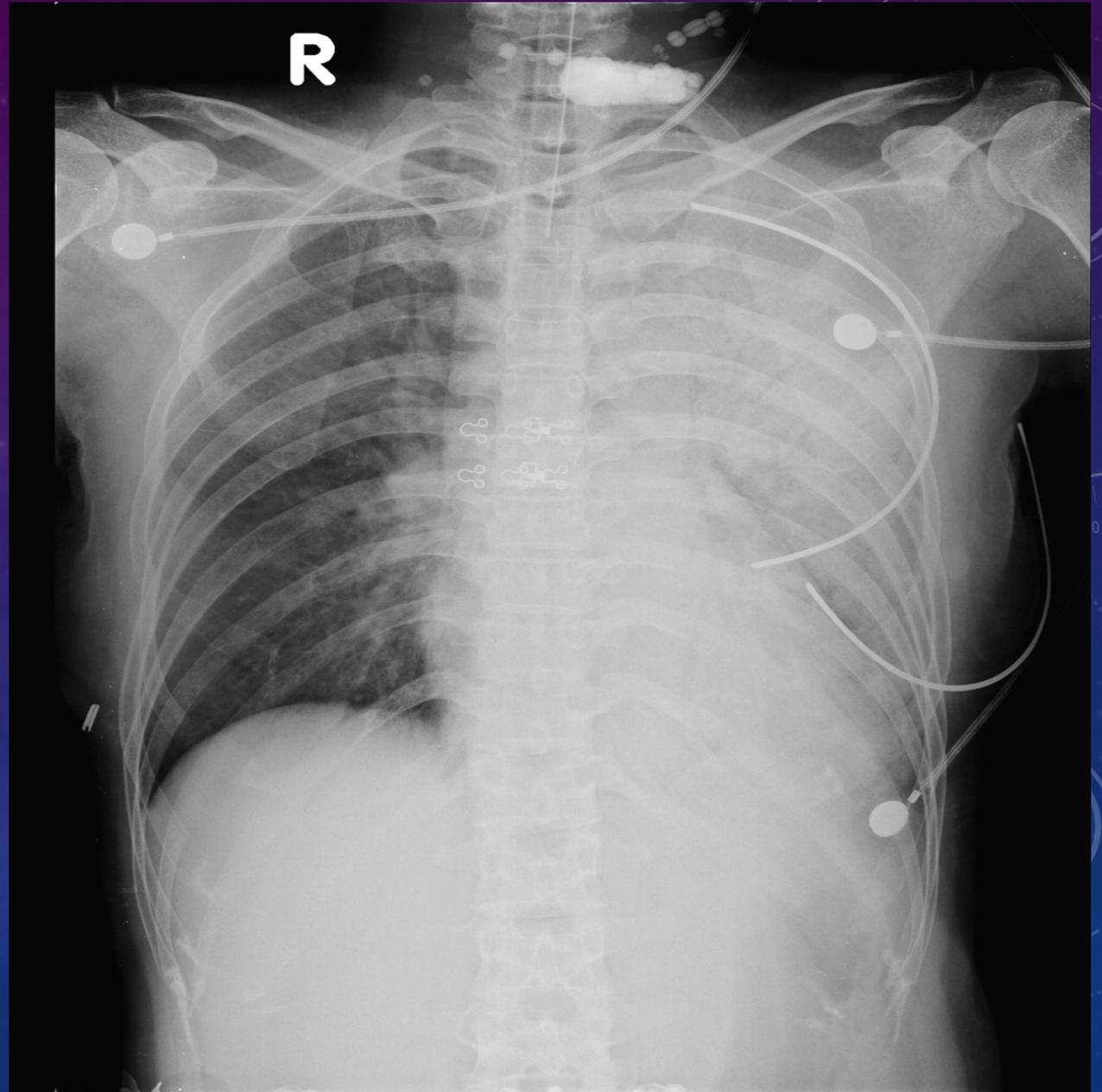
# MECHANICAL INJURY CONT.

- Pneumothorax
- High risk for both pulmonary and cardiovascular collapse
- Chest tube



## MECHANICAL INJURY CONT.

- Blunt force trauma w/o fracture
- Contusion/bruise injury resulting in ARDS
- Can manifest as both intra-alveolar and interstitial fluid accumulation



# INHALATIONAL INJURY

- Chemical: liquid or gas
- Drowning
- Results in severe inflammatory response leading to ARDS



# HEAD AND NEURO TRAUMA

- Airway and vent. management should focus on...
- Reduction in cervical stress and intracranial pressure
- CO2 reduction (**Different from standard ARDS ventilation**)
- Remember that severe neuro trauma can trigger ARDS

# ANESTHETIC CONSIDERATIONS IN TRAUMA PATIENTS

- General vs. Regional
- Advantages of General
- Advantages of Regional Anesthesia

# REGIONAL ANESTHESIA

- May include both neuraxial (spinal or epidural) vs. peripheral nerve blocks
- Obviously, these would primarily be considered in patients w/o pulmonary compromise (or very limited pulmonary compromise)

# REGIONAL ANESTHESIA

- Pitfalls may include...
- Further neuro/vascular damage at the site of injection
- Masking neuro damage
- Increased bleeding potential or hypotension due to vasodilation

# ADVANTAGES OF REGIONAL

- Outstanding pain control
- Minimal CNS involvement, less need for sedation
- Potentially far less need for airway or ventilation intervention
- Can often be highly selective/targeted

# ADVANTAGES OF GENERAL

- Highly selective ventilation control or strategies can be implemented/maintained
- Avoids non-CNS neuro "masking" (both patient benefit as well as medico-legal)
- Compared to neuraxial (spinal), can control hypotension more readily (shock)
- Unlike some regional anesthetics, general is usually not time-dependent

## CLINICAL BOTTOM LINE

- Airway management techniques are determined by the types and severity of injuries and trauma a patient incurs
- All airway management techniques can lead to Acute Respiratory Distress Syndrome (ARDS)
- Regional anesthesia should be considered for patients w/o (or very limited) pulmonary compromise

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QUESTIONS....

