SafeTec Training Services

Advanced Airway Management for the EMT-Basic

Developed With Assistance From

Objectives

- Review anatomy relevant to airway management
- Relate key differences in airway structures and how they influence successful bag mask ventilation (BMV)
- Describe the process of opening the airway and maintaining it
- Describe the indications, limitations, proper sizing, and contraindications of BLS airway adjuncts

Objectives

- Define the MOANS BMV assessment mnemonic
- Describe BURP and Sellick's Maneuver
- Describe proper BVM use including proper ventilatory rates, depth, and cadence
- Describe the RODS extraglottic device assessment mnemonic
- Describe indications, limitations, sizing, and contraindications of extraglottic airway devices

"***Airway management is the foundation on which the resuscitation process rests.***"

- Ron Walls, MD

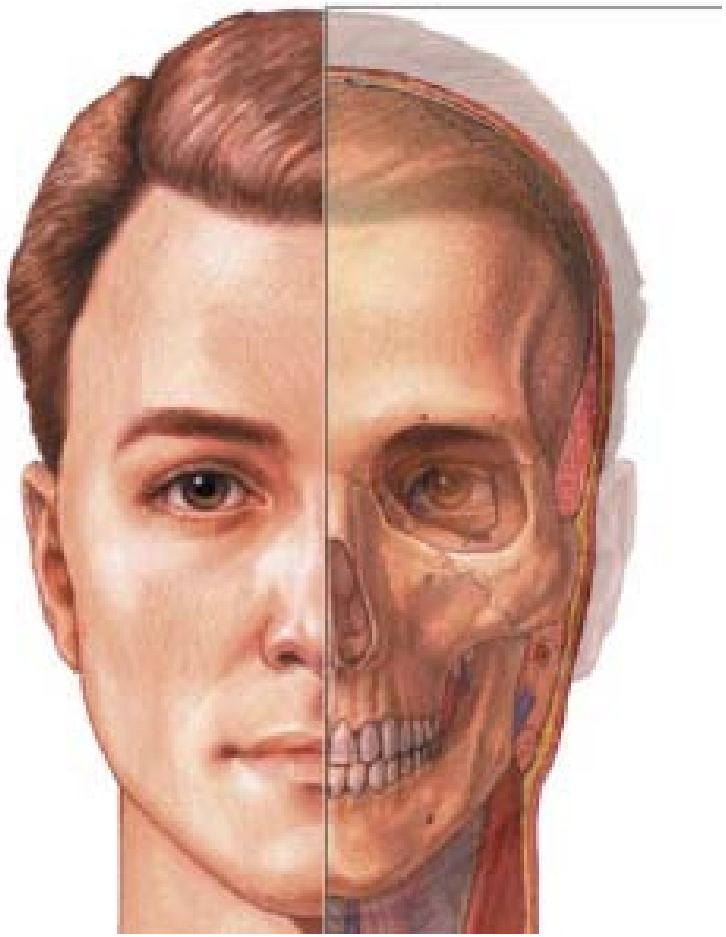
"There are few more important tasks in emergency medicine than airway management. Whatever method is used must be effective, for the problem airway does not allow the luxury of waiting until the "physician" arrives, or until the problem has cured itself."

- Charles E. Stewart, MD, FACEP

Airway Anatomy Affecting BMV

- Facial structures
  - Nasal bones
  - Maxilla
  - Mandible
  - Teeth
- Upper Airway structures
  - Tongue
  - Epiglottis
- Lower airway structures
  - Trachea
  - Bronchi
  - Lungs

Airway Anatomy Affecting BMV



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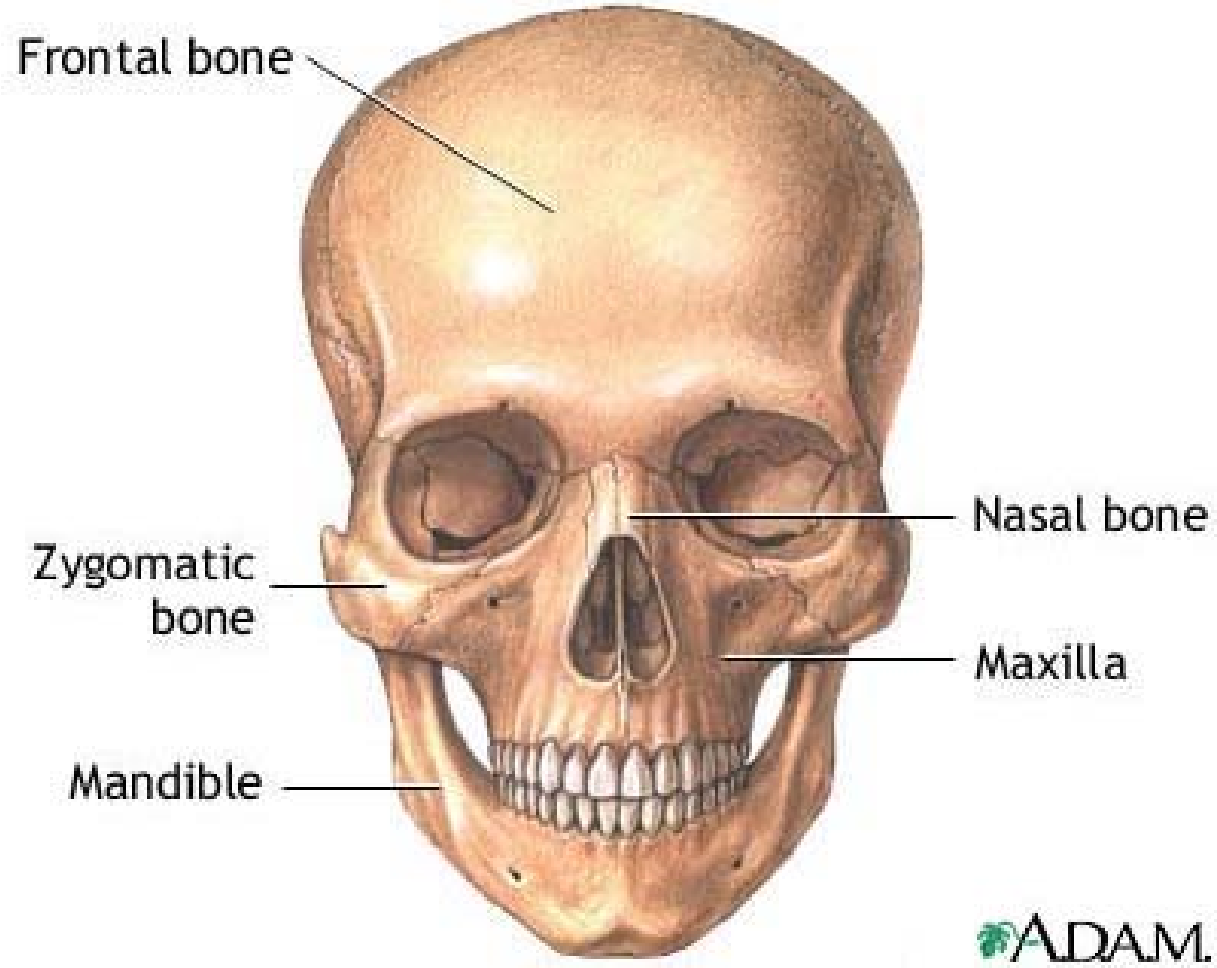

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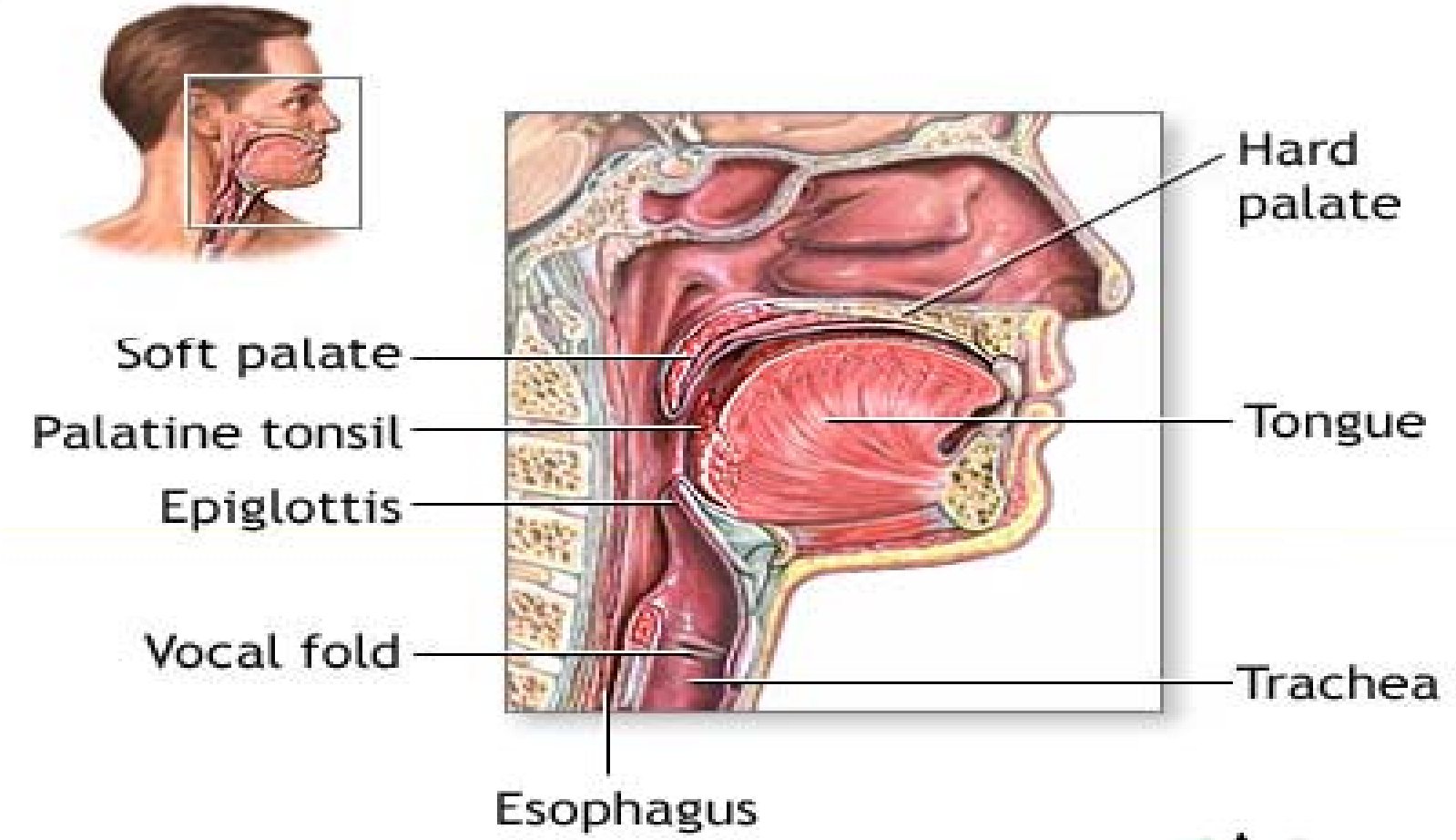

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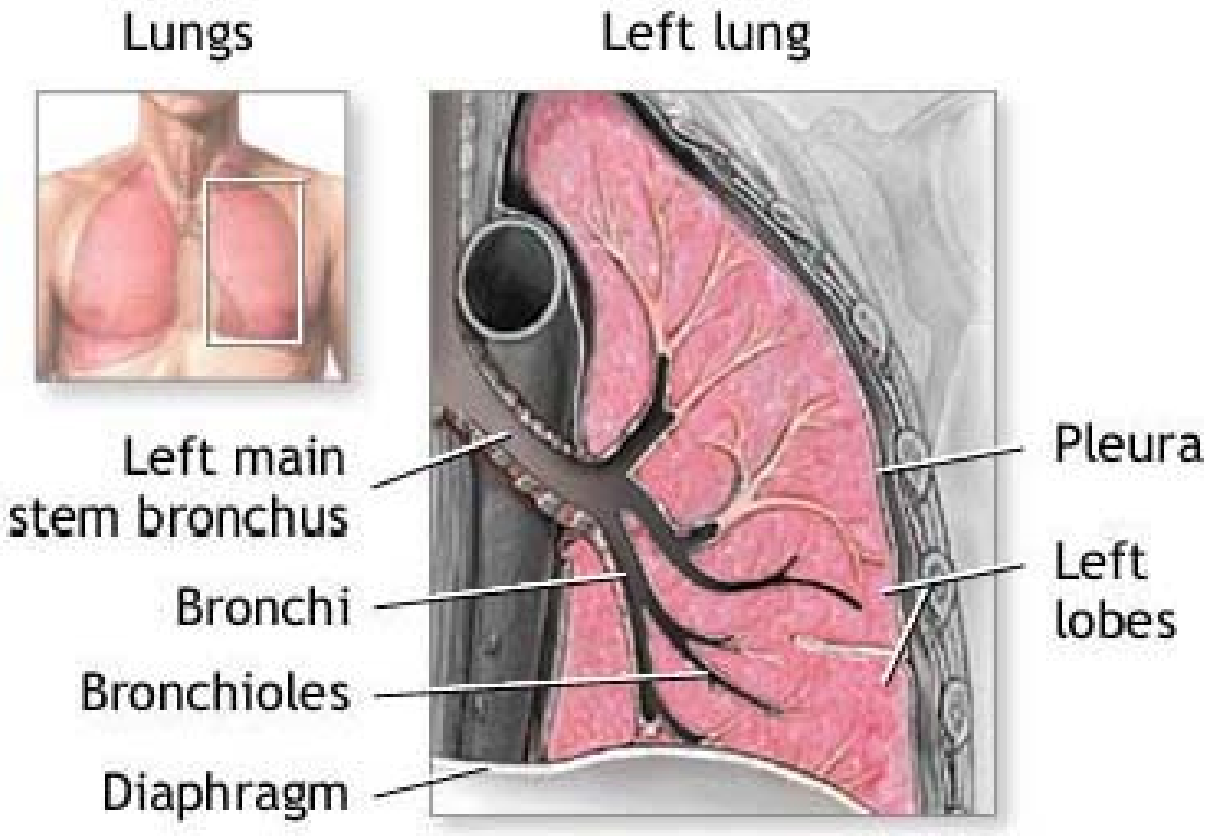


Predicting Difficult BMV

MOANS

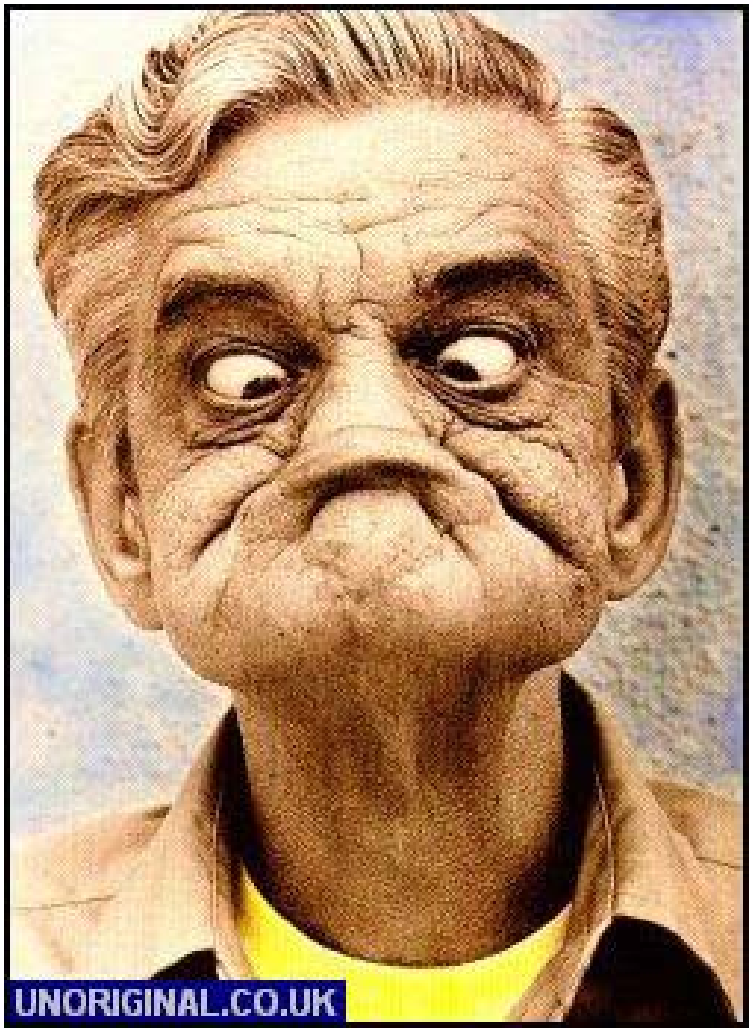
- **M**ask Seal
- **O**besity
- **A**ged
- **N**o Teeth
- **S**tiff Lungs

Mask Seal

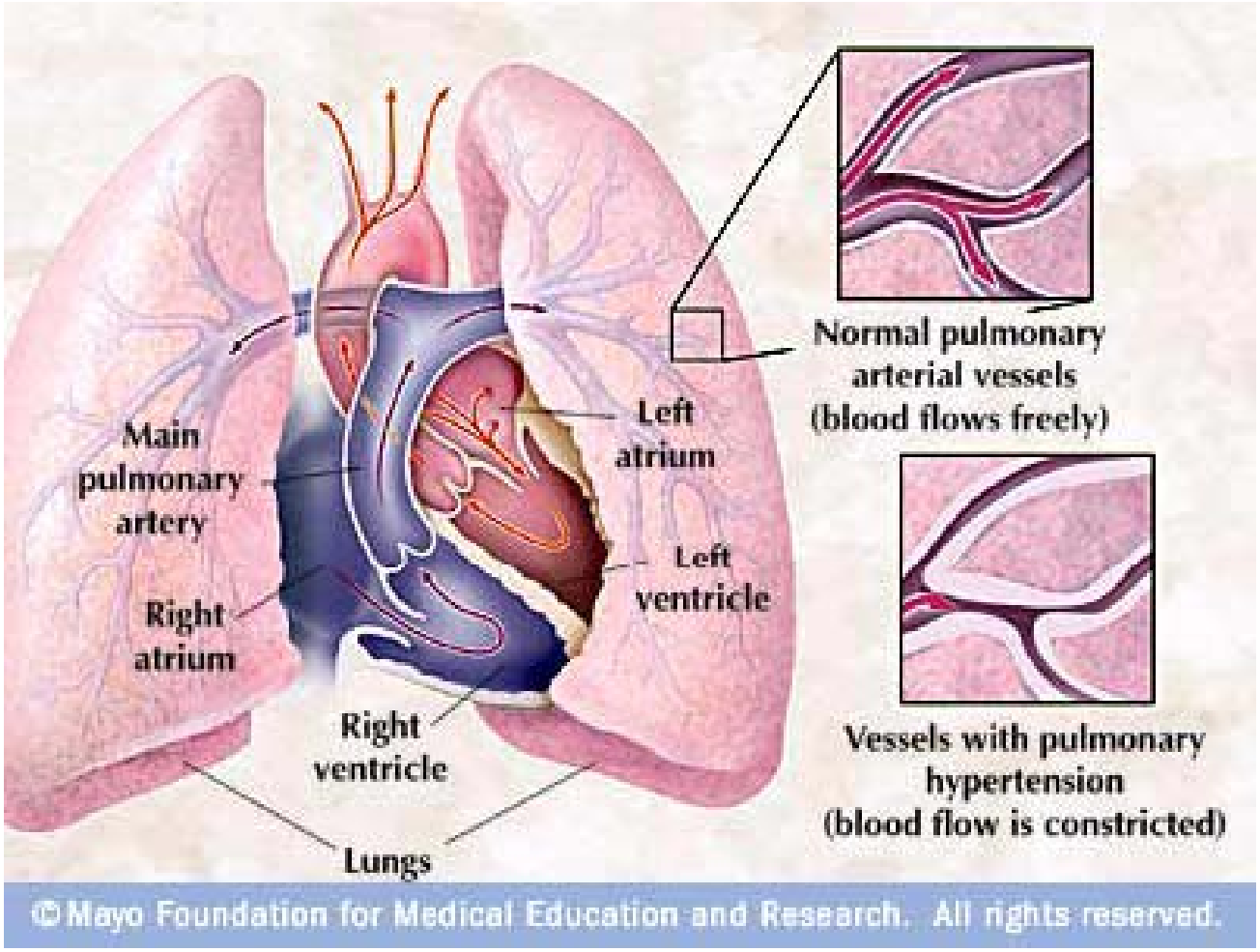
Obesity

Aged

No Teeth



Stiff Lungs

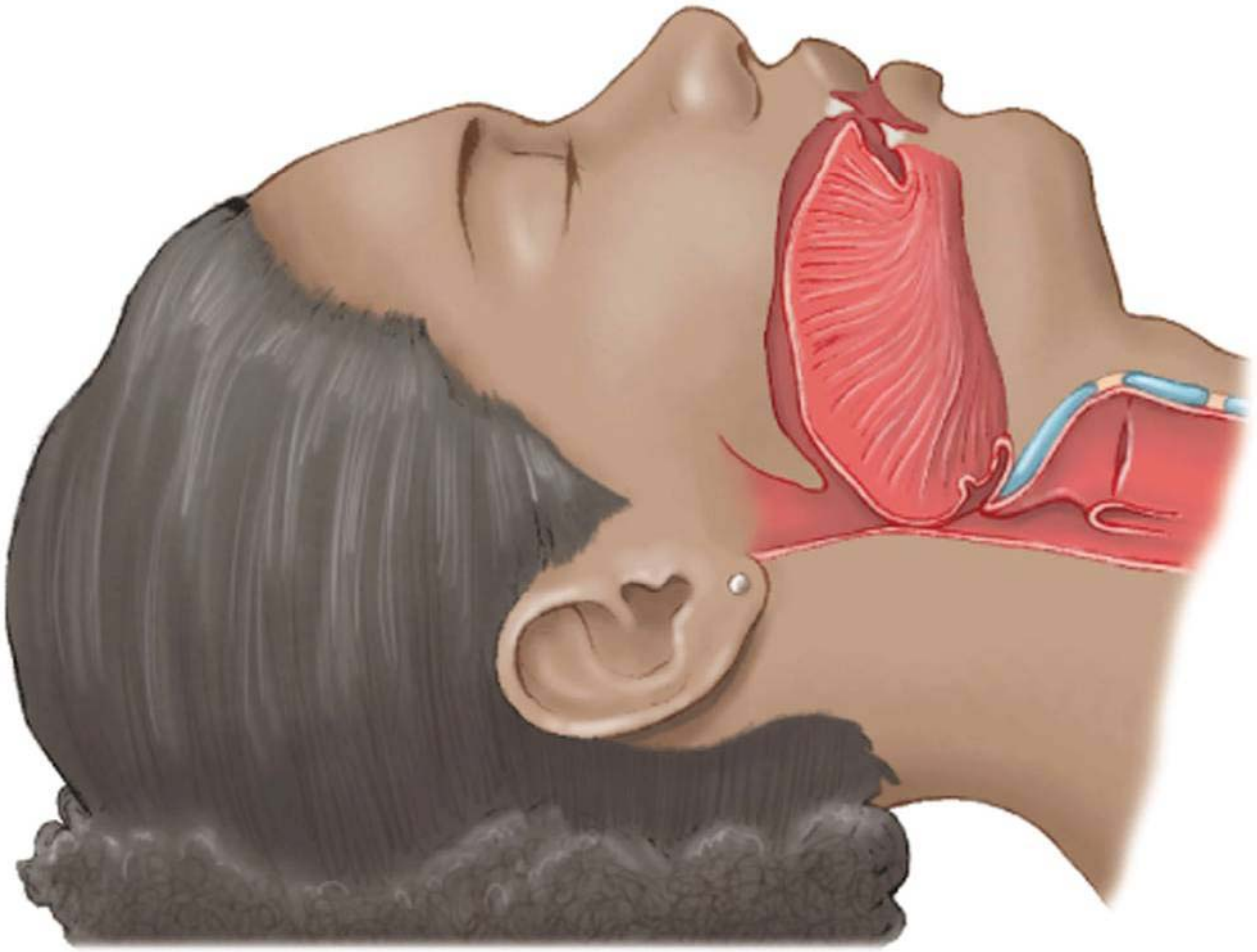


BMV Technique

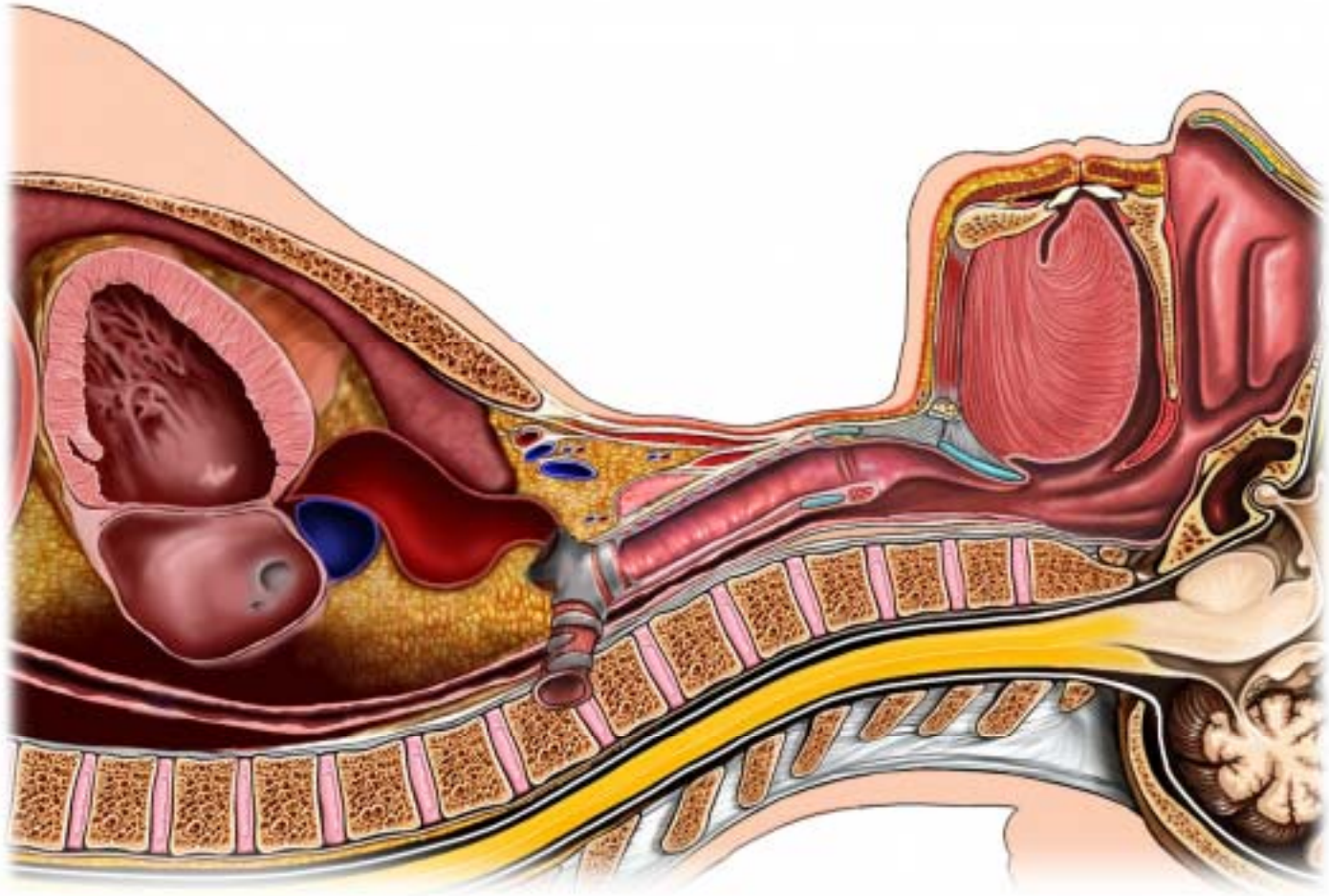
Two Points

- Open the airway
  - Keep it open!
  - Basic adjuncts
- Good mask seal

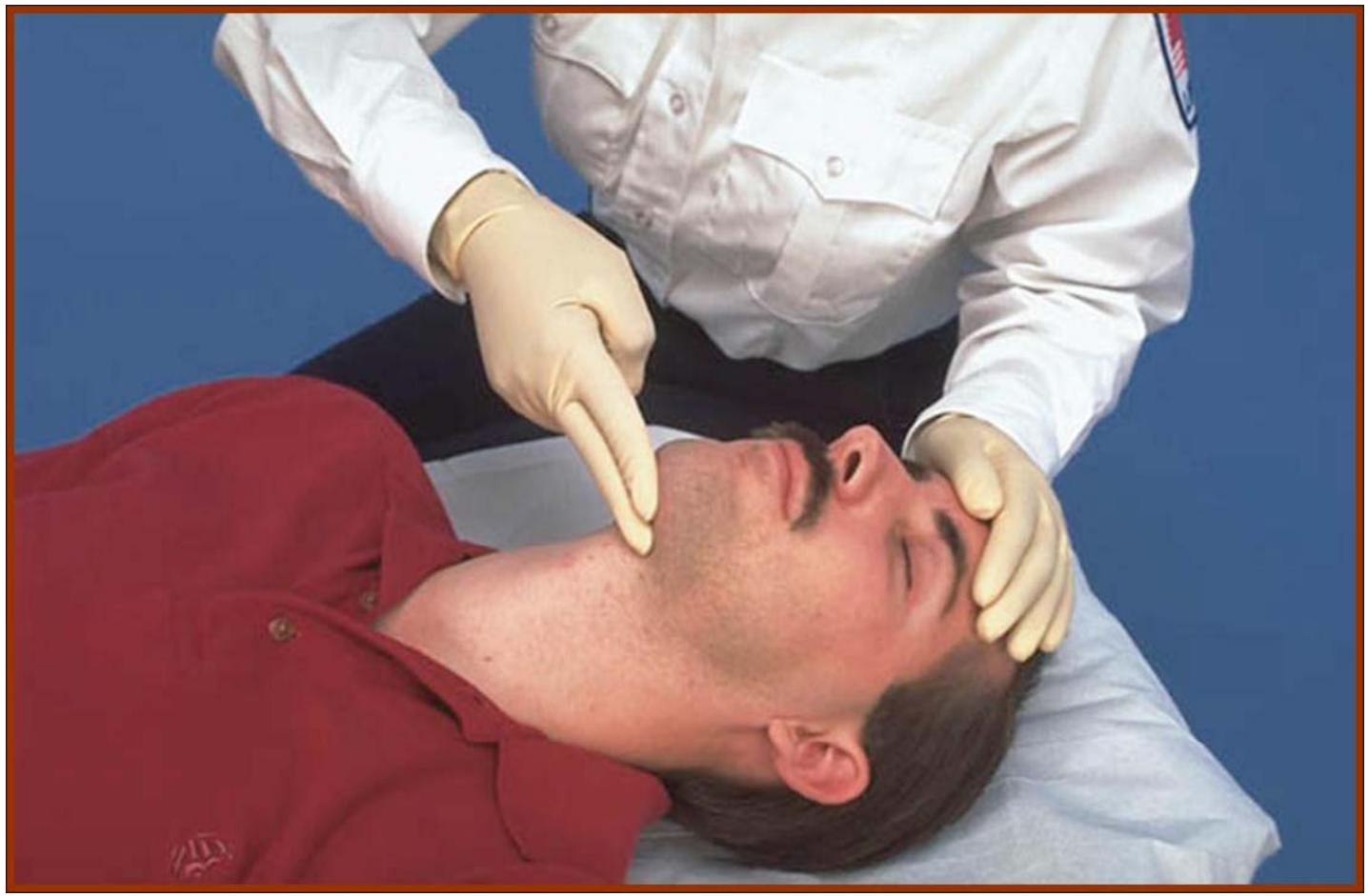
BMV Technique



BMV Technique



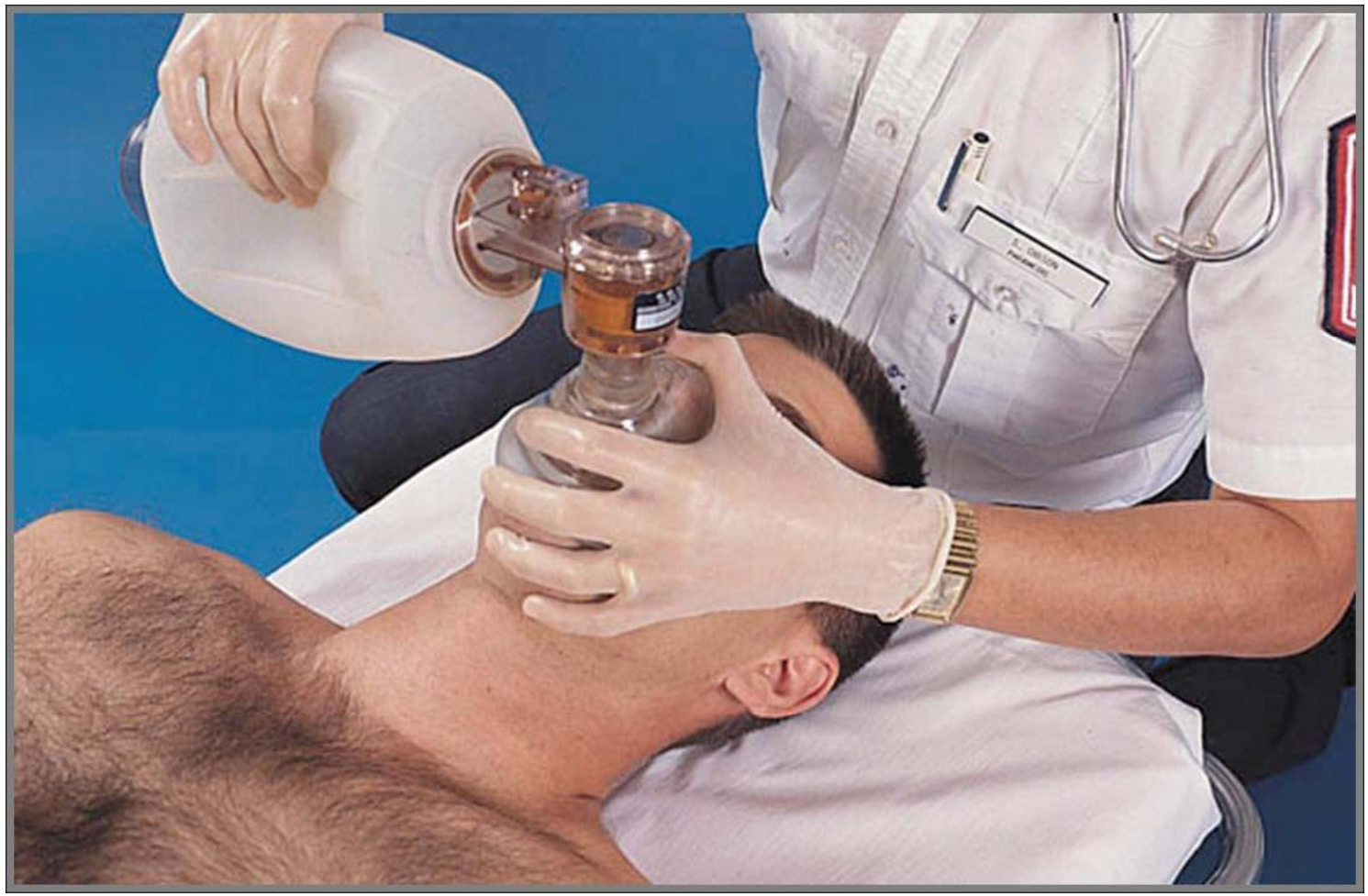
BMV Technique



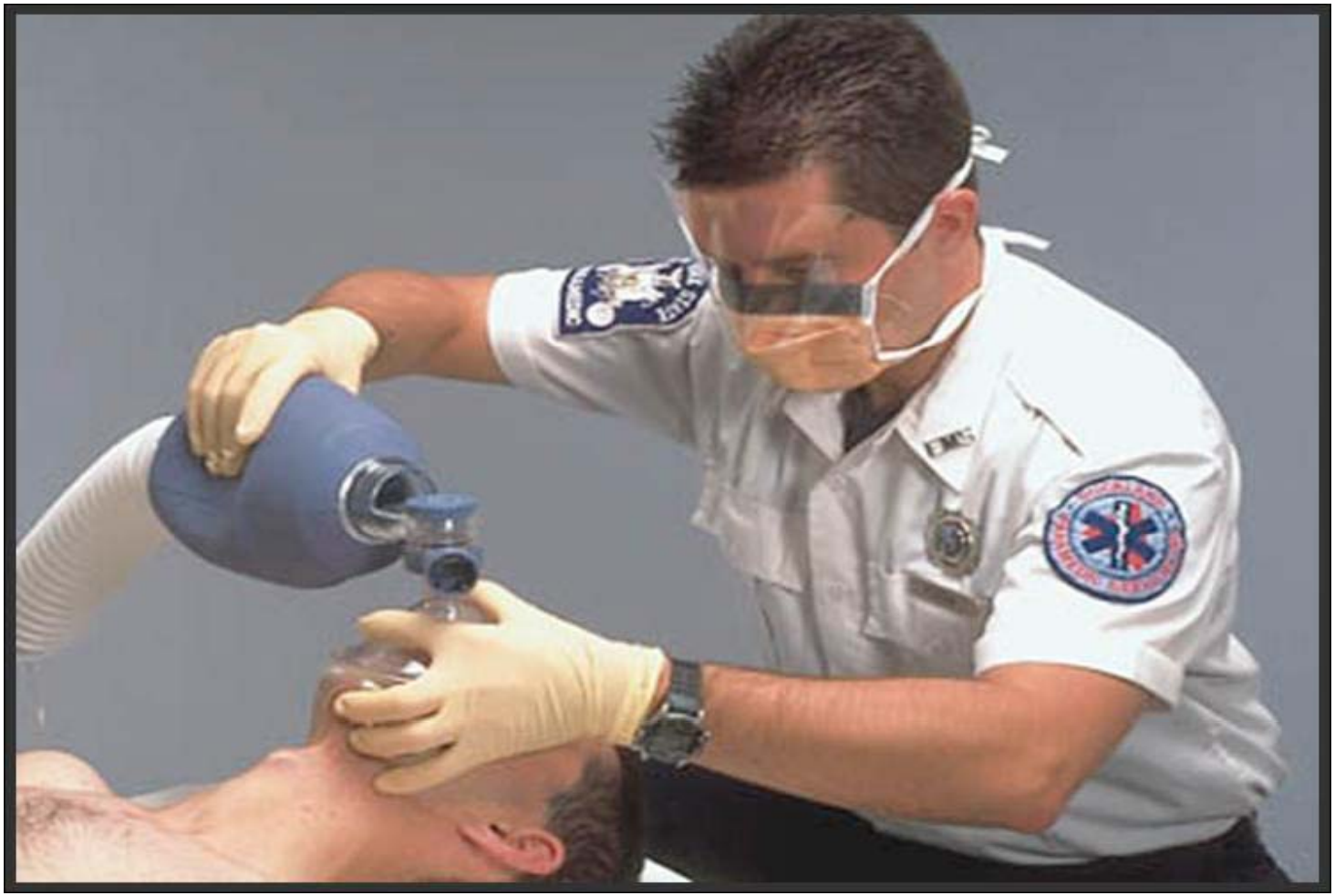
Head Tilt Chin Lift

BMV Technique

BMV Technique



BMV Technique



BMV Technique

Key BMV Points

- Maintain an open airway by practicing good technique
- Pull the mandible into the mask – do not push the mask into the mandible
- Avoid providing high pressure during ventilations
  - Longer inspiratory times (slow ventilations)
  - Smaller tidal volumes
  - Optimal airway opening

BMV Technique

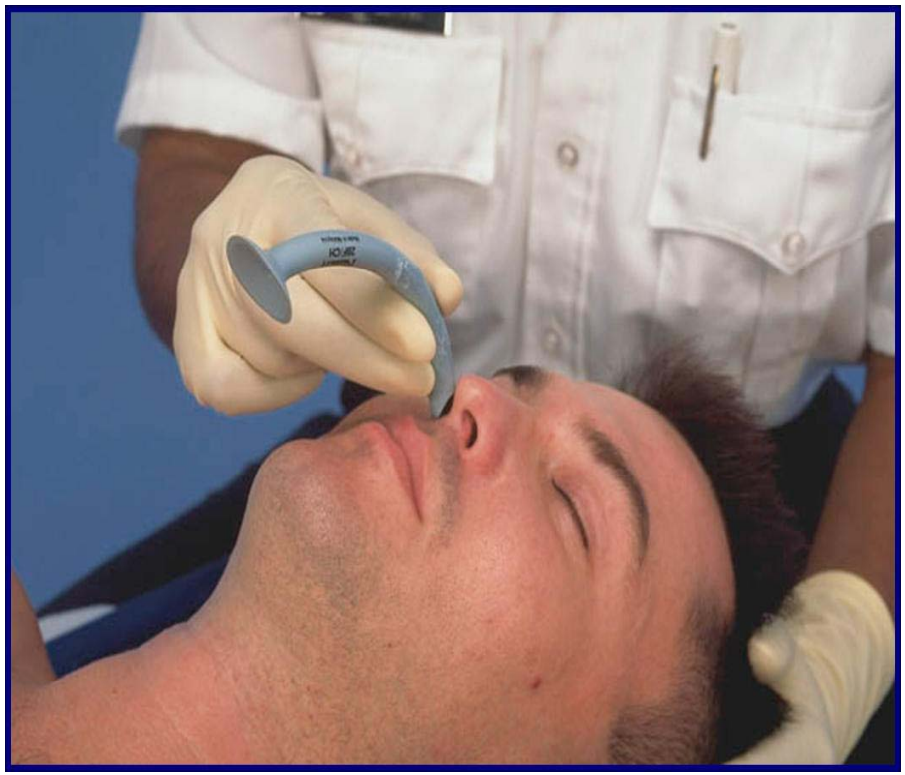
Key BMV Points

- Provide ventilations at a proper rate and cadence
  - **"squeeze, release, release"**
- Use one-handed technique over squeezing the bag against your body
  - Recommended TV = 500ml
- Use a basic airway adjunct
- **Don't forget the O's!!**

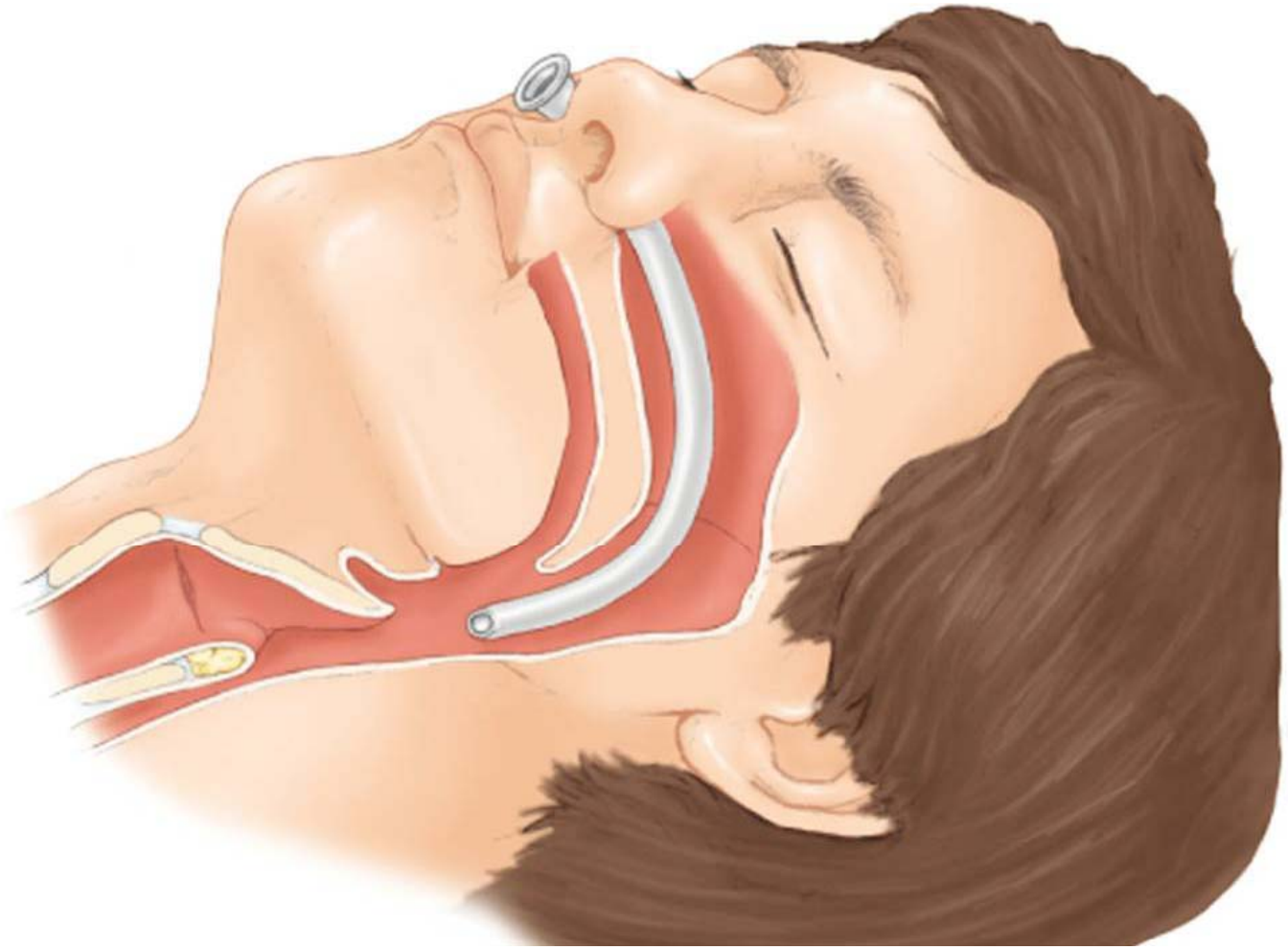
Basic Airway Adjuncts

NPA Key Points

- Must be properly sized
- Does not intubate the trachea
- May cause septum trauma
- May induce a gag reflex
- Relatively contraindicated in the head injured patient
  - Risk vs. Benefit



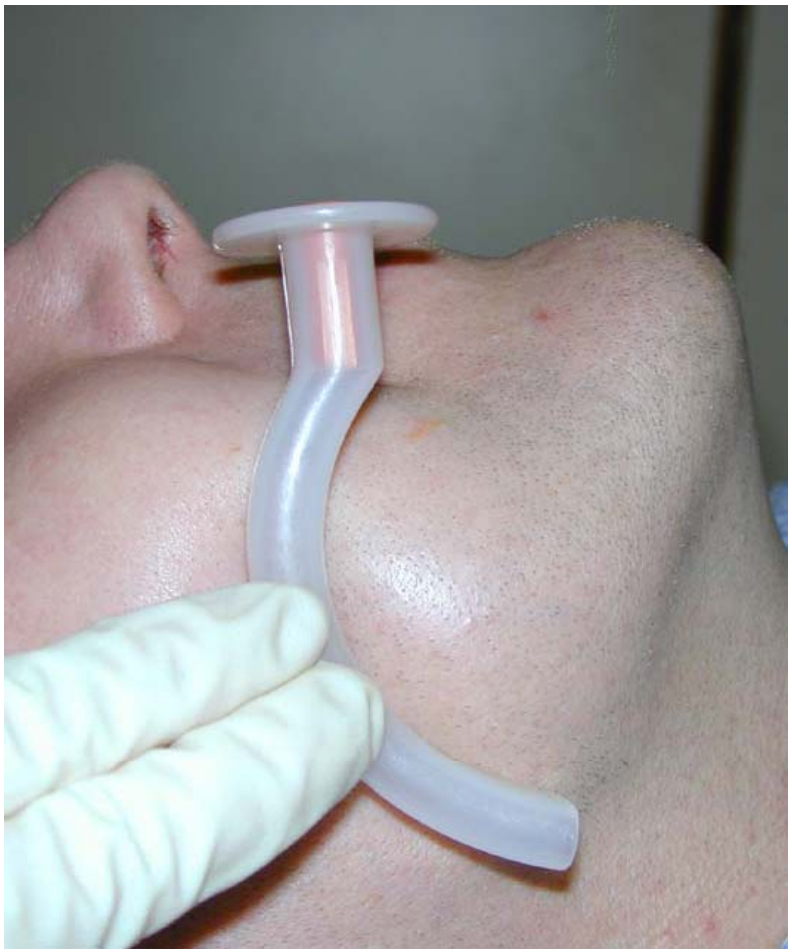
Basic Airway Adjuncts



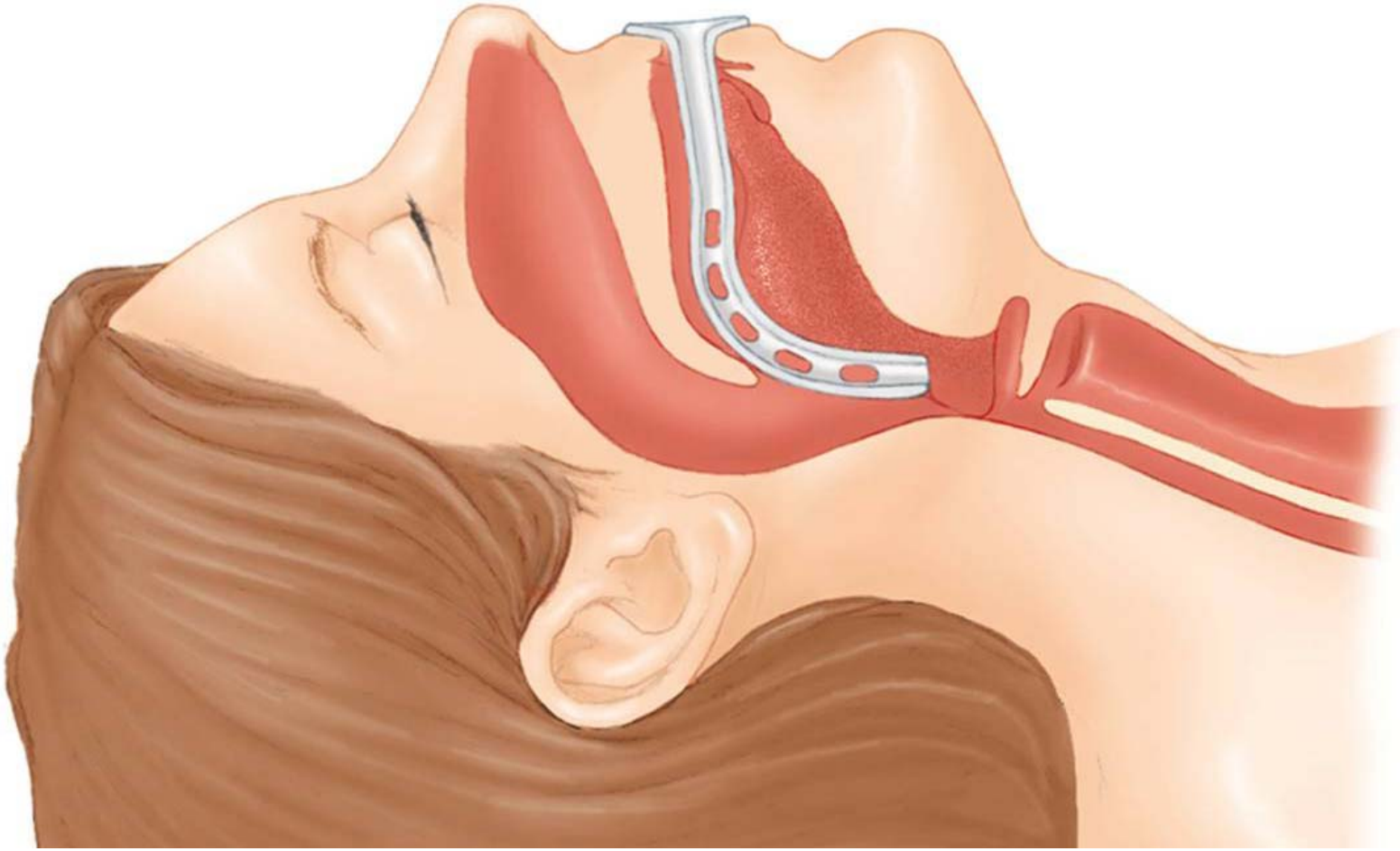
Basic Airway Adjuncts

OPA Key Points

- Must be properly sized
- Does not intubate the trachea
- May cause oral trauma
- Contraindicated in the patient with an intact gag reflex



Basic Airway Adjuncts

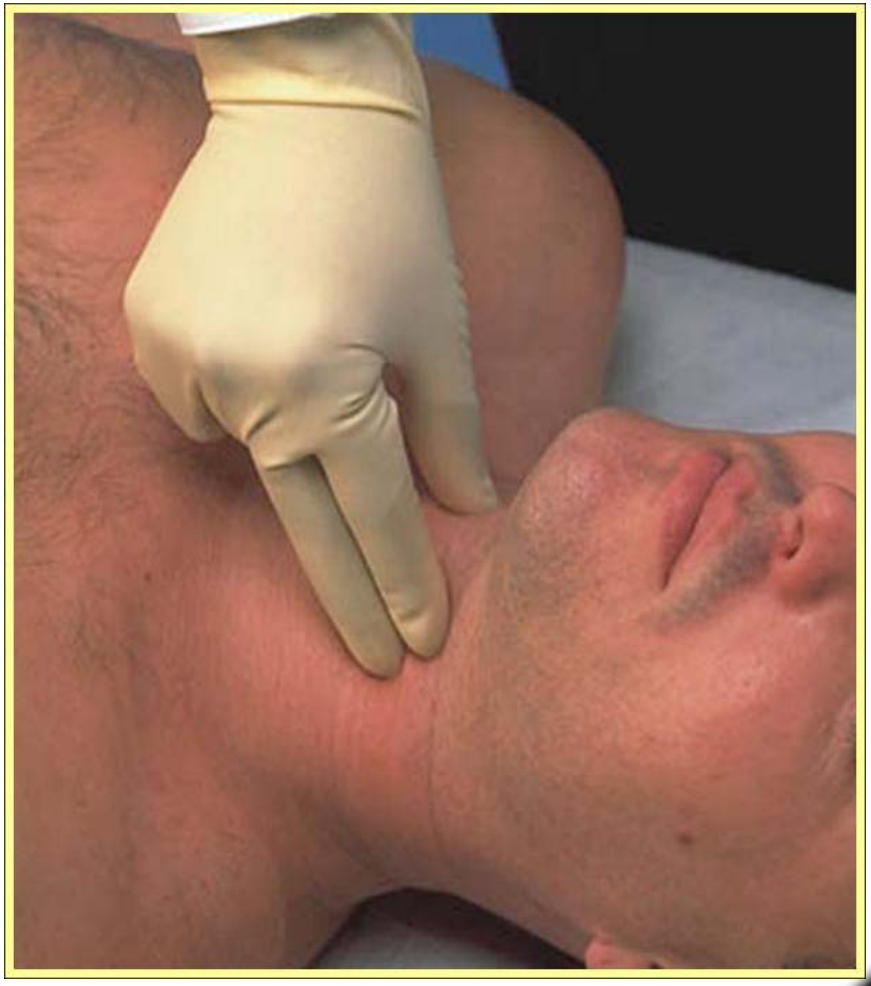


Basic Airways Insertion

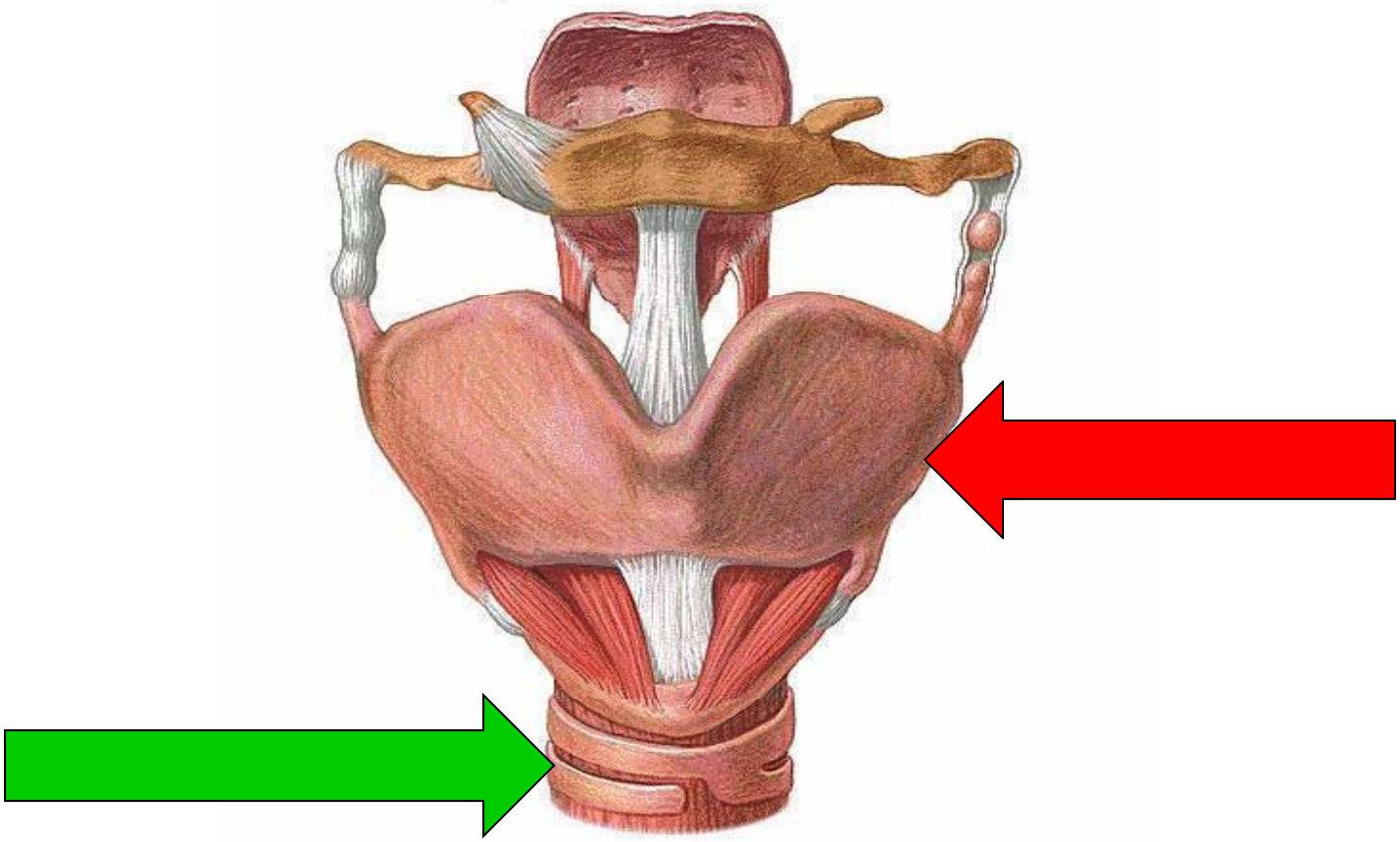
Sellick's Maneuver

Key Points

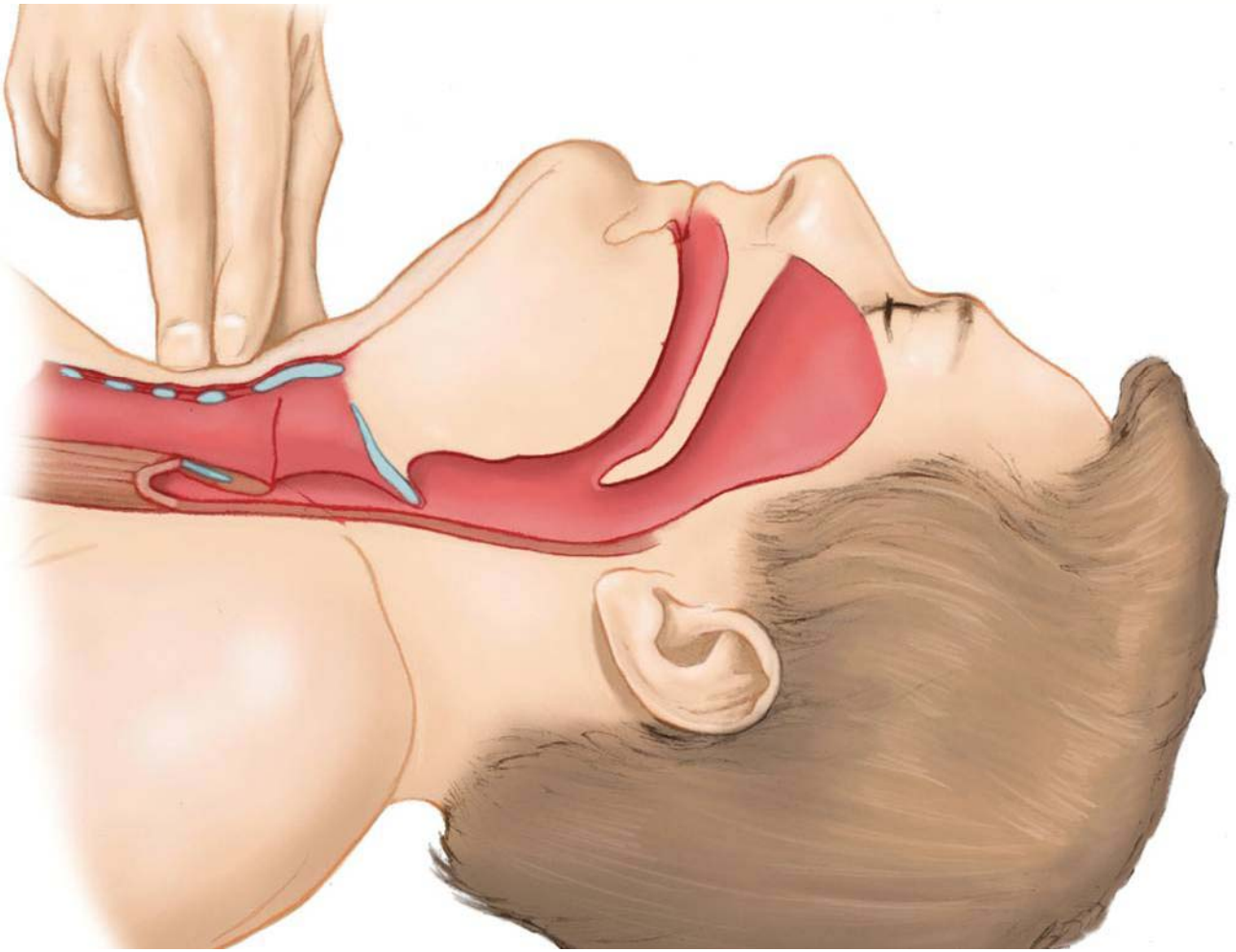
- Data both supports and questions its efficacy
- May reduce gastric insufflation during low to moderate BMV
- May impair ventilation by partially obstructing the upper airway
- May obscure glottic visualization during intubation



Sellick's Manuever



Sellick's Maneuver



BURP Technique

BURP Key Points

- **B**ackward, **U**pward, **R**ightward, **P**ressure
- May aid the provider during intubation
- **Is NOT Sellick's**

BURP

“PEEP Show” - Still With Me??

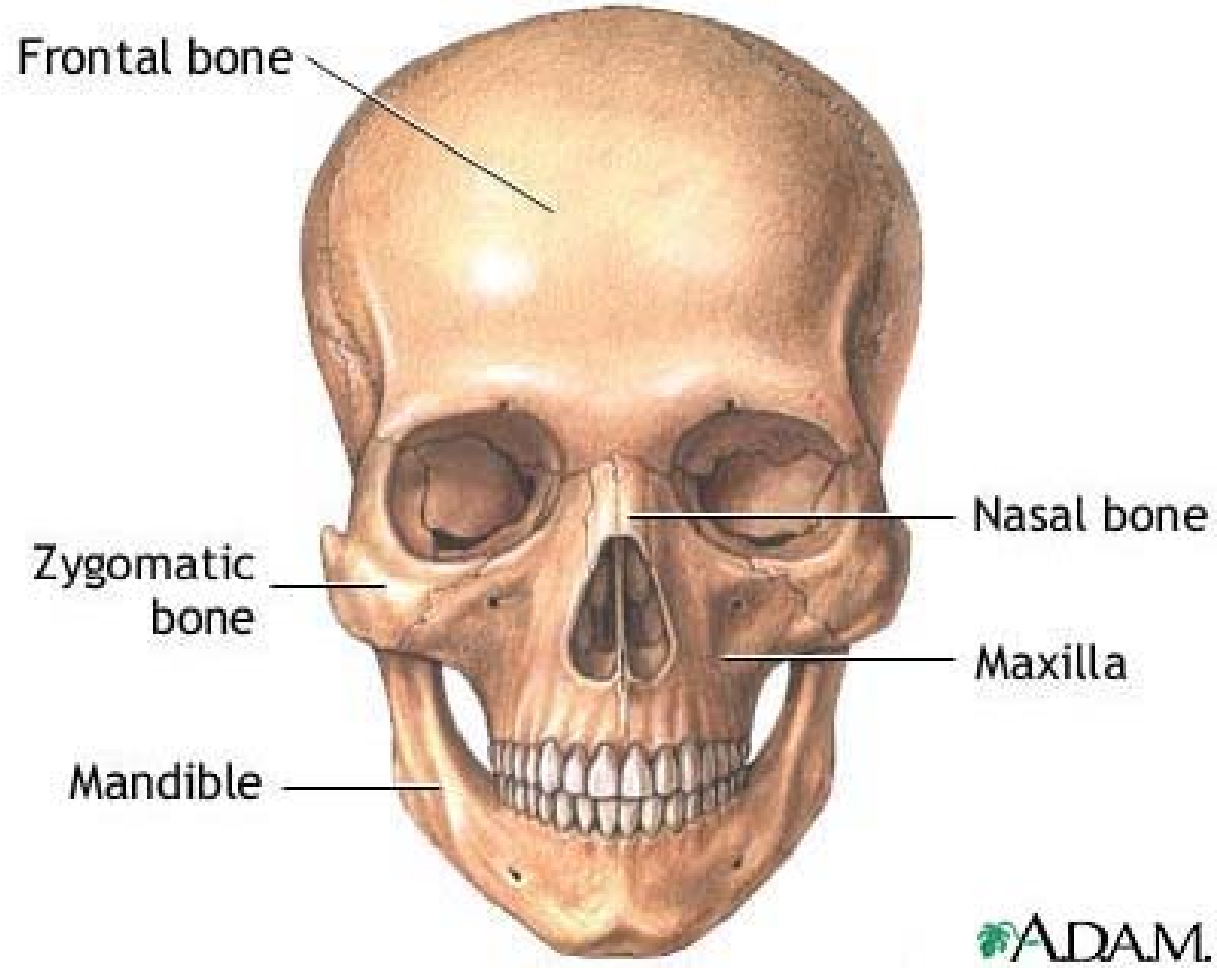
Extraglottic Devices

- Devices that sit “outside” of the glottis
  - Supraglottic
  - Infraglottic
- Used as “rescue” airway devices
- Used as a single attempt device in know difficult airway or confined space situations
- Do not intubate the trachea
  - **Esophageal Tracheal Combitube**
- Becoming popular over BMV for EMT’s secondary to ease of insertion, success rates, and ventilatory compliance

Airway Anatomy Affecting EGD's

- Facial structures
  - Maxilla
  - Mandible
- Upper Airway structures
  - Tongue
  - Epiglottis
- Lower airway structures
  - Trachea
  - Bronchi
  - Lungs

Airway Anatomy Affecting EGD's



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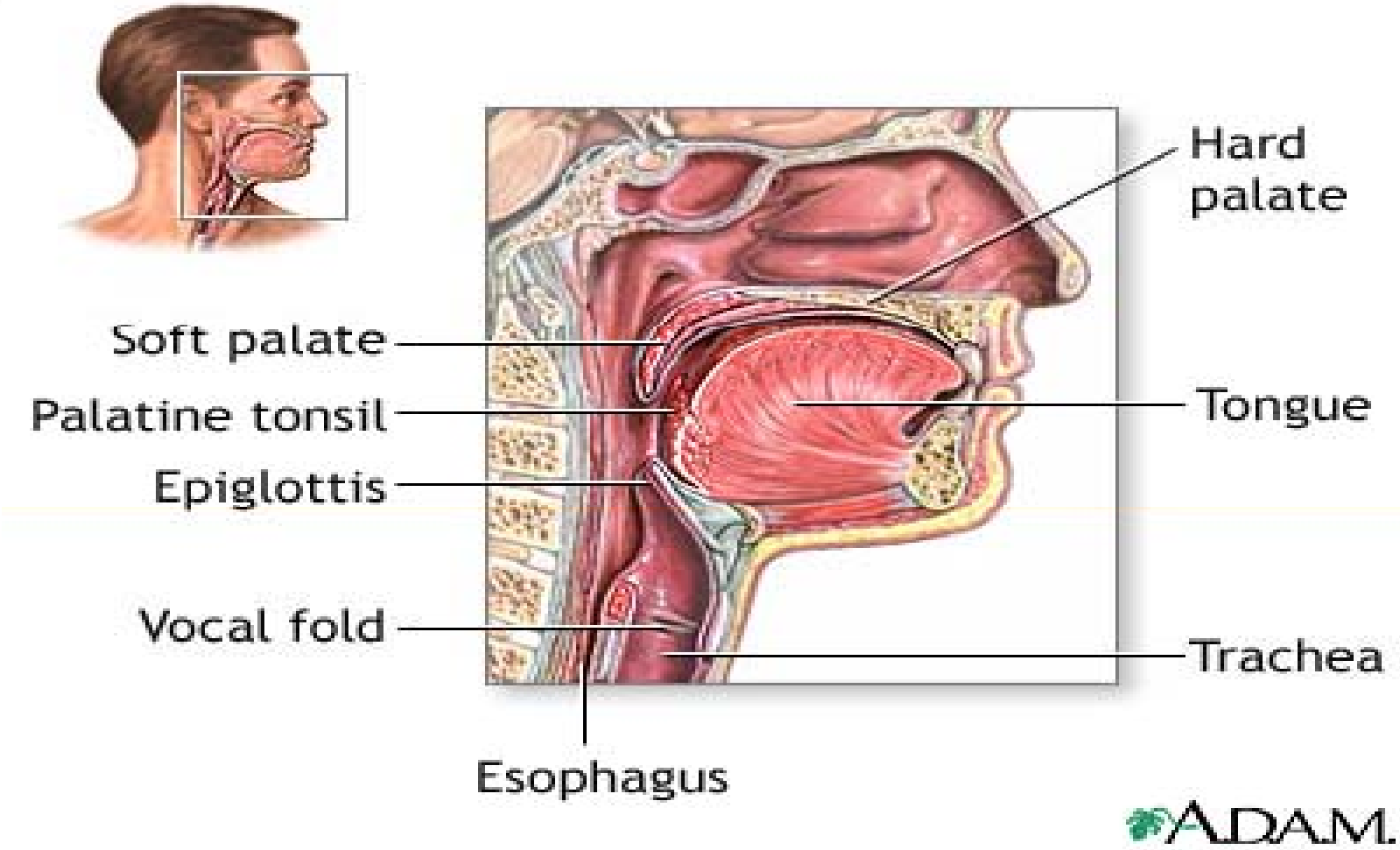

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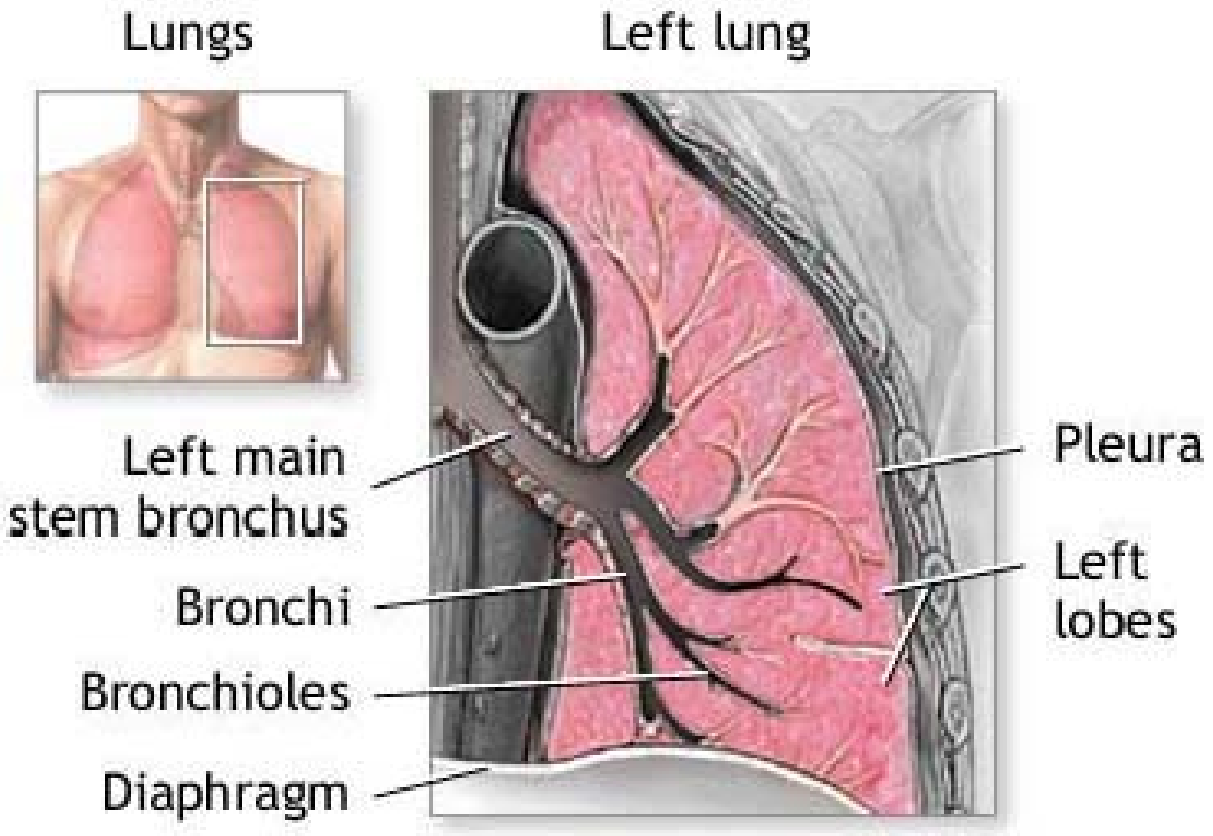


Predicting Difficult EGD Placement

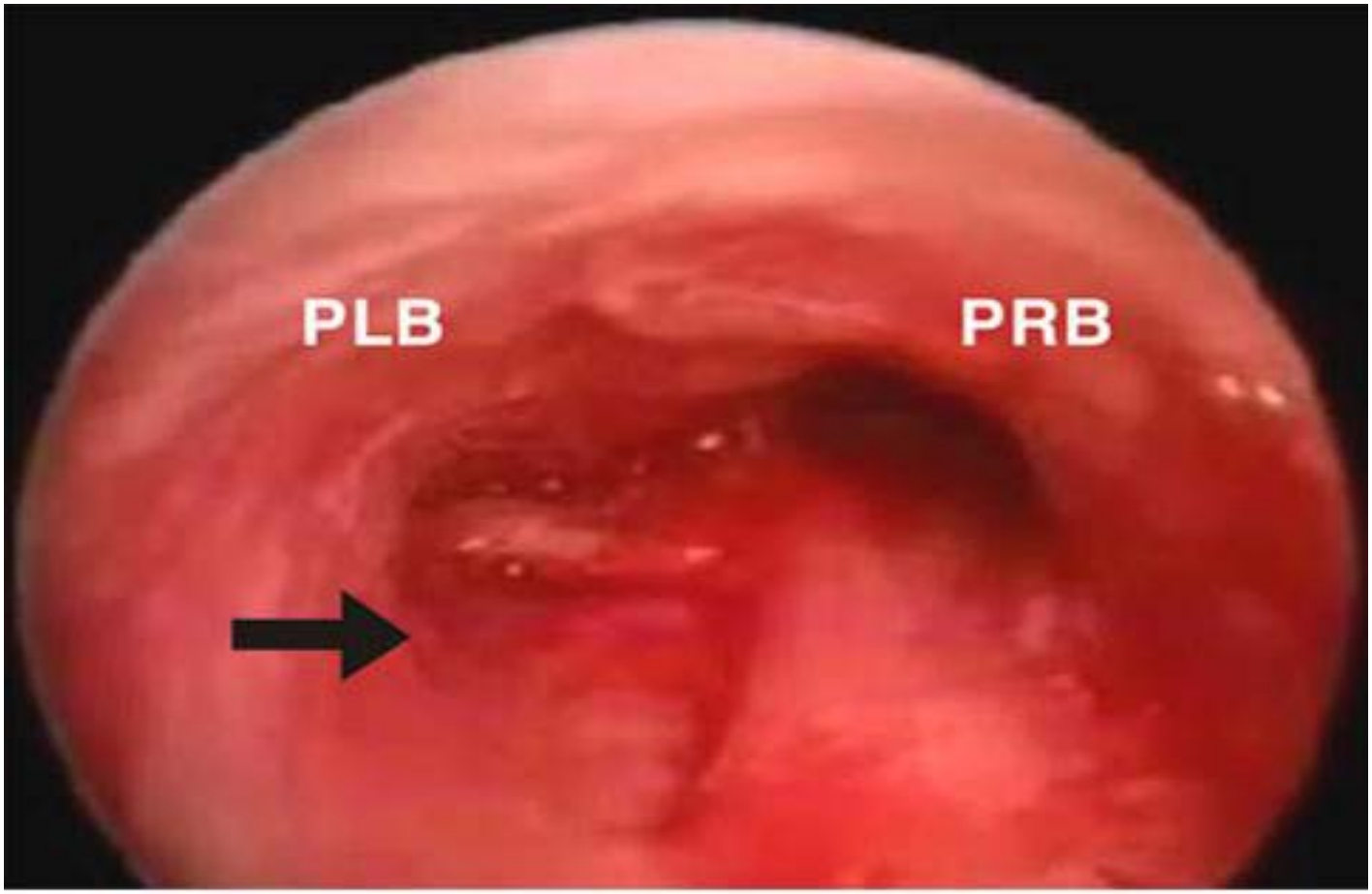
RODS

- **R**estricted mouth opening
- **O**bstruction at the larynx
- **D**isrupted/distorted airway
- **S**tiff Lungs

Restricted Mouth Opening

Obstruction at the Level of Larynx

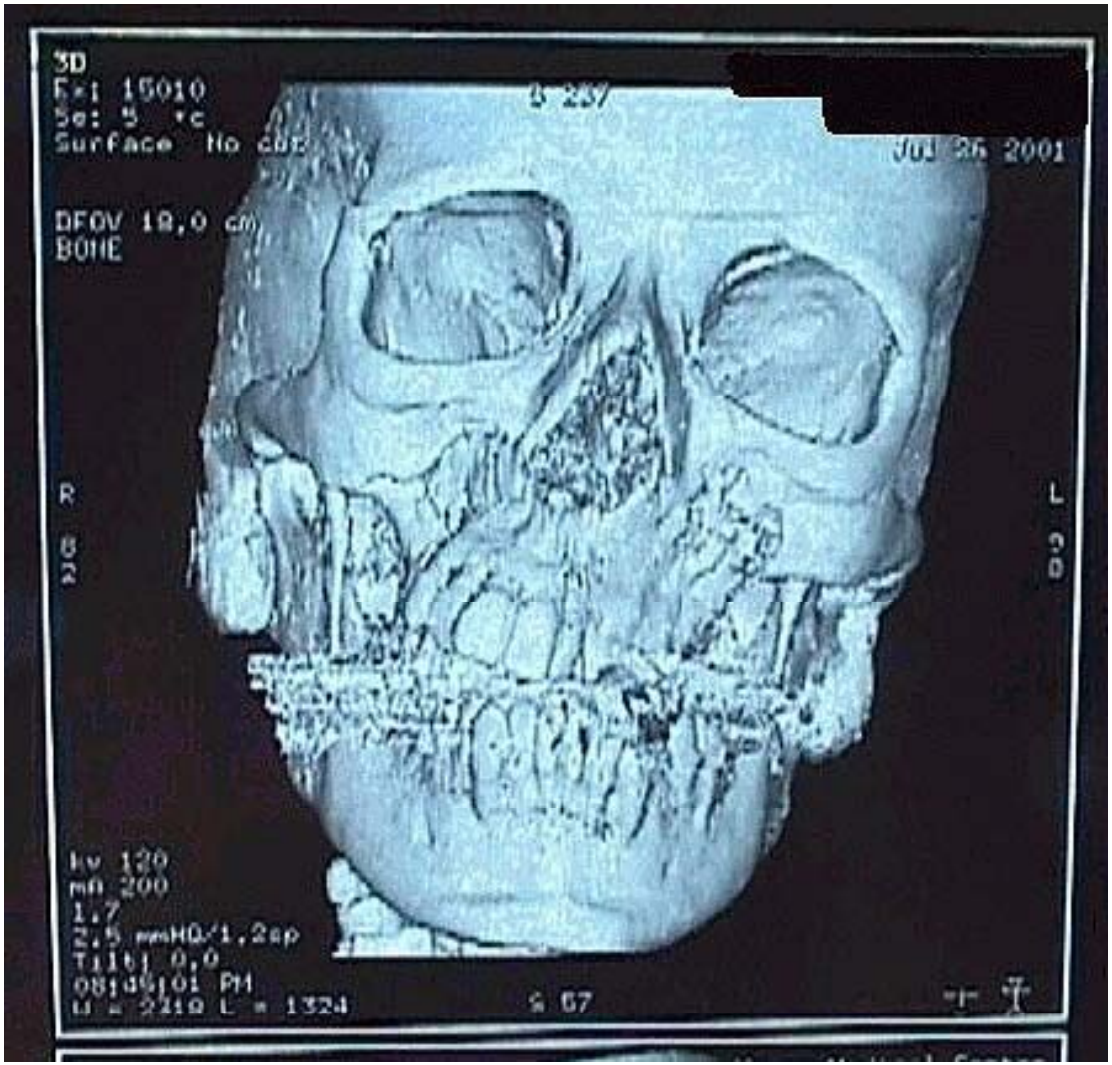
Disruption/Distorted Airway



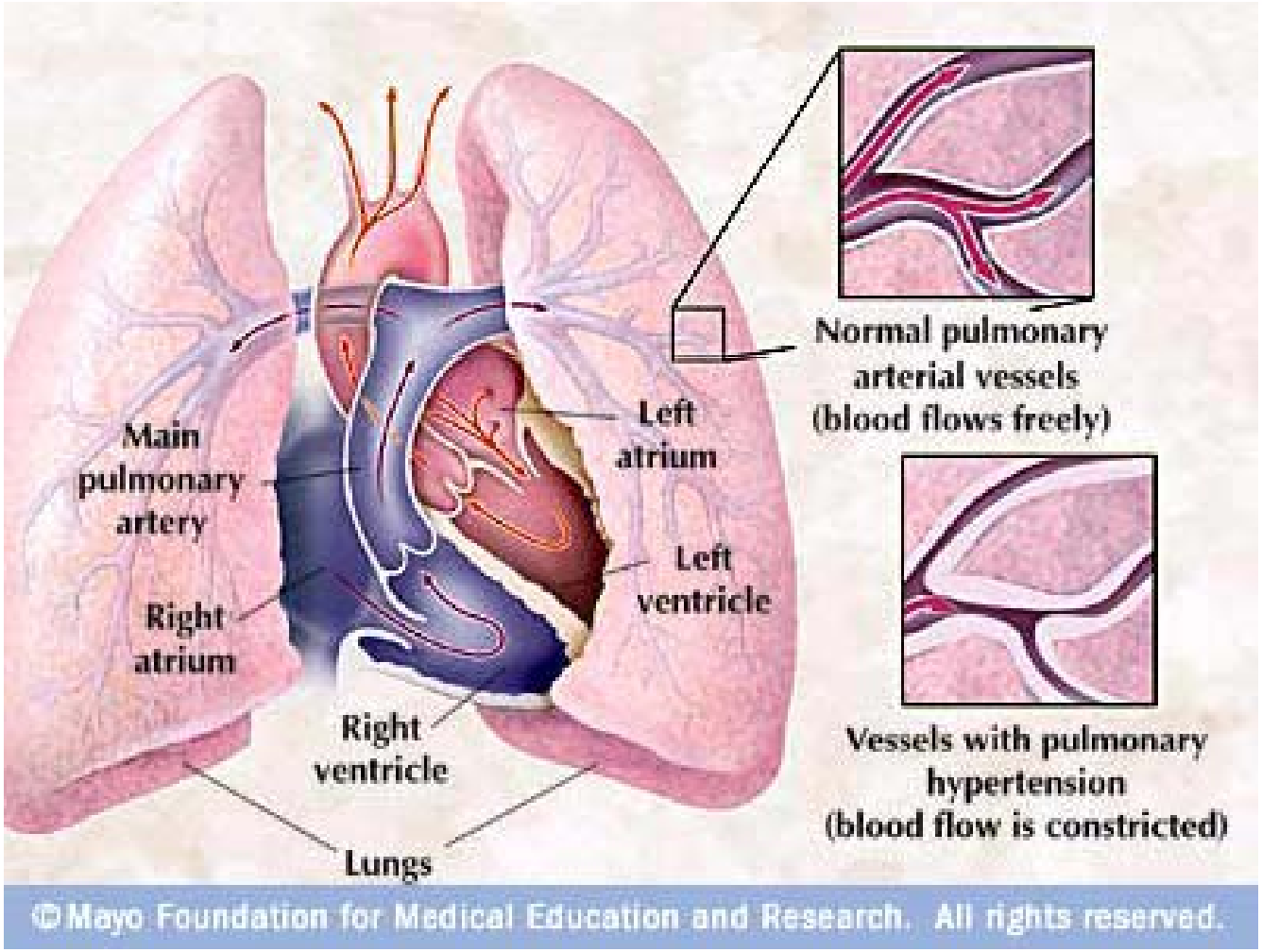
PLB = primary left bronchus; PRB = primary right bronchus

Figure 2 - Endoscopy imaging showing the airway rupture (arrow)

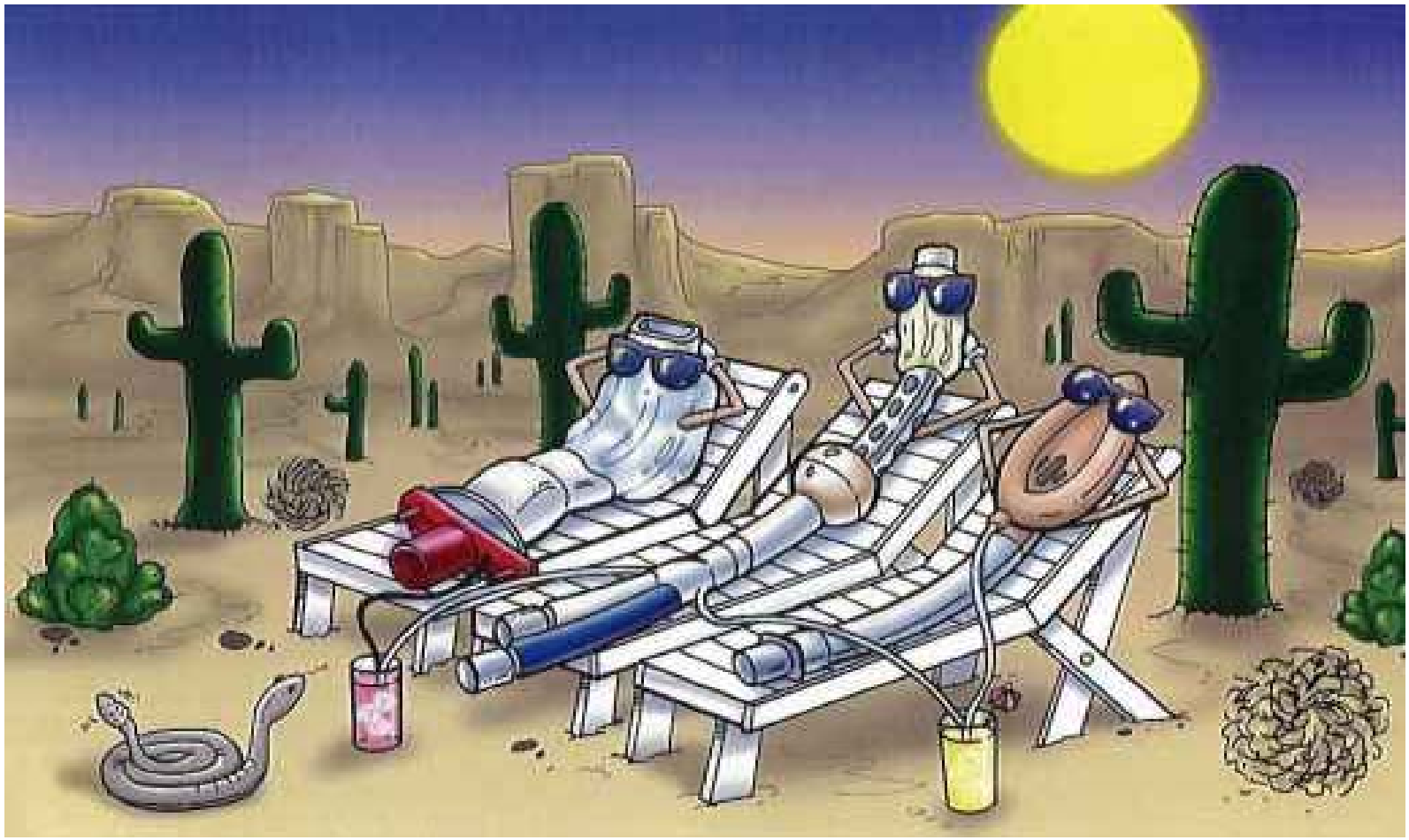
Disruption or Distortion



Stiff Lungs



Extraglottic Devices for EMT's



Extraglottic Devices for EMT's

Supraglottic Devices

- Laryngeal Mask Airways
  - LMA North America
    - Unique
    - Fastrach
    - Supreme
  - Cookgas Air Q
  - Ambu Aura
  - Others

Infraglottic Devices

- Esophageal Tracheal Combitube (ETC)
  - Combitube
  - Rusch EasyTube
- King LT

Laryngeal Mask Airways

LMA Unique (LMNA)

- #1 Neonate; up to 5kg
- #1.5 Infant; 5-10kg
- #2 Infant/Children; 10-20kg
- #2.5 Children; 20-30kg
- #3 Children; 30-50kg
- #4 Adults; 50-70kg
- #5 Adults; 70-100kg

Possible to place ETT

LMA Fastrach - ILMA

- #3 Children; 30-50kg
- #4 Adults; 50-70kg
- #5 Adults 70-100kg

Laryngeal Mask Airways

Cookgas Air Q

- 1.5 pediatric
- 2.5 Children/Adults 20-50kg
- 3.5 Adults 50-70kg
- 4.5 Adults 70-100kg

Made to accept ETT

Preparation/insertion similar to LMA Unique

Laryngeal Mask Airways

AMBU Aura Straight

- 1 <5kg
- 1.5 5-10kg
- 2 10-20kg
- 2.5 20-30kg
- 3 30-50kg
- 4 50-70kg
- 5 70-100kg
- 6 >100kg

Possible to place ETT

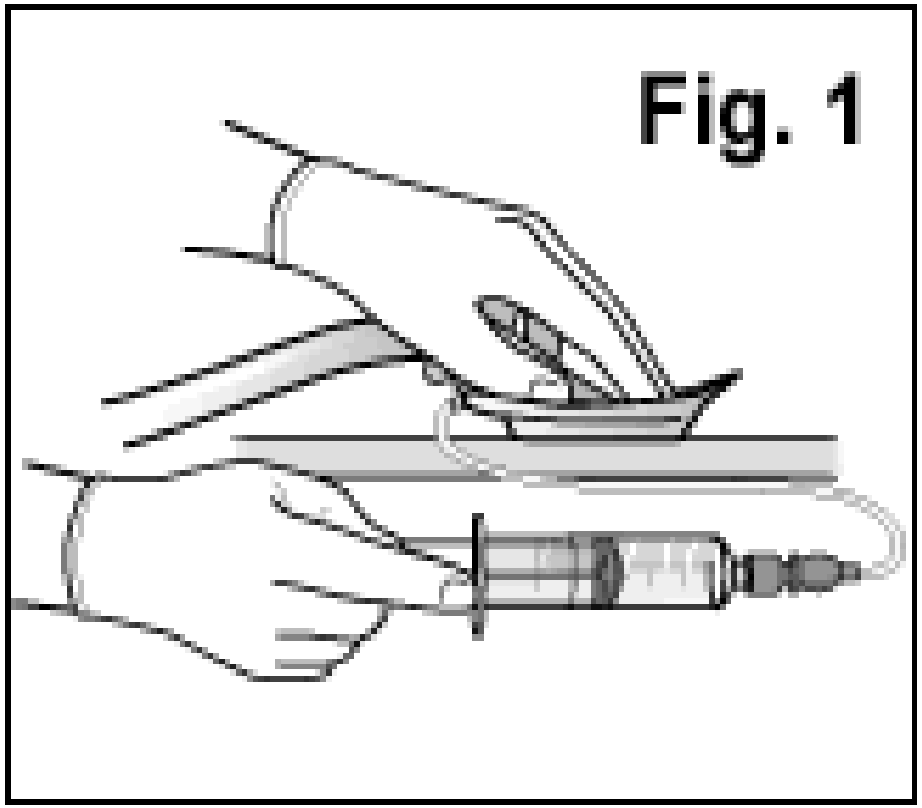
Preparation/insertion similar to LMA

Laryngeal Mask Airways Insertion

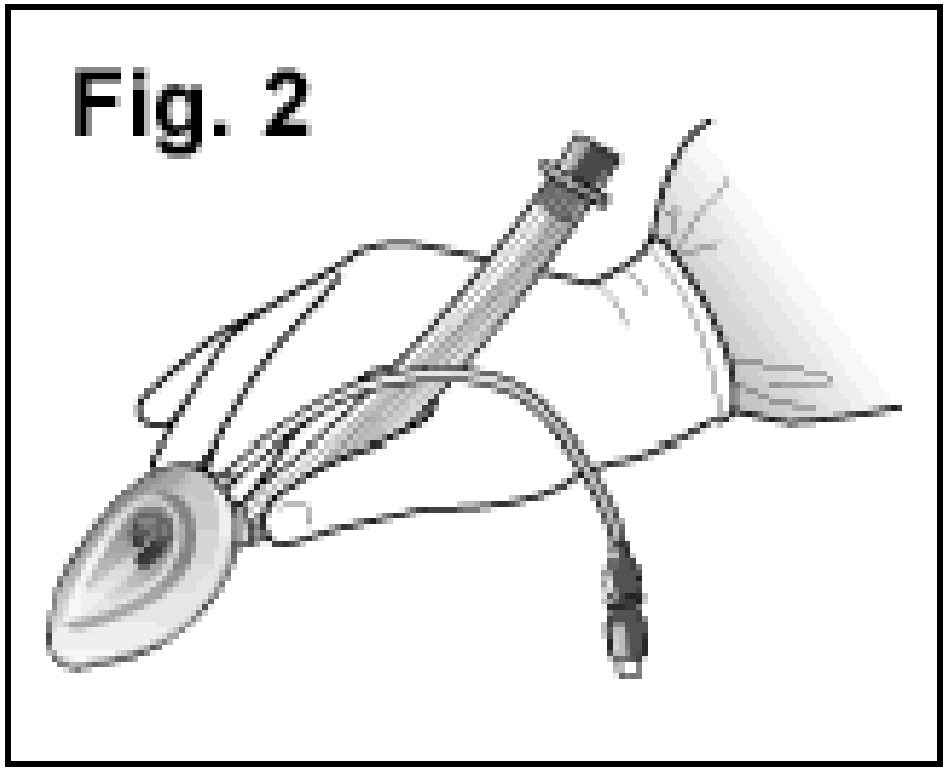
General Insertion Guidelines

- Visually inspect the device
- Place the device on a hard surface with collar down. Inflate the cuff and then deflate – ensure the cuff is not folded. Lubricate both sides of the cuff.
- Open the airway – jaw lift preferred. Grasp device like a pencil and insert. Maintain posterior portion of the cuff on the palate to avoid folding. Follow natural curvature of the airway.
- Inflate with the recommended amount of air or until there is no air leak.

LMA Unique Insertion



LMA Unique Insertion



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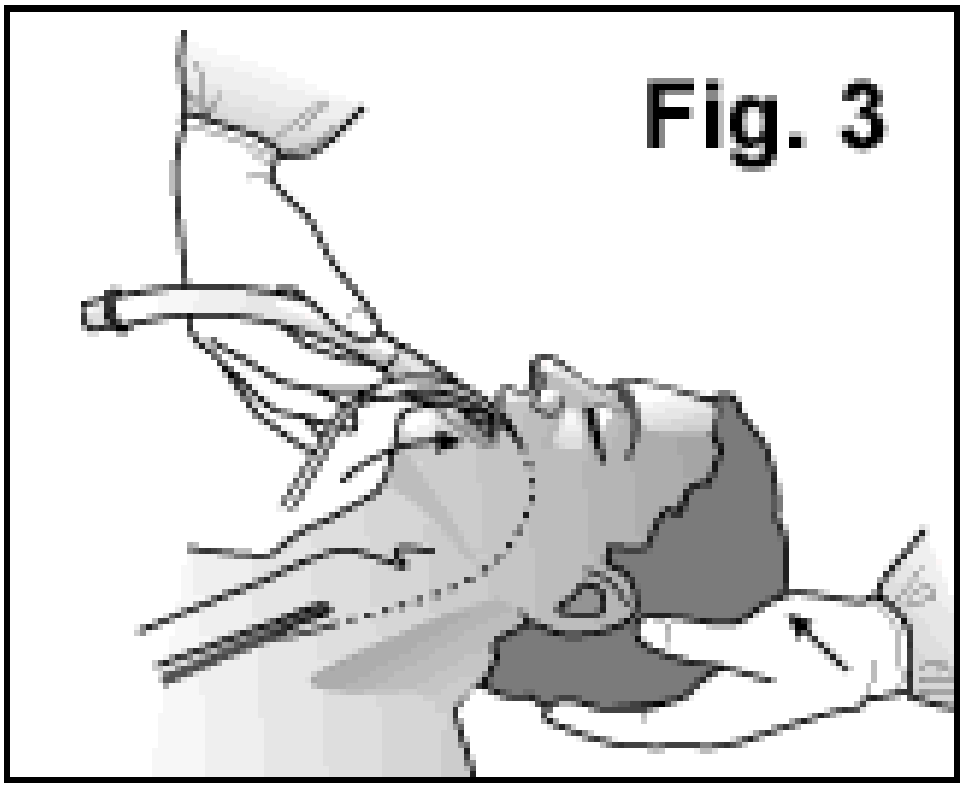

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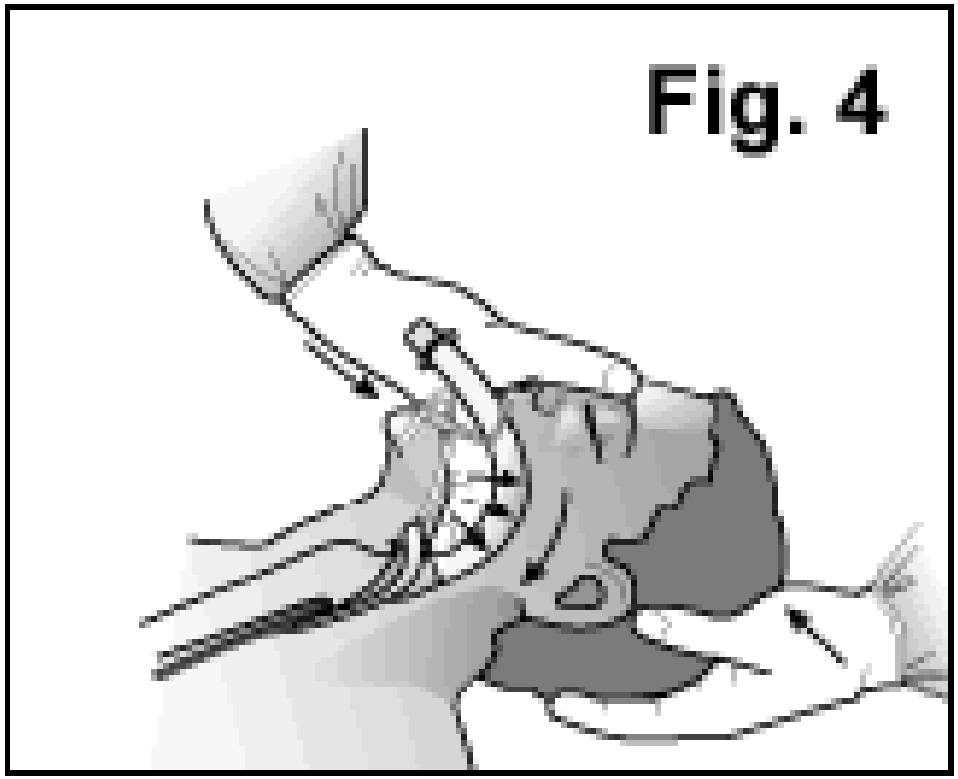

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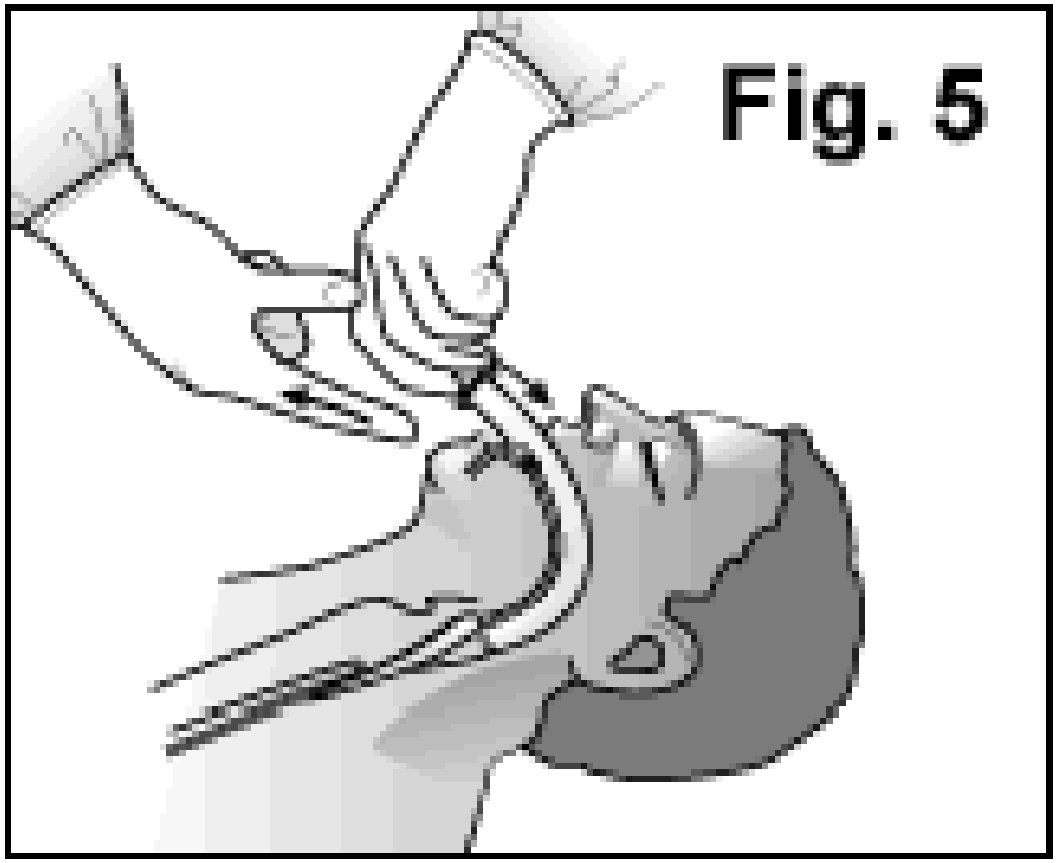

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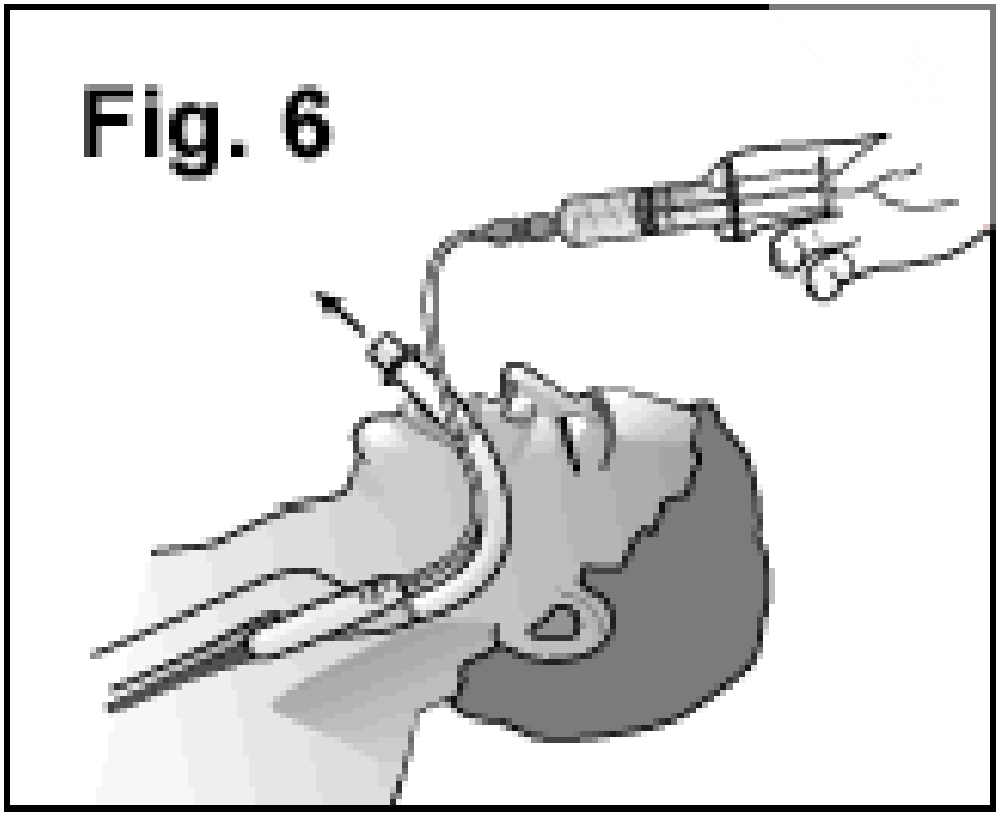
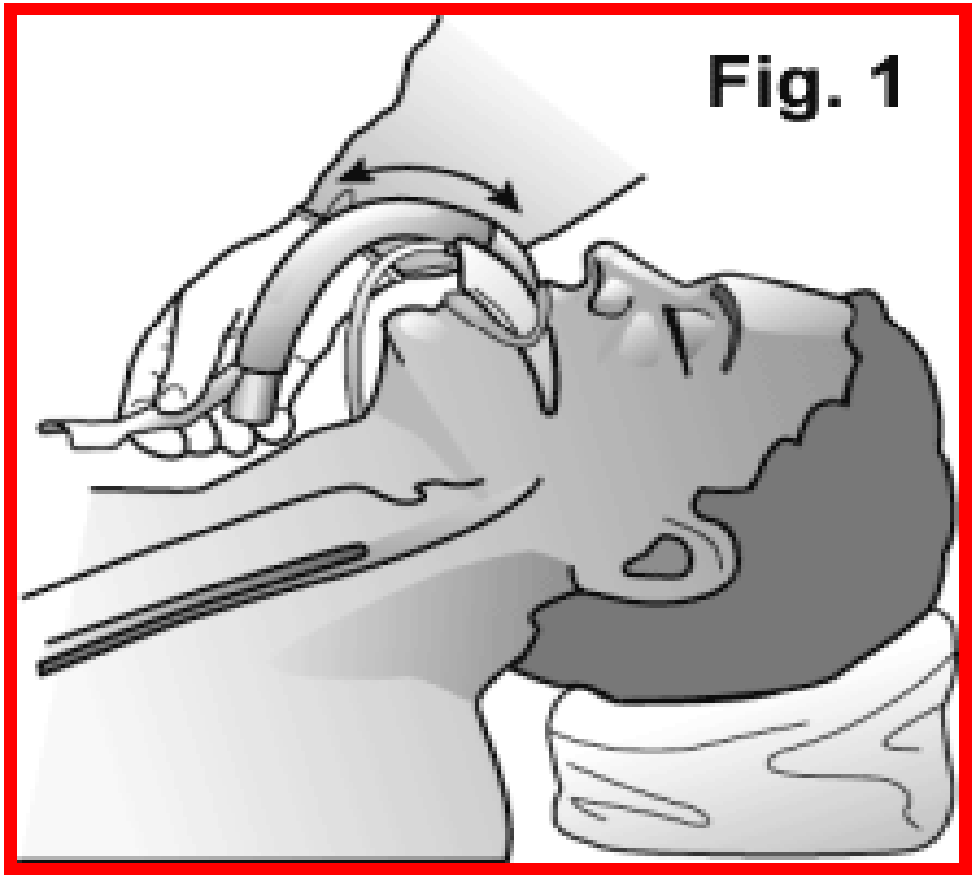
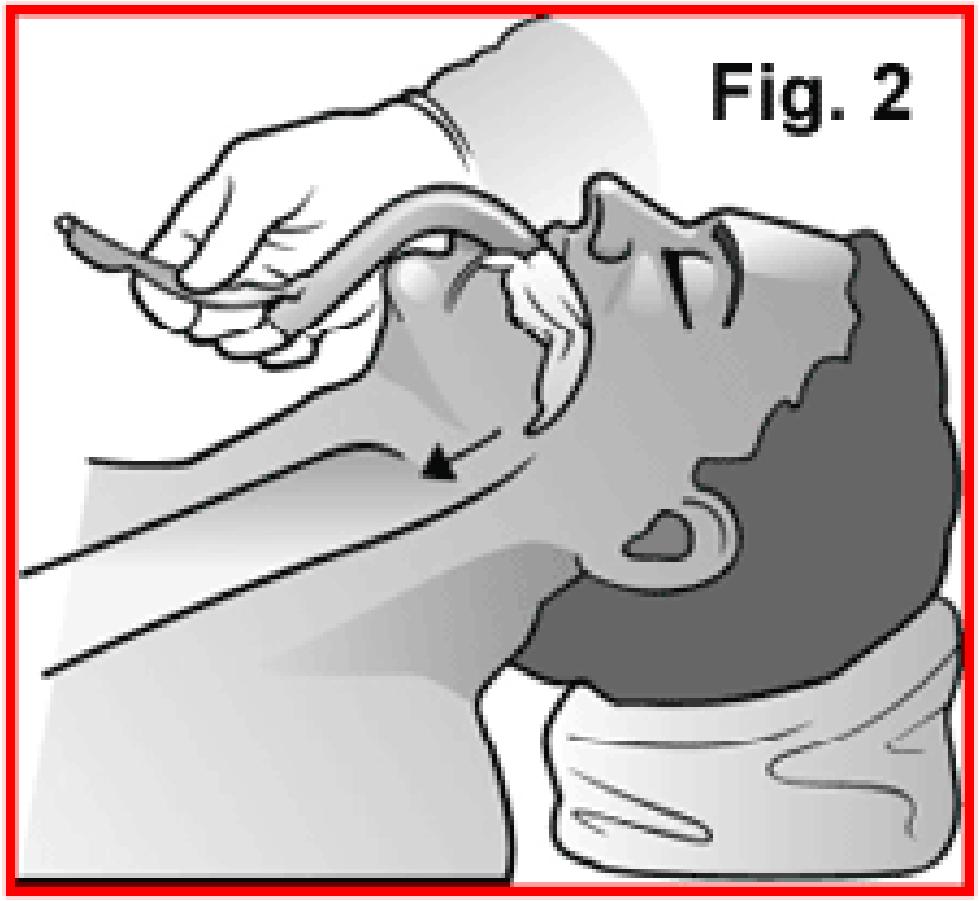


LMA Fastrach Insertion



LMA Fastrach Insertion



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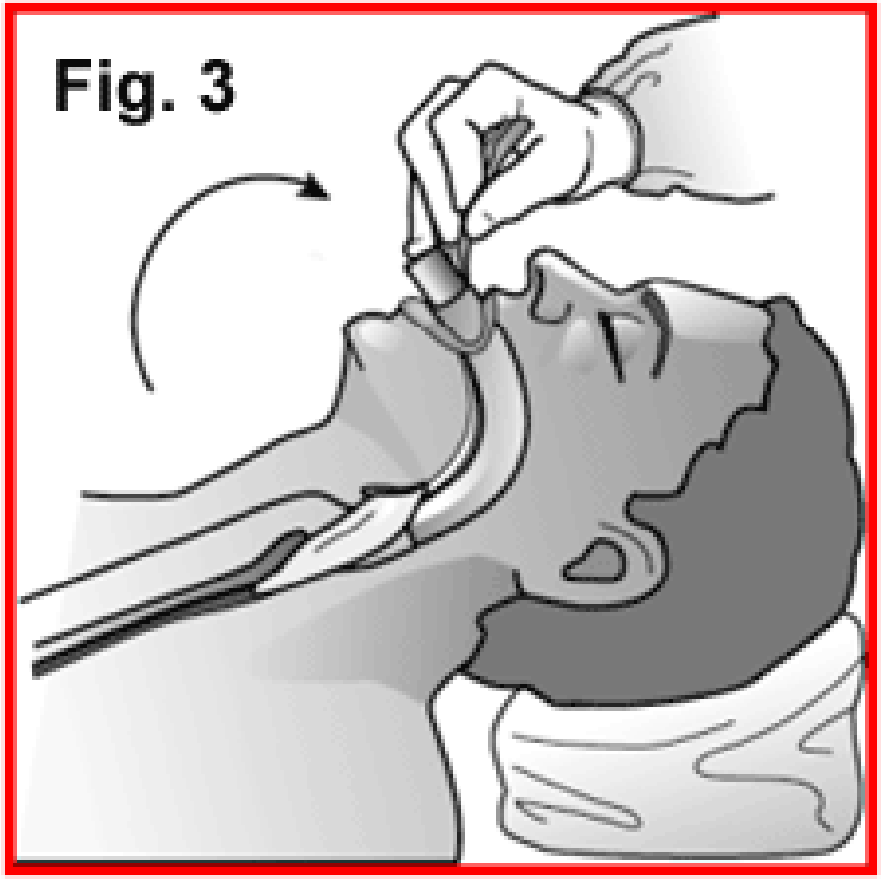
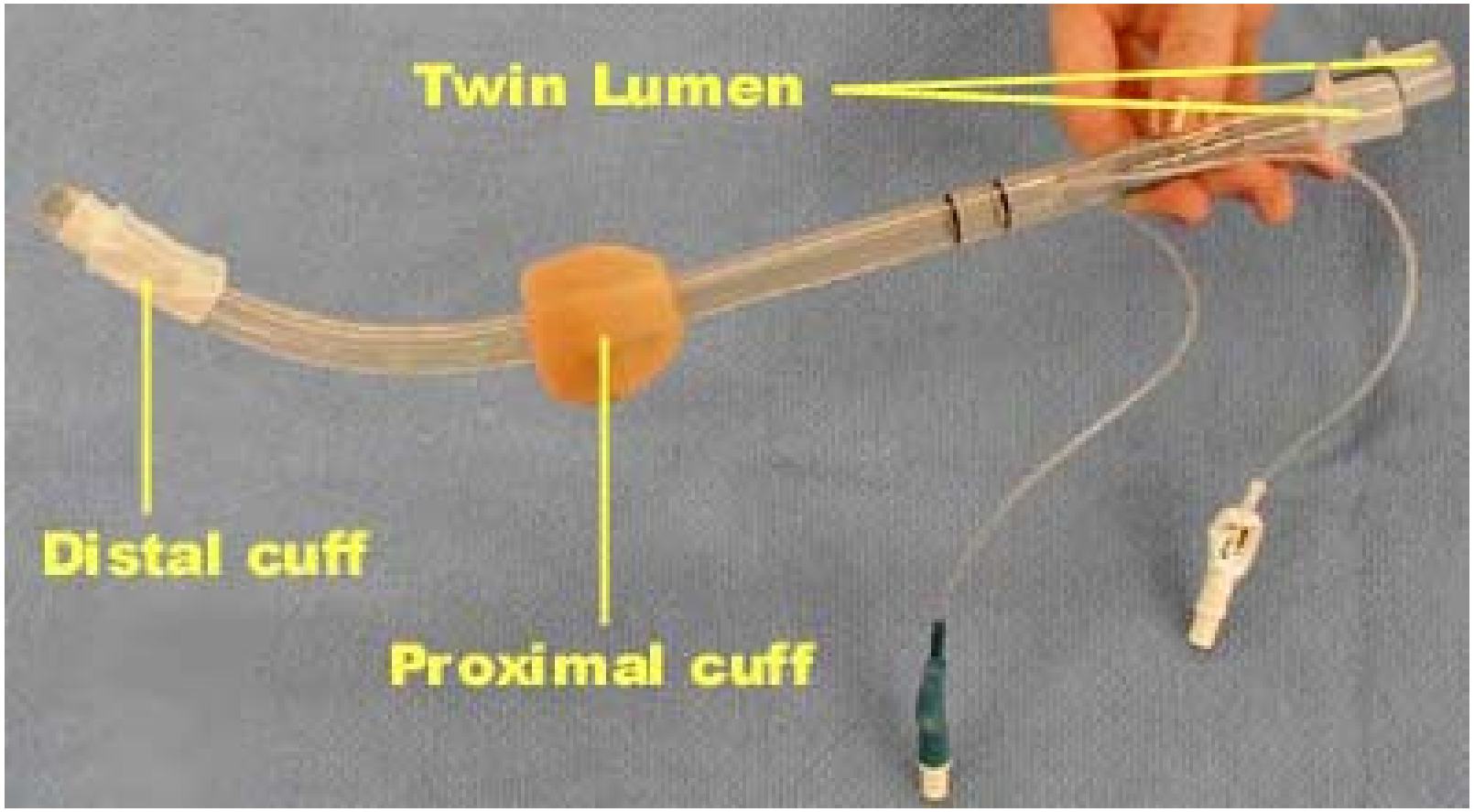


Combitube

Esophageal Tracheal Combitube

- Two sizes
  - 37F SA (small adult) for patients from 4’ to 5.5’ tall
  - 41F patients 5.5’ or taller
  - **NO “PEDIATRIC” SIZE**

Combitube



Combitube Insertion

- Perform jaw lift
- Insert in a midline position – allow the device to follow the natural curvature of the airway
- Inflate #1 port with proper amount of air
- Inflate #2 port with proper amount of air
- Attempt ventilation via #1 port – if unable to ventilate attempt use of port #2

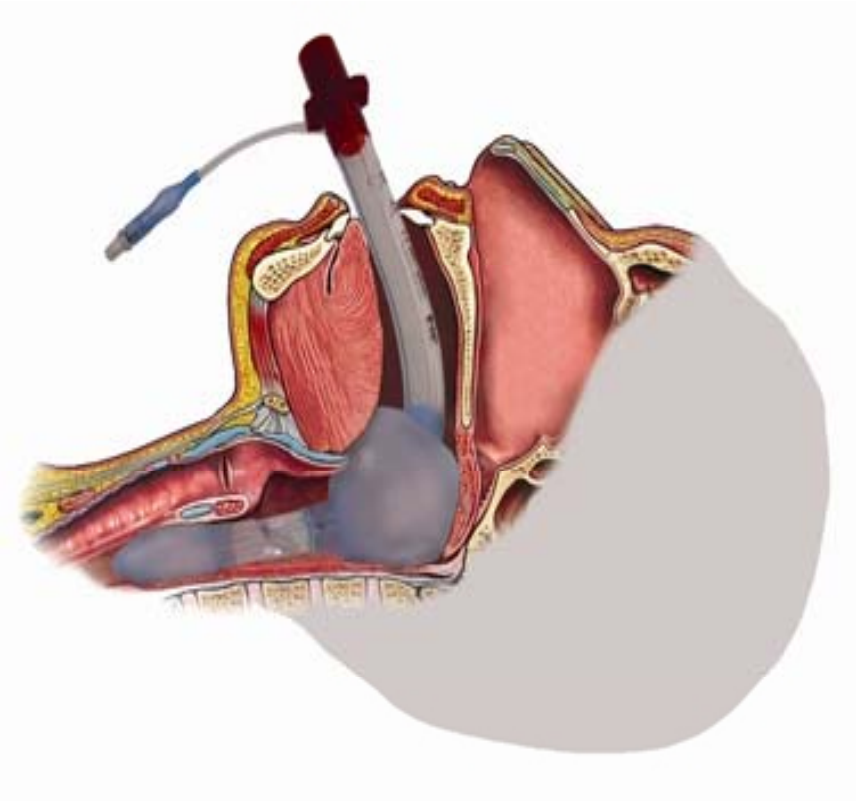
King LTD

King LTD

- #2; 35”-45” or 12-25kg
- #2.5; 41”-51” or 25-35kg
- #3; 4’-5’
- #4; 5’-6
- #5; >6’

King LTD Insertion

- Perform jaw lift
- Angled approach to place device under the base of tongue
- Rotate device midline so blue guide marks face the pt's chin
- Gently insert device until it seats
- Inflate with proper amount of air



Summary

- BMV is the mainstay of basic airway management and needs to be constantly practiced and honed as it may be the only skill that effectively exchanges gas
- EGD's are becoming increasingly popular for EMT use secondary to their ease of use and documented success