

Advanced Airway Management

PRESENTED BY:

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Advanced Airway Objectives

Advanced airway management is a relatively low frequency, high risk intervention.

The following education is intended to be used as a guideline.

In this class we will discuss:

- Reasons for advanced airway placement.
- Basic airway anatomy.
- How to prepare for advanced airway placement.
- Equipment needed for intubation.
- Roles of providers performing and assisting with advanced airway.
- Recognition and mitigation of a difficult airway.
- Intubation Techniques.
- Post intubation care and management.

Reasons for Advanced Airway Placement

GCS less than 8 intubate?

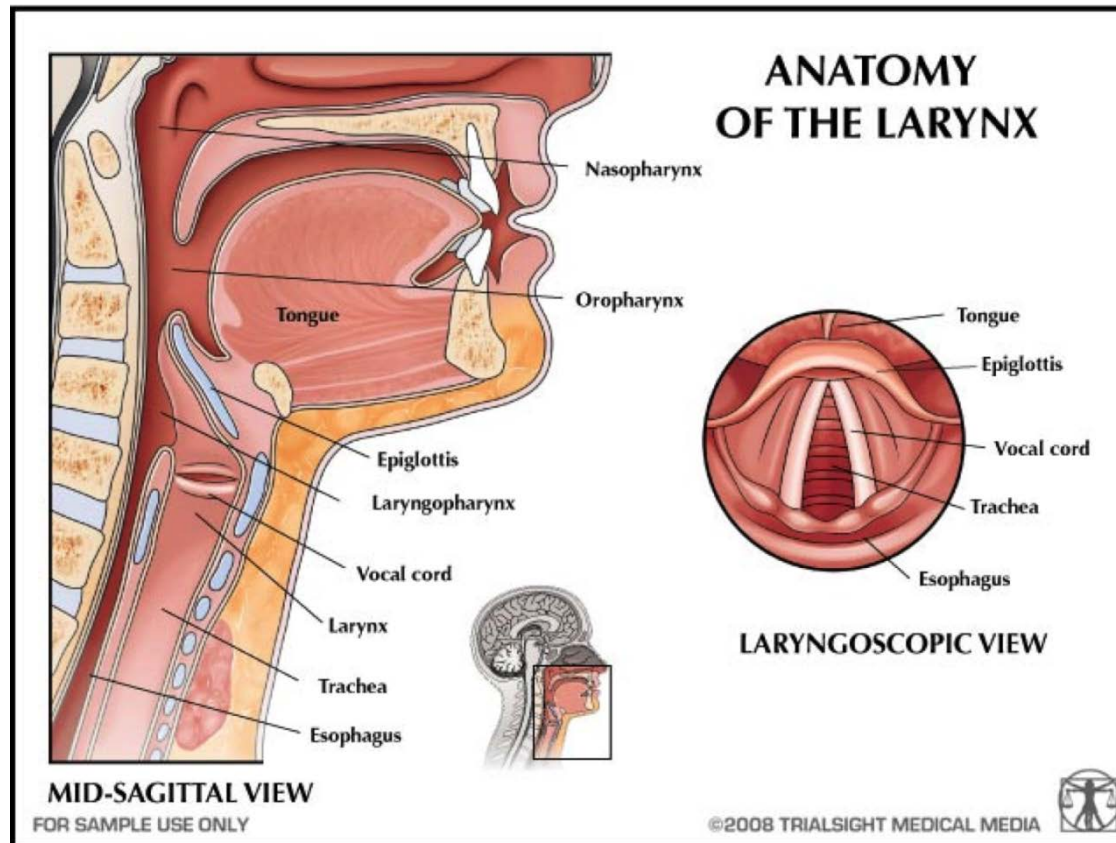
- The old saying is to be used as a guideline, which is typically right.
- Could you elect to intubate a GCS 15?
 - Yes, for many reasons. (Safety, Early inhalation burn recognition, ect).

When less invasive means to oxygenation and/or supported ventilation are ineffective.

- High flow oxygen is ineffective.
- Patient requires ventilation support.
- CPAP, BiPAP ineffective in oxygenation, assistance with ventilation.

Airway protection is needed due to altered mental status.

Basic Airway Anatomy



How to prepare for Advanced Airway Placement

Prepare equipment. (Primary and Backup)

Preassigned roles. (Team lead and Supportive roles)

Pre-oxygenation.

Prediction of the difficult airway.

Pre-intubation time out.

Pretreatment.

Paralysis.

Placement of ETT

Post intubation management and care.

Pain management.

Prepare Equipment

Laryngoscope (Video, or Traditional)

Laryngoscope blade (Primary, Backup)

Endotracheal tube and lubricant (ETT size you want, one size down)

ETT Introducer (Bougie)

ETT Stylette (hockey stick)

ETT securement device

Back up airway (King airway, tgel, LMA)

Cuff pressure manometer (prevent tracheal ischemia)

Suction

BVM with Peep Valve

Oxygen (adequate supply)

Ventilator

Preassigned Roles

Try to use an ACLS style with clear communication techniques.

Assign a team leader- oversee the big picture

Assign a medication administrator

Assign provider to Intubate

- solo focus is placement of airway

Assign an equipment runner

- someone familiar with location of equipment and supplies in the department

Assign a person to secure ETT

Assign a person to confirm ETT placement

Assign a person to ventilate the patient

- Recognize that in your department you may have limited providers. In this instance these preassigned roles are critical to the success of the intervention.

Pre-oxygenation

Take time to provide the patient optimal oxygenation status by the following means:

- Provide 15L flow oxygen via NRB. If BiPAP/CPAP is on increase FiO₂ 100%.
 - The goal of high flow oxygen is to maximize the saturation of hemoglobin with oxygen.
 - High flow oxygenation will provide a nitrogen washout and provide longer pulmonary reserve.
- Position your patient up to decrease work of breathing.
 - Takes the weight off chest, allows for greater chest expansion, deeper inspiratory effort.
- If patient requires ventilation support use a BVM with good mask seal.
 - Provide good mask seal with BVM and attached PEEP valve.
 - E-C hold vs 2 person bagging technique.
- Provide passive oxygenation throughout entire intubation process.
 - Passive oxygen via nasal cannula at high flow during the intubation process provided the patient with a flow rate that has been proven to decrease hypoxic events during prolonged intubation. Pulmonary reserve is maximized using both high flow pre-oxygenation and passive flow oxygenation.

Prediction of Difficult Airway

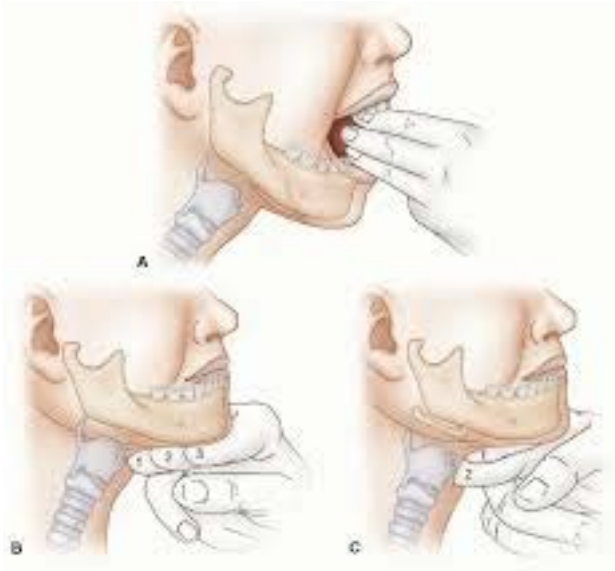
Physical Presentation

Size of the patient - pediatric vs adult

The following are techniques used to determine a Difficult Airway

- 3-3-2 Technique
- LEMON
- Mallampati Score
- MOANS

3-3-2 Rule



To assess patient:
3 fingers between teeth.
3 fingers between mentum and hyoid bone.
2 fingers between hyoid and thyroid notch.

LEMON

- Look Externally.
 - Beard, Bird Mouth, Thick Neck...
- Evaluate (3-3-2)
- Mallampati
- Obstruction
- Neck Mobility
 - Trauma, cervical collar, spinal fusion, arthritis

Mallampati Score

The Mallampati Score



CLASS I
Complete
visualization of
the soft palate



CLASS II
Complete
visualization of
the uvula



CLASS III
Visualization
of only the
base of the uvula



CLASS IV
Soft palate
is not
visible at all

This test requires patient to be sitting upright with their head in a neutral position. Ask the patient to open their mouth and extend their tongue.

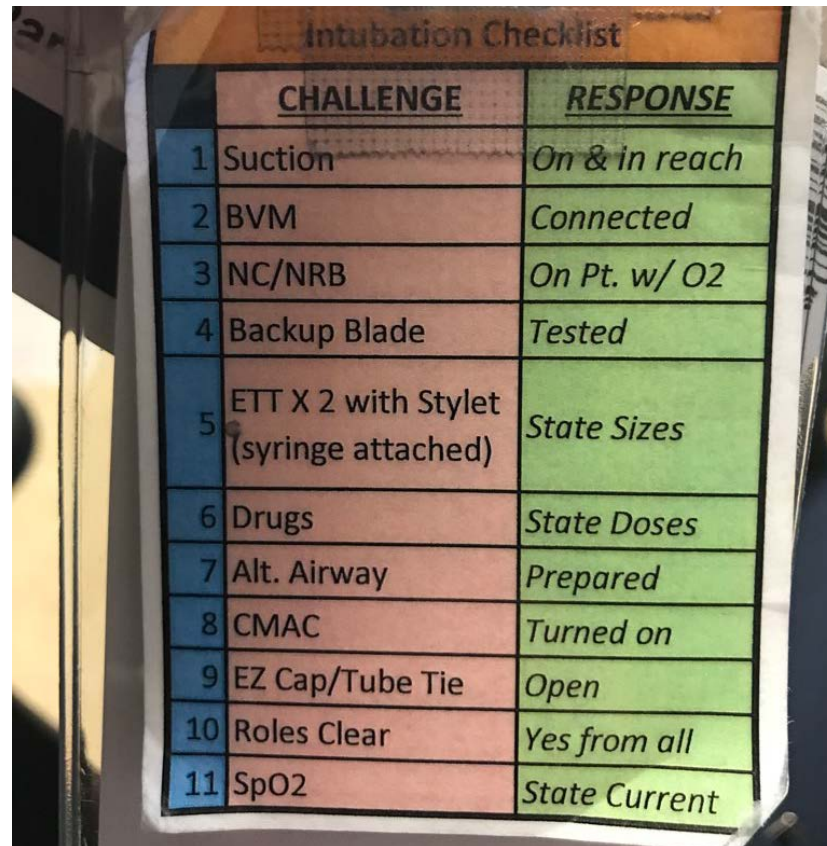
Difficult Mask Seal

∞ MOANS

∞ Two person bagging.

- Mask seal – beard, receding mandible etc.
 - Obesity – upper airway obstruction.
 - Advanced age - >55 years.
 - No teeth – dentures.
 - Sleep apnea/stiff lungs/snoring.
- Two person bagging is ideal for a difficult mask seal.

Pre-intubation time out



	<u>CHALLENGE</u>	<u>RESPONSE</u>
1	Suction	<i>On & in reach</i>
2	BVM	<i>Connected</i>
3	NC/NRB	<i>On Pt. w/ O2</i>
4	Backup Blade	<i>Tested</i>
5	ETT X 2 with Stylet (syringe attached)	<i>State Sizes</i>
6	Drugs	<i>State Doses</i>
7	Alt. Airway	<i>Prepared</i>
8	CMAC	<i>Turned on</i>
9	EZ Cap/Tube Tie	<i>Open</i>
10	Roles Clear	<i>Yes from all</i>
11	SpO2	<i>State Current</i>

Pretreatment

Know your facilities protocol. Providers preference.

○ Medications given for pretreatment stage include:

- Ketamine 2mg/kg
- Etomidate 0.3 mg/kg
- Versed
- Diprovan
- Fentanyl
- Atropine (pedatric).

Paralysis

(During induction phase) Provider intubating needs to provide the go ahead for medication administration.

- Succinylcholine 1.5-2.0 mg/kg
 - Duration (3-10 minutes)
 - Avoid in hyperkalemia, renal Failure, malignant hyperthermia, neuromuscular disease (MS,ALS), burns post 24 hours injury, crush injuries (5 days-months post injury), spinal cord injury, stroke (5days-6months) or Pseudocholinesterase deficiency.
- Rocuronium 1mg/kg
 - Duration (45 minutes)
 - Avoid with prior sensitivity to medication.

*Drug choice should never be based on "what if we don't get the tube". The medical decision to provide an advanced airway does not change. The provider must adapt to a difficult airway by utilizing a backup such as supraglottic airway devices (King Tube, LMA, etc)

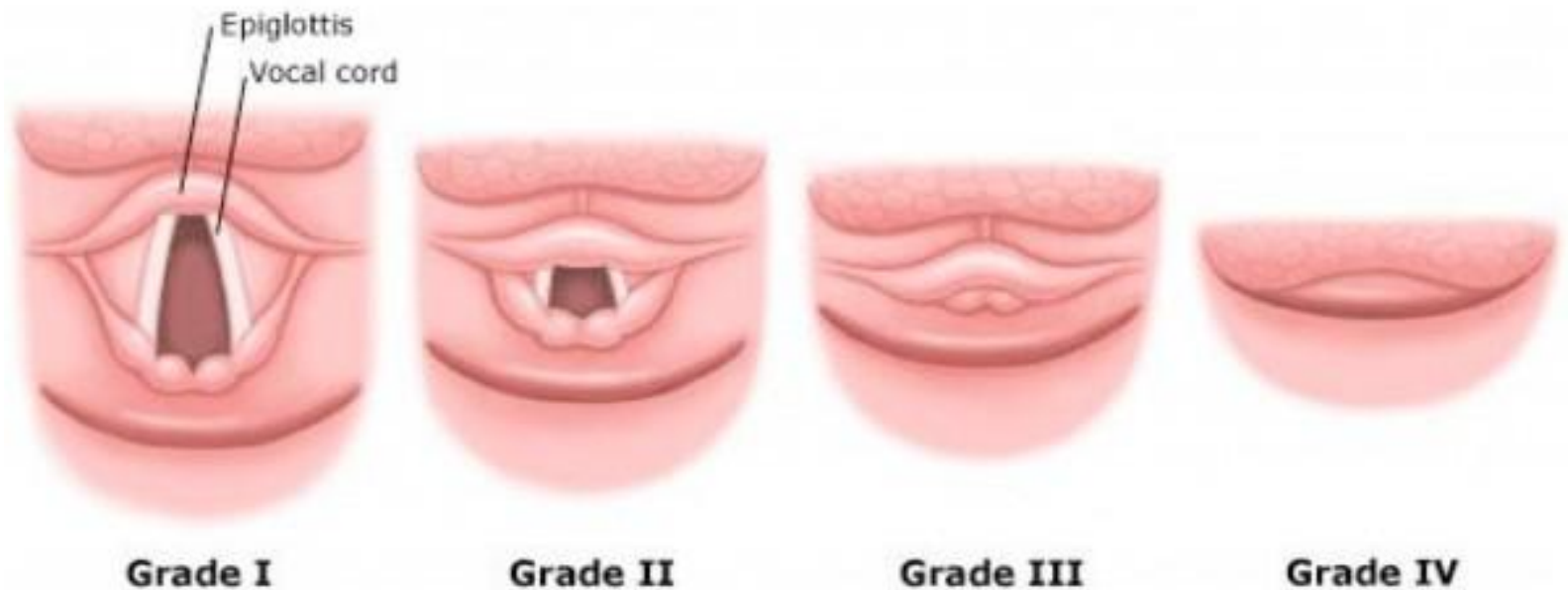
Placement of ETT



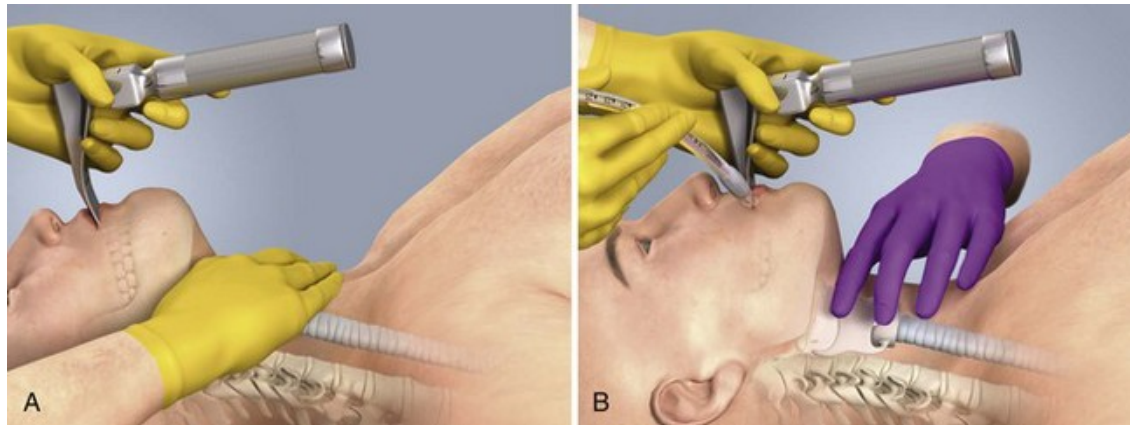
Placement of ETT



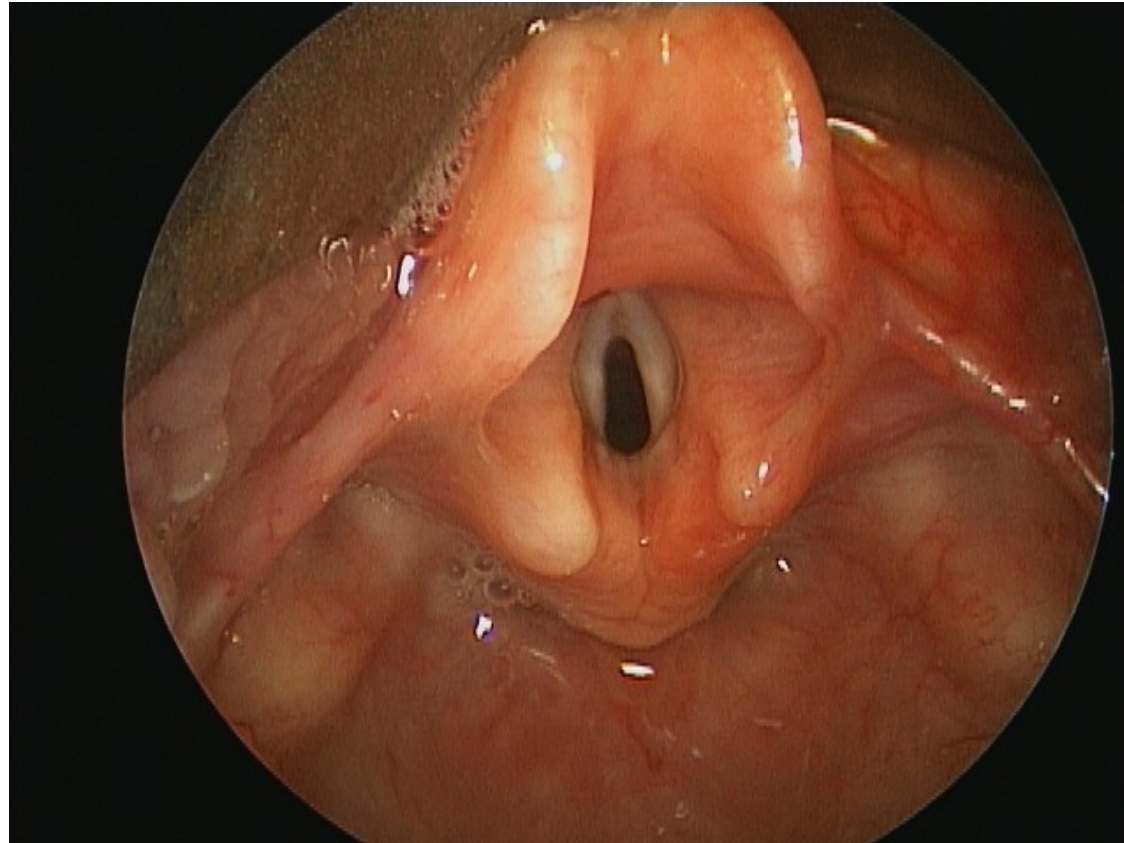
Intubation Grade Views



External Laryngeal Manipulation



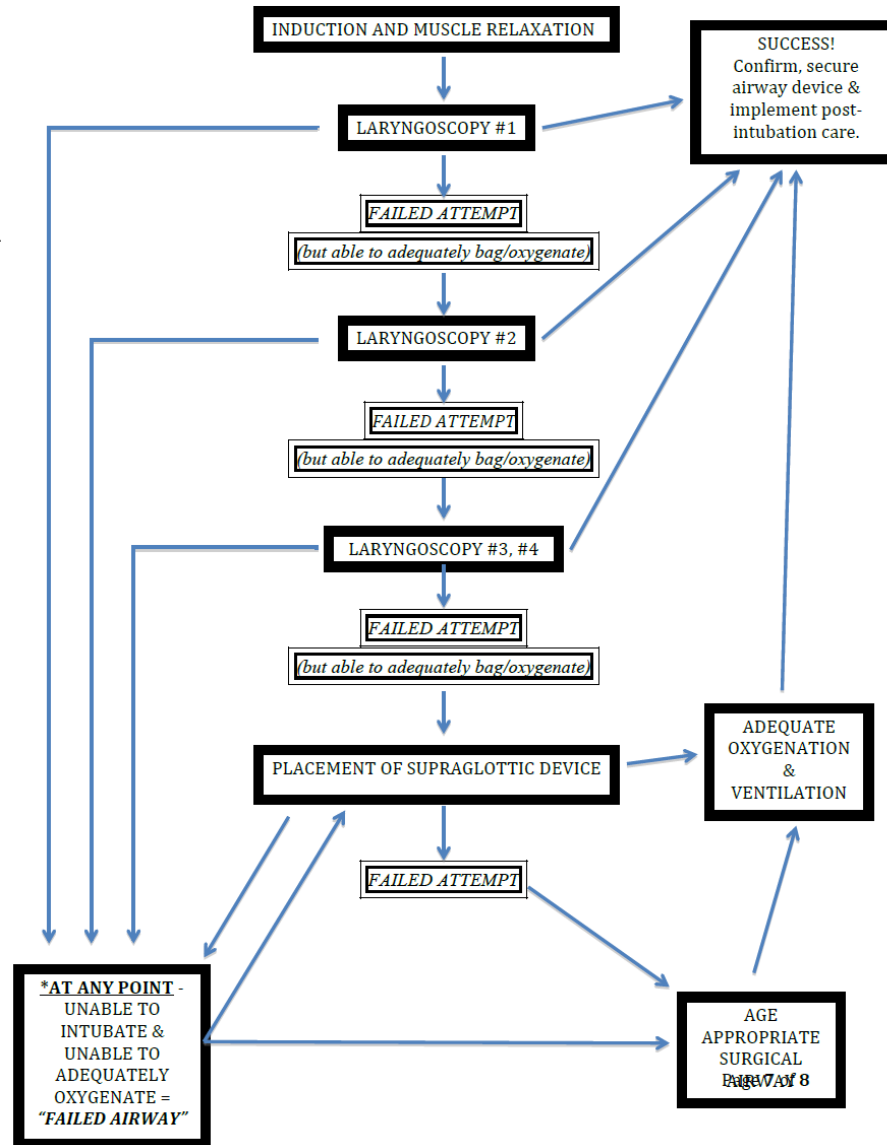
Revised view after ELM



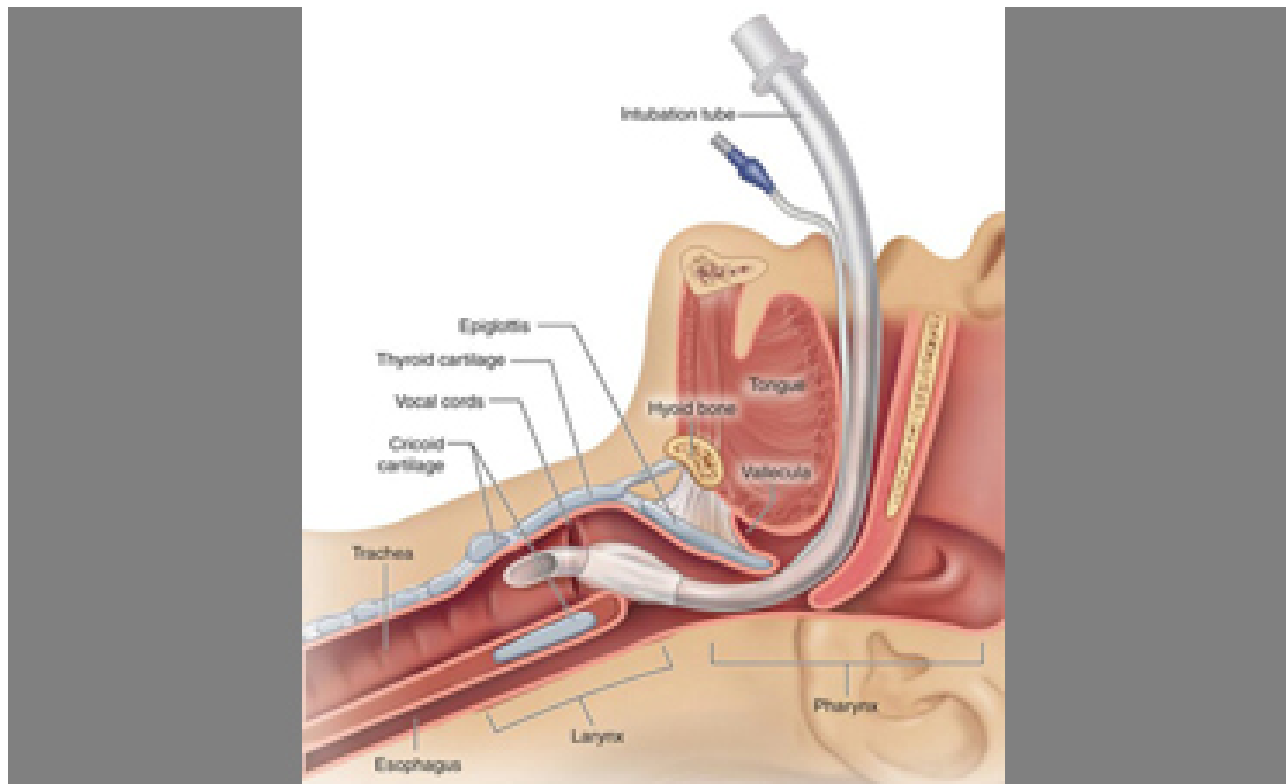
Head Elevated Laryngoscopy Position



CAREFLIGHT DIFFICULT AIRWAY ALGORITHM



ETT Placed



Post intubation management and care

Confirmation of ETT primary function post advanced airway placement

- Direct visualization of insertion by provider
- Auscultate stomach first
- Auscultate lungs second
- Watch for symmetrical chest rise and fall with ventilations per BVM.
- Qualitative ETCO₂ controversial (EZCAP, EZCO₂)
 - Quantitative ETCO₂ with wave form is gold standard for ETT placement.
- Oxygen saturation level.

Post intubation management and care

Secure ETT and measure for depth at dentation if applicable.

Measure ETT cuff pressure.



Quantitative ETCO₂

✎ Why is ETCO₂ so great, why the gold standard?

- “the potential clinical benefits of continuous capnography clearly outweigh any potential risks.”
- “life-threatening airway disasters can be averted with continuous capnography.”
- “capnography reveals changes in circulatory and respiratory status sooner than does pulse oximetry.”
- “mechanical ventilation can be optimized and the duration of mechanical ventilation potentially minimized with continuous volumetric capnography.”

*Bottom line is that capnography is vital to monitoring not only airway, ventilation but overall cardiorespiratory status.

Apply Ventilator/Bag

If applicable always place patient on a mechanical ventilator with settings appropriate to patient's condition/patient's effort.

If mechanical ventilator is not available ensure peep valve is on and set to desired peep to maintain SPO2 desired, and flow remains present to BVM.


Maintain as consistent ventilations as possible while having someone to switch with to avoid fatigue. Much the same as ACLS compressions.

Avoid hyper or hypoventilation while bagging patient. Use ETCO2 and patient's clinical diagnosis to aid in appropriate ventilation techniques.

Pain Management



- Sedation: Provide post intubation sedation promptly and maintain frequent sedation/pain control schedules regardless of paralytic choice.
- Consider use of CPOT tool for intubated patients.

CPOT



- ① Facial Expression: No muscle tension / relaxed
- ① Body Movement: None
- ① Muscle Tension: Relaxed
- ① Compliance with Ventilator: Alarms not active & easy to ventilate

CPOT



- ② Facial Expression: grimacing
- ② Body Movement: restlessness
- ② Muscle Tension: very tense
- ② Compliance with Ventilator: fighting, asynchrony & alarms

Patient Discussion Scenario

- What do we know?

- Age
 - 62
- Weight
 - 140 kg
- HPI
 - Respiratory distress respiratory rate of 26 with impending failure per EMS, History of MS.

- How can we prepare for this patient before we arrive with this newly gathered Information?

- Calculate RSI meds
 - Calculate drugs... What can you eliminate?
- Have a set plan of events/jobs upon arrival.
 - Who's going to intubate?
 - Does this patient have a high risk for a difficult airway?
 - What is our primary plan and back up plans.
 - What equipment will we need? (ETT, Blade Size)
- Talk with you team, use their experience, and never assume anything..

*All plans can change but this approach will set you up for the best success as you have time to plan, change your plan, and adapt if needed.

HPI continued

Do we need an Advanced Airway?

-Yes. However, even if you disagree, the preparation for an advanced airway will indeed maximize the patients clinical condition.

- Consider patient's anticipated clinical course.

- Consider your environment should you elect to attempt BiPAP or other means as an alternative to a definitive airway.

In Summary

Use your protocols.

Use preplanning techniques.

Communicate plan of care with your team.

Have clearly defined roles and responsibilities.

Perform the intervention.

Provide pain/sedation medications frequently in acute phase.

Provide quality oxygenation and ventilation support.

Please feel free to ask John or I any questions you may have.

If you would like us to present ventilator education or any other education topics in the future please Contact Cindy P. at Avera E-Care.

