“It is not enough to do your best, unless you have prepared to be the best”.

-John McDonald
Introduction

- The primary objective of emergency airway management is to **oxygenate** and **ventilate** the patient.
- You must be prepared to assure optimal oxygenation and ventilation through proper airway management.
  - Brain death occurs in 6-10 minutes.
Objectives

- Recognize normal airway anatomy.
- Identify clinical conditions that require airway management.
- Use indicators to predict a difficult airway.
- Discuss options and techniques used to establish and maintain airway patency.
Airway Anatomy
Airway Management

Clinical Indications

- Airway failure or impending airway failure
- Inability to protect airway (observe for spontaneous swallow)
- Do not check a “gag”
- Inadequate ventilation / oxygenation
- Presence of clinical conditions that require active management of the patient and/or the patient’s airway, now or in the future
- Always ask do they need intubation right now
Difficult Airway Assessment

- LEMON
  - Look externally
  - Evaluate 3-3-2
  - Mallampati Score
  - Obstruction
  - Neck Mobility
Difficult Airway Assessment

- LEMON
  - Look externally
Difficult Airway Assessment

- **LEMON**
  - Evaluate 3-3-2
Difficult Airway Assessment

- LEMON
  - Mallampati Score

Diagram showing different stages of Mallampati scores.
Difficult Airway Assessment

- LEMON
  - Obstruction

Epiglottis
Difficult Airway Assessment

- LEMON
  - Neck Mobility
Difficult Airway Assessment

Three Quick Questions

1. Can the patient open his mouth wide?
2. Does the patient have a chin?
3. Can the patient move his neck?
HEAVEN Criteria

- Another tool being looked at
- Shown to predict difficult airway
- **H**ypoxemia
- **E**xtremes of size
- **A**natomic challenges
- **V**omit/blood/fluid
- **E**xsanguination/anemia
- **N**eck Mobility
Airway Management

What is the right airway?

- If you have an effective BLS airway, you have to consider
  - Does the benefit of placing an advanced airway outweigh the potential adverse effects of that attempt?
  - Time
Apnea time and Airway Management

- As part of RSI there will be a period of patient apnea that we will need to deal with
- Pre oxygenation adds time for safe apnea
- Ability to BVM is key (MOANS)
- Can I use a Supra Glottic Airway (RODS)
- Can I do surgical airway (SHORT)
- These help us decide how we can manage the airway during the apnea time
Can I BVM them?

- MOANS

- Mask seal? Worse with facial hair, trauma, burns
- Obstruction/Obese Both make BVM difficult
- Age over 55 more redundant loose tissue
- No teeth Leave teeth in for BVM out for ETI
- Stiff Lungs, need more pressure Asthma, inhalation etc.
Will a Supra Glottic Airway work?

- RODS
- Restricted mouth opening
- Obstruction
- Distorted anatomy
- Stiff lungs.
SHORT

- Surgery (distorted anatomy)
- Hematoma (Blood includes infection)
- Obstruction/Obesity
- Radiation (Fresh or old)
- Tumor

This is a mnemonic for possible difficulties with cricothyrotomy.
Obstruction is not your Friend

- Note that Obstruction is in every pneumonic
- Airway obstruction and inability to manage the airway with our tools leads you quickly to a surgical crich.
Airway Management

“Performing an intubation is generally easier than deciding which intubation technique to use, which in turn is generally easier than deciding who to intubate, which in turn is generally easier than deciding precisely when to intubate...”

-Ron Walls, MD
Five questions

- Do we need the airway now? Or time for other planning?
- Will they be easy to BVM?
- Will they be an easy intubation?
- Will a supraglottic airway work?
- Will they be easy to crich?
Airway Management

The Ten(+1) Commandments

- Remain Calm
- Have a organized game plan (have enough players)
- BLS before, during and after ALS
- Pre-oxygenate (gives you time to not rush the intubation)
- Keep track of time (with a watch, do not guess)
- Don’t fail to bail, go back to BVM
- If you can’t ventilate - Intubate
- If your first attempt is unsuccessful – Do something different
- If you can’t Intubate - Ventilate
- If you can’t Ventilate or Intubate - Rescue
- Practice, Practice, Practice
Airway Management

Tricks-of-the-Trade

- Use the proper tube size
- Pre-oxygenate the patient prior to an attempt
- Premedicate with appropriate medications
- Have enough personnel available
- Attempt only 3 times total if that fails rescue
- Practice, Practice, Practice
Airway Management

Visualization

- In the perfect world
Airway Management

Visualization

Cricoid Pressure

External Laryngeal Manipulation
Airway Management

Vizualization

- Line the ears up with the sternum
- Something behind the occiput
Airway Management

Vizualization

- Morbidly obese patients
Airway Management

Visualization

- POC - POM
- ELM
Airway Management

Alternate Techniques

- Endotracheal Tube Introducer
- A great second attempt device
LMA Supreme

- Better than the old one
- Good for EMS
- Firm tip so no flop over
- Built in bite block
- Other types also
King Airway

- Rescue airway
- Not blind for us
- Most of the time
Airway Management

Rescue Airways

- Combitube
Video laryngoscopes

- CMAC
- Glide Scope
- Others
Airway Management

Rescue Airways

- Needle Cricothyrotomy
Advanced Airway Management

Rescue Airways

- Needle Cricothyrotomy
  - Transtracheal jet insufflator
Airway Management

Rescue Airways

- Surgical Cricothyrotomy
Airway Management

Lessons Learned

- Multiple attempts (limit 3 less than 1% success after that)
- Failure to be prepared
- Failing to anticipate a difficult airway
- Rushing the intubation
- Equipment failure (Suction)
- Not changing anything in between intubation attempts
- Intubating patients instead of treating the underlying cause
- When in doubt pull it out
Rapid Sequence Induction

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Goals for Today

- List indications for rapid sequence induction (RSI).
- Identify equipment and supplies needed to perform RSI.
- Discuss the various types of pharmacological agents utilized in RSI.
- Discuss risks/pitfalls of RSI.
What?

- Use of chemicals to paralyze and sedate patients to facilitate endotracheal intubation
Who?

- Patients with decreased respiratory effort
- A presumed clinical course that will need it
- Patients at risk of airway compromise
  - Decreased $O_2$
  - Increased $CO_2$
  - Aspiration
- Closed Head Injured (CHI) patients
  - Control ventilation
RSI Considerations

- Respiratory failure
- Loss of protective airway reflexes (not gag) (Look for spontaneous swallowing)
- Glasgow coma score of 8 or less
- Severe head trauma
- Asthma or respiratory illness
- Spinal cord injuries
- Burns to the face or airway
- Combative patients
- Status epilepticus
Why?

- Protect airway (aspiration)
- Provide oxygenation and ventilation
- Control ventilation
- Protect and/or treat ICP
- Increase success rate
When?

- When indicated
- Scene vs. vehicle
- BLS “OK” if working
How?

- BLS is always “OK” if working
- The seven “P’s”
  - Preparation
  - Preoxygenate
  - Pretreat
  - Time out
  - Paralysis
  - Protect
  - Place
  - Post-intubation
Preparation

- Assess for the difficult airway (LEMON)(SHORT)(MOANS) (RODS)
  - L = Look externally
  - E = Evaluate the 3-3-2
  - M = Mallampati
  - O = Obstruction?
  - N = Neck mobility

- Plan approach
- Assemble drugs and equipment
- Establish access
- Establish monitoring
Preoxygenation

Pre-oxygenation is critical in airway management

- 100% oxygen for five minutes (spontaneous breathing)
- 8 vital capacity breaths if underventilating

Provides “reservoir” of oxygen for apnea time

Can augment this with high flow oxygen via Nasal cannula at 12-15L/Min leave on during attempts
Pretreatment

- Pretreatment = “LOAD”
  - L = Lidocaine
  - O = Opioid
  - A = Atropine
  - D = Defasciculation
TIME OUT

- Is the patient ready
- Am I ready
- Are the meds and equipment ready
- What is my next step if this doesn’t work
- When will I stop and bag them again
- This is the plan for the “missed airway”
Paralysis with Induction

- Neuromuscular blocker IV push
- Rocuronium
- Induction agent IV push
- Etomidate for most
- Ketamine for sepsis, asthma, hypotensive
Protection

- Sellick maneuver
- Position patient (sniffing)
- No bagging unless $\text{SpO}_2 < 95$
  - Why?
Placement

- The Six ETT Checks
  - Visualize
  - EtCO2
  - Lung sounds
  - Chest rise/fall
  - Mist in the tube
  - Pulse oximetry
Post-Intubation Management

- Secure the tube
- Administer longer acting sedation
Dangers/Pitfalls

- Tube placement can’t be obtained
  - Rare
  - Rescue devices
- Medication reactions
  - Must know your medications
  - Hypotension
  - Etomidate and adrenal suppression
  - Decrease in respiratory drive
Questions