# Advanced Airway Management

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Thanks to Bill Landon for original presentation material

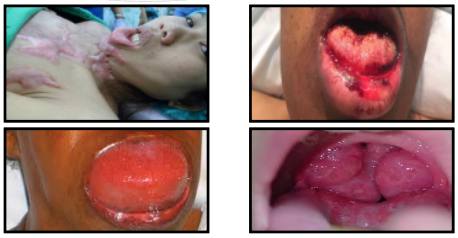
1

## Objectives

- Discussion of airway anatomy and assessment
- Review steps for advanced airway management
- Discuss difficult airway management, surgical airway
- Review RSI vs DSI vs intubation avoidance

2

## Life Can Be Difficult When You Are A Prehospital Airway Manager!



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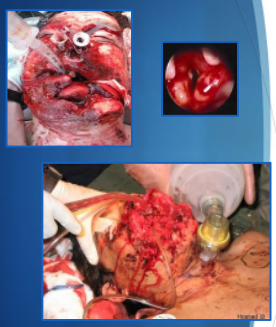

Things that make you go hmmm . . .

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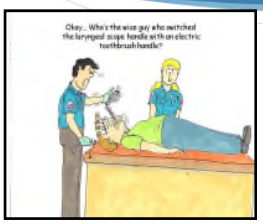
People expect us to know things. I mean, c'mon, sometimes we may be having an "off day" right?



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And Who Could Forget Our Friend Murphy?

**Murphy's Laws of Airway Managment**

- Anything that can go wrong, will go wrong. Usually all at the same time.
- The most important piece of equipment will either be lost or will break in the middle of the procedure.
- If you're confident about an intubation, don't worry, that will pass quickly.
- The severity of hypoxemia is proportional to the Mallampati class multiplied by the gastric residual volume.

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## Uh…Uh…Uhh…Uhhh…

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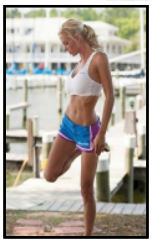
## There are the patients we want to see . . .



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## But the patients we usually see!


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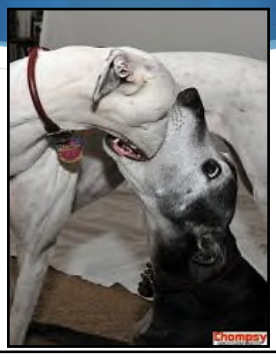
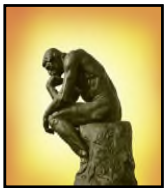
In reality, most times managing an airway does not have to be difficult if you use your head,




10

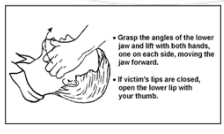
## Follow a few basic rules

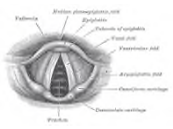
- Stay calm and maintain your focus.
- Hope for the best but prepare for the worst.
- Have a plan (training & algorithms)
- Make sure everyone is aware of your plan.
- Have an alternate plan.
- Remember the basics.

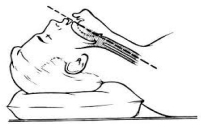


11

## And Recall Your Training



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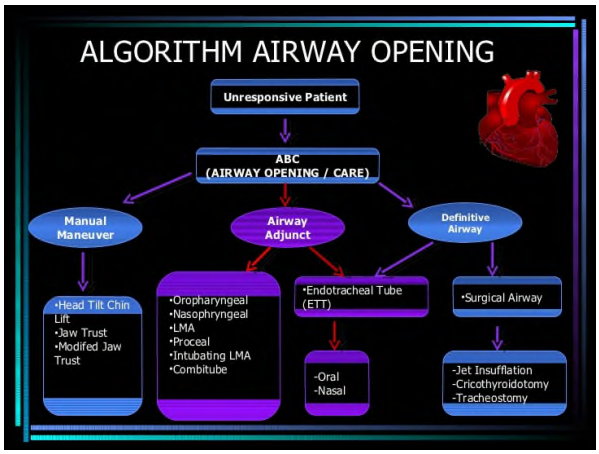



13

Difficult Airway Factors

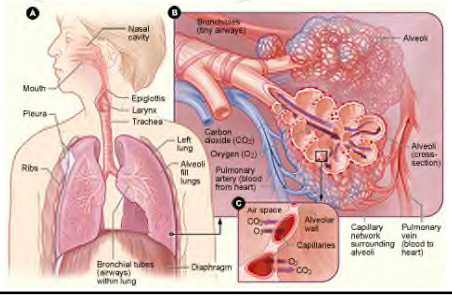
- Morbid obesity
- Beard
- Immobility
- Poor dentition
- Lung & CV disease
- Edematous
- Chronic oxygen use

14

Difficult Airway Management is a TEAM SPORT!

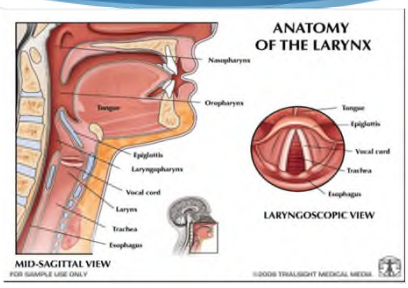

15

## Our Real Focus!



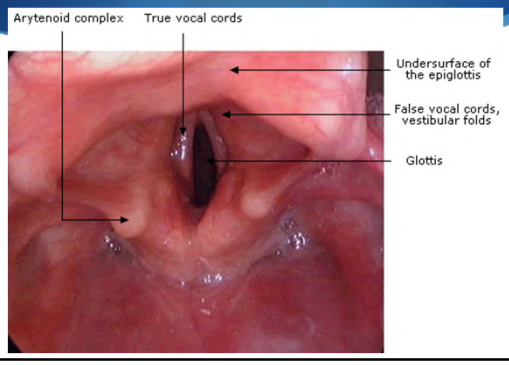

16

## Upper Airway




17

## Larynx & Glottic Structures




18

## Larynx Structures

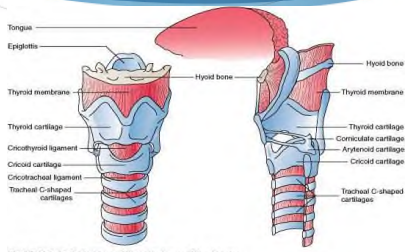
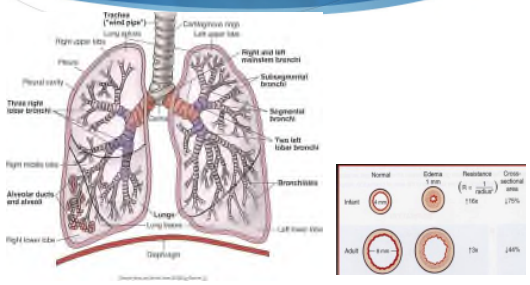



**FIGURE 8-39** Anterior and lateral views of the larynx.
(From Hicks GH: Cardiopulmonary anatomy and physiology, Philadelphia, 2000, WB Saunders.)

19

## Lower Airways




20

## Respiratory failure

- Type I – O2 problem
  - PNA, ARDS
- Type II – CO2 problem
  - COPD, asthma, CHF
  - Compensatory mechanism for metabolic process
- Type III – airway problem
  - Edema, AMS (central), trauma

21

## Why is This Important?

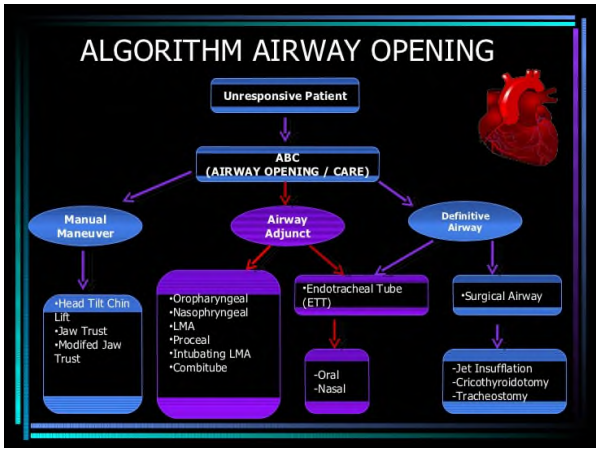
Because we need to know WHEN and HOW to act and the goals we are trying to achieve with our intervention

- Positioning?
- Suction?
- Nasal airway? (NPA)
- BVM ventilation?
- Oral airway? (OPA)
- Intubation?
  - Oral vs nasal
- Med-assisted ETI?
- DSI? / RSI?
- Mechanical ventilation?

22

## Airway Management Does **NOT** Mean Intubation


23




24

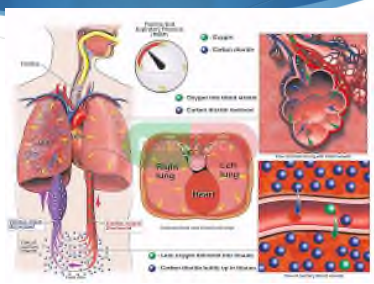
## Correcting Hypoxia (Type I)

- Supplemental oxygen
  - Room air FiO2 = ?
  - 1 lpm nasal cannula FiO2 = ?
  - 6 lpm nasal cannula FiO2 = ?
  - 15 lpm "100% NRB" FiO2 = ?
  - High flow nasal cannula FiO2 = ?
  - BiPAP/CPAP/mechanical ventilatory support FiO2 = ?
- SaO2 vs paO2
  - CaO2 = 1.34 (Hgb x SaO2) + PaO2(0.003)

25

## Correcting Hypoxia

- PEEP
- DO2



26

## Correcting ventilation (Type II)

- Central vs peripheral (lung or nerve/muscle)
  - Narcan? Positioning?
- Compensatory vs primary
  - Correct underlying problem quickly?
- BVM vs NIV vs intubation

27

## Be an Expert at BVM Ventilation

Sizing, adult vs pediatric technique, proper rate, volume, and tempo

28

## Adjuncts

29

## Non-invasive strategies

30

## What is the anticipated clinical course?

- Most patients that require intubation have one or multiple indications discussed above, however. . .
- There is one group of patients that may not immediately exhibit inability to maintain airway patency, loss of protective reflexes, or inability to oxygenate or ventilate.
- **Those patients whose clinical course is expected to deteriorate, or showing downward trending appearance should be strongly considered for "pre-emptive" and proactive intubation.**

31

## Expected Clinical Deterioration

**Those patients who are expected to deteriorate due to worsening clinical condition or fail to oxygenate because of catastrophic illness or injury should be intubated early!**

**EXAMPLES:**

- **Stab wound to the neck with a hematoma**
- **Airway burns with signs of impending airway compromise.**
- **Traumatic brain injuries with signs of herniation.**
- **Sepsis with respiratory fatigue and ARDS.**

32

## Case Study
## Motorcycle vs. SUV

33

## SUV Wins

- Patient is awake and alert
- C/O "Neck Pain"
- Audible stridor
- Minimal visible bleeding
- 172/86, 110, 22, 94% $SpO_2$
- Subcutaneous air in neck
- **THOUGHTS?**

34

## Case Study #2
## Fall From Roof

- GCS 10 ($E_3$, $V_3$, $M_4$)
- Bleeding from ears and mouth
- Not handling secretions well
- 168/112, 56, 8, $SpO_2$ 89%
- Pupils R-6mm, L-4mm
- Intermittent unconsciousness
- **THOUGHTS?**

35

## Definitive Airway Control
### How Do We Get There Successfully?

36

## Follow a Few Basic Rules

- Stay calm and maintain your focus.
- Hope for the best but prepare for the worst.
- Have a plan (training & protocols)
- Make sure everyone is aware of your plan.
- Have an alternate plan.
- Remember the basics.

37

## Indications For Intubation

The decision to intubate should be based on three fundamental clinical assessments:

1. **Is there a failure of airway maintenance or protection?**
2. **Is there a failure of ventilation or oxygenation?**
3. **What is the anticipated clinical course?**

Manual of Emergency Airway Management, 4th Edition
Walls, RM, Ed. Philadelphia, Lippincott 2012

38

## Is there a failure of airway maintenance or protection? (Type III)

- Conscious and alert patients use upper airway musculature and protective reflexes to protect from aspiration and maintain airway patency.
- Clear, unobstructed phonation is strong evidence of intact protective reflexes maintaining a patent airway.
- As a rule, any patient who needs an adjunctive airway placed needs his/her airway protected.
- **The gag reflex does not correlate well with airway protection and is of little clinical value when assessing the need for intubation. ENT studies show swallowing to be much more predictive of ability to manage/maintain airway patency.**

39

## Is there a failure of ventilation or oxygenation?

- Oxygenation of the vital organs (brain, heart, lungs) is the primary function of the respiratory system.
- If your patient is unable to ventilate or oxygenate sufficiently despite use of supplemental oxygen and adjuncts, then intubation is indicated.
- EXAMPLES:
  - COPD exacerbation with upward trending $EtCO_2$ - why?
  - Severe pulmonary edema after CPAP/BiPAP- why?
  - Severe hypovolemic shock with inability to maintain perfusion- why?
  - Pneumonia with sepsis – why?

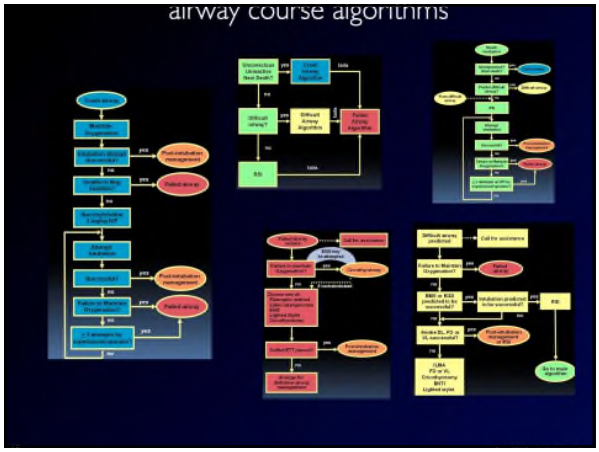
40

## Now We Have Decided to Intubate, How Do We Do It?

**Using the Airway Algorithms**

- Universal Airway Algorithm
- Difficult Airway Algorithm
- Crash airway Algorithm
- Failed Airway Algorithm
- RSI Algorithm

41

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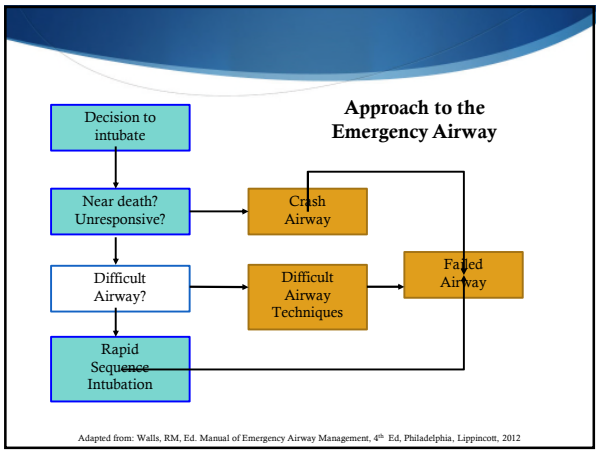



43

## Decision to Intubate

- ❑ **Airway maintenance**
- ❑ **Oxygenation**
- ❑ **Ventilation**
- ❑ **Corrective intervention**
- ❑ **Expected course**

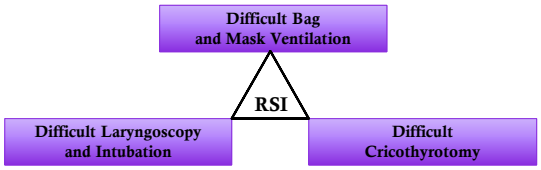
44

## Decision to Intubate: Considerations

- ❑ Operator experience (most experienced laryngoscopist)
- ❑ Setting: prehospital vs in-clinic/hospital
- ❑ Potential for a difficult airway
  - ❑ 3-3-2 evaluation
  - ❑ L.E.M.O.N.
  - ❑ M.O.A.N.S.
- ❑ **Never remove someone's ability to breath if you cannot ventilate them, or think you can't!**

45

## The Difficult Airway Triangle




Sakles's triangle

46

## Difficult Bag & Mask Ventilation
### Assessment of Difficult BVM


FIGURE 1A. Patient with super morbid obesity with large neck and a beard

47

## Assessment of Difficult BVM

- **Consider the difficulty of BVM ventilation before administering medications!**
- Everyone has a full stomach in our world.
- Have all equipment out and ready before you start.
- Five predictors of difficult BVM: facial hair, obesity, poor dentition or edentulous, elderly (> 55 yrs), snoring or sleep apnea history.

48

## Difficult BVM: MOANS

**M** ask seal

**O** besity / obstruction

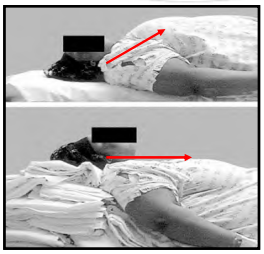
**A** ge > 55

**N** o teeth

**S** tiff lungs (COPD, asthma, ARDS)

49

## Positioning the Obese Patient



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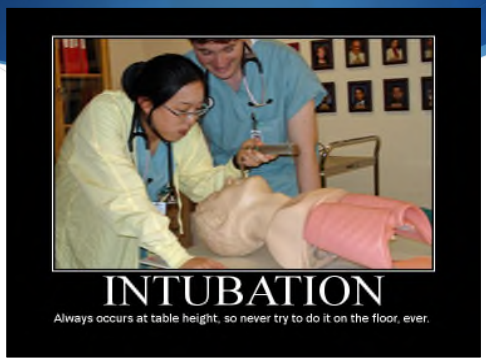
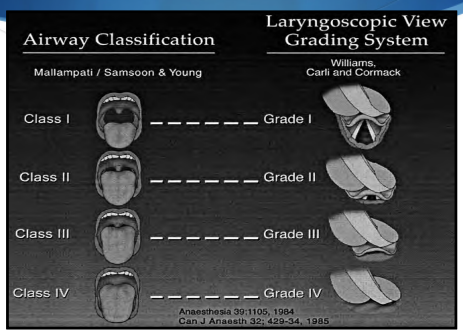



51

## Difficult Airway Possibly?

52

## Difficult Laryngoscopy & Intubation




53

## Difficult Laryngoscopy & Intubation

54

## Difficult Intubation Assessment

- Cormack-Lehane eval is cumbersome and does not often work in our chaotic situations. Requires look with laryngoscope.
- Too little, too late
- We are pre-hospital providers and need an evaluation system that is simpler, faster, and easier.

55

## Let's Talk LEMONS!

**"LEMON" LAW of Evaluating Difficult Airway**

**L** ook externally

**E** xamine (3-3-2)

**M** allampati grade

**O** bstruction

**N** eck mobility

56

## LEMON: Look

Simple visual inspection often reveals obvious potential difficulties.

57

## LEMON: Examine 3-3-2

Open mouth should be able to accommodate three fingers

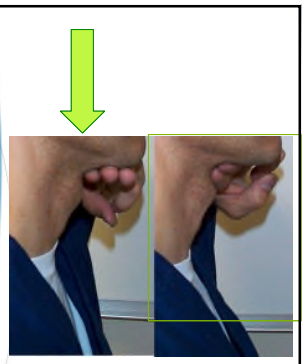
Mouth opening for visualization of glottis

58

## LEMON Examine 3-3-2

Measure the mandible. You should be able to fit 3 fingers between the mentum and the hyoid bone.

Tongue displacement

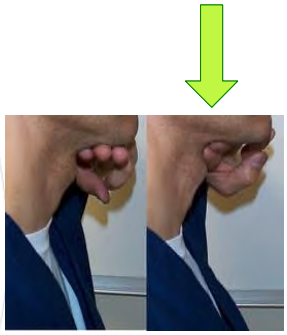


59

## LEMON Examine 3-3-2

Assess the position of the larynx. You should get 2 fingers between the thyroid cartilage and the mandible

Larynx in relation to the base of the tongue.



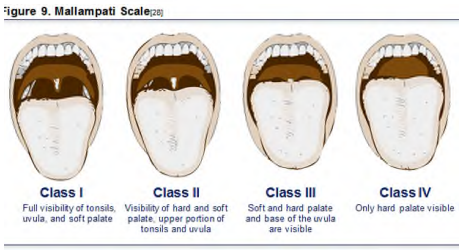
60

## Micrognathia

What's wrong with this picture?

61

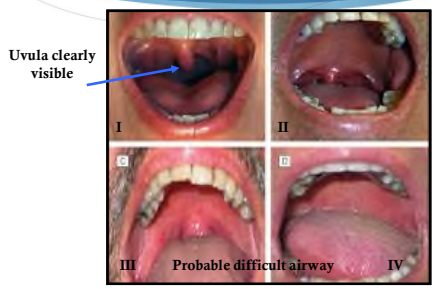
## LEMON: Mallampati




62

63

## Mallampati I - IV




64

## LEMON: Obstruction?

- Location of obstruction
- Fixed or mobile?
- Speed of progression?

65

## LEMON: Obstruction


66

## LEMON: Neck Mobility

How well can the patient extend and flex their neck?

Spinal immobilization / C-collar?
Remove anterior portion of c-collar for intubation

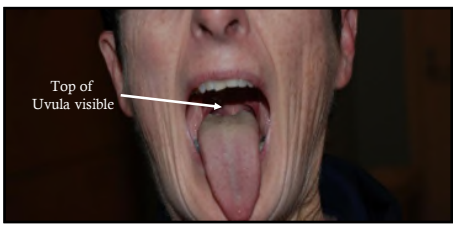
Arthritis / cervical fusions

67

## What is Your Assessment?

68

## Assessment Now?

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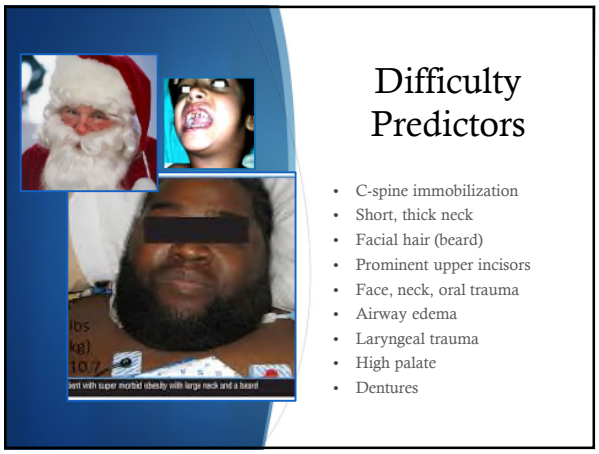
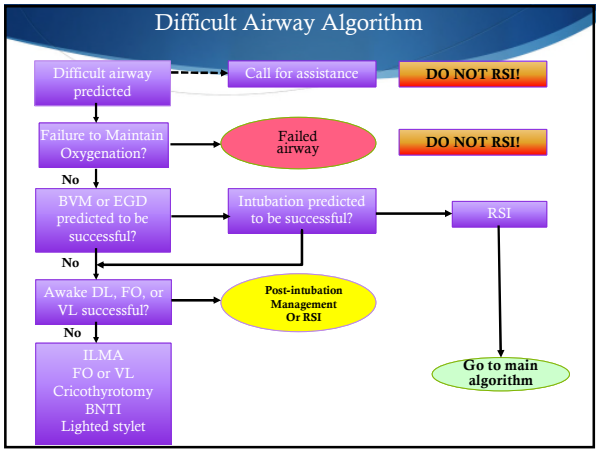
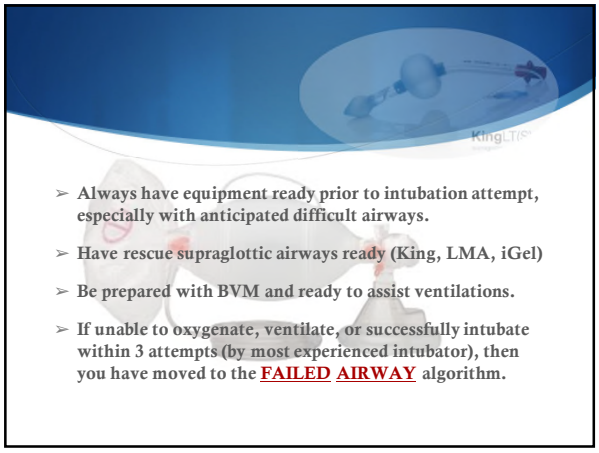

Difficulty Predictors
C-spine immobilization
Short, thick neck
Facial hair (beard)
Prominent upper incisors
Face, neck, oral trauma
Airway edema
Laryngeal trauma
High palate
Dentures

70


Difficult Airway Algorithm
Difficult airway predicted
Call for assistance
DO NOT RSI!
Failure to Maintain Oxygenation?
Failed airway
DO NOT RSI!
No
BVM or EGD predicted to be successful?
Intubation predicted to be successful?
RSI
No
Awake DL, FO, or VL successful?
Post-intubation Management Or RSI
No
ILMA
FO or VL
Cricothyrotomy
BNTI
Lighted stylet
Go to main algorithm

71


Always have equipment ready prior to intubation attempt, especially with anticipated difficult airways.
Have rescue supraglottic airways ready (King, LMA, iGel)
Be prepared with BVM and ready to assist ventilations.
If unable to oxygenate, ventilate, or successfully intubate within 3 attempts (by most experienced intubator), then you have moved to the FAILED AIRWAY algorithm.

72

## Failed Airway Algorithm

- **ALL AIRWAYS END IN ONE OF TWO WAYS:**
  - **Successful intubation**
  - **Failed airway algorithm**

- **This is the EXPERIENCED bad airway**
- **It is important to understand that to experience a failed airway does not mean you have failed the patient!**

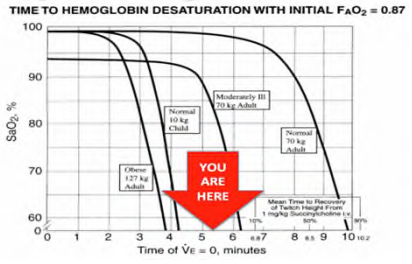
73

## Failed Airway Causes

- Unable to intubate patient within 3 attempts by most experienced laryngoscopist.
  - Three attempts total. Not 3 each! What does your protocol say?
  - An attempt is considered from the time the laryngoscope tip enters the mouth and is withdrawn for any reason.
- Unable to maintain $SpO_2$ > 90%

74

## Desaturation Curve

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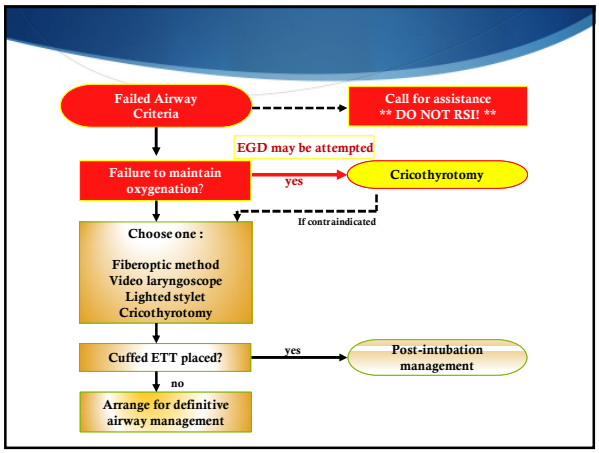
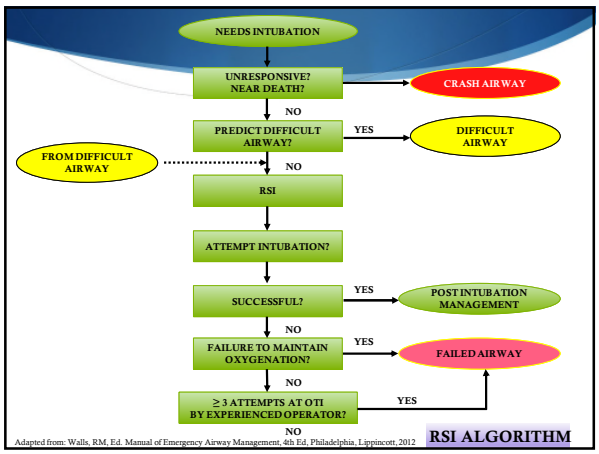



76

## Key Point of Failed Airway

- **Cricothyrotomy is the end result.**
  - A second practitioner MAY ATTEMPT a supraglottic airway while the primary person is setting up to surgically cric the patient, but the cricothyrotomy should not be delayed for ANY REASON!

77

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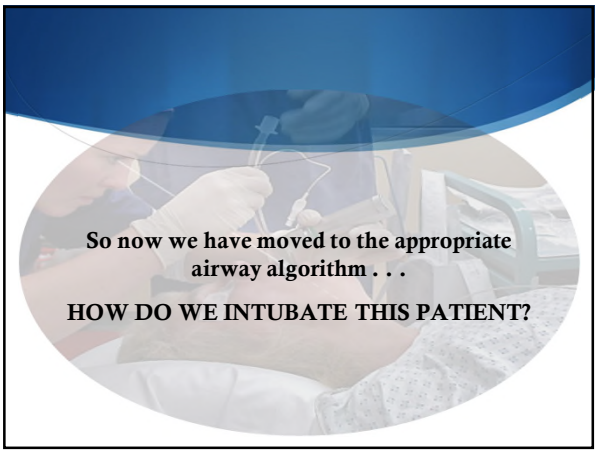
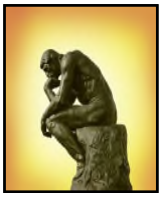


**So now we have moved to the appropriate airway algorithm . . .**

**HOW DO WE INTUBATE THIS PATIENT?**

79

## Follow a Few Basic Rules



- ❑ Stay calm and maintain your focus.
- ❑ Hope for the best but prepare for the worst.
- ❑ Have a plan. Your protocols will guide you.
- ❑ Make sure everyone is aware of your plan.
- ❑ Have an alternate plan.
- ❑ Keep in mind the basics.

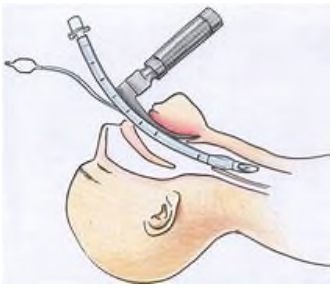
**Remember that inability to intubate is not a failure! Inability to ventilate and oxygenate is!**

80

## The Basics

- ◆ **Ventilation and oxygenation are the TOP priorities.**
- ◆ Patients do not die or suffer brain damage because you do not or cannot intubate them . .
- ◆ Patients die or suffer brain damage because you cannot or do not ventilate and oxygenate them.

81



82

## The Seven P's of RSI

Timed Sequence of Events for a Healthy 80-kg Patient

| | | |
|---|---|---|
| 1. | Preparation | Zero minus 10 minutes |
| 2. | Preoxygenation | Zero minus 5 minutes |
| 3. | Pretreatment | Zero minus 3 minutes |
| 4. | Paralysis with induction | Zero |
| 5. | Positioning | Zero plus 20-30 seconds |
| 6. | Placement with proof | Zero plus 45 seconds |
| 7. | Postintubation management | Zero plus 1 minute |

83

## It is important to mention the often low success rates of prehospital RSI,

sometimes 50% of first pass success, especially with a compressed timeline

84

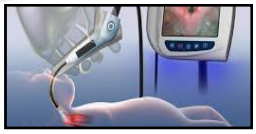
## Preparation

- Thorough assessment for difficulty of intubation
- Monitoring equipment
- Checklist, checklist, checklist
- IV access x 2
- Equipment checked and prepped
- You and your partner synched

85

## Video Laryngoscopy

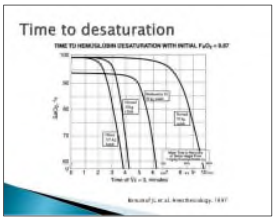
Which device do you use and are you proficient with it?

86

## Preoxygenation

- No bag-mask ventilation whenever possible
- Nitrogen washout, increasing functional residual capacity (FRC) 30 ml/kg
- NC at 10+ lpm + NRB
- 3 minutes or greater
- 8 vital capacity breaths if pt. able




87

## Preoxygenating Morbidly Obese Patients

- 25%+ elevation head up position for the entire procedure
- Oxygenation with a high flow nasal cannula 10+ LPM maintained till ETT position is confirmed with capnography may increase desaturation time < 92% to 3.5 minutes.


88

## New(er) Trends in Airway Practice

- **Passive oxygenation**
  - Placing a NRB at 15 LPM on your patient a few minutes prior to your intubation attempt.
  - Then place a nasal cannula at 15-25 LPM while you are intubating and until the ETT is placed, verified with capnography, and secured.
  - Minimal amounts of PEEP /FRC are established, and studies validate the lengthening of desaturation times by up to two minutes.

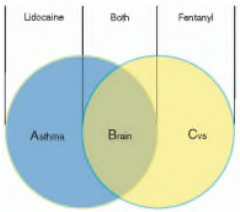
89

## Passive Oxygenation

90

## Pretreatment

- **A**sthma (reactive airway disease)
- **B**rain (elevated ICP)
- **C**ardiovascular (ischemia, vascular disease, aorta, ICH)
- Meds administered 3 minutes prior to induction/paralysis.




91

## Paralysis with Induction

- **Rapid IVP of induction agent**
  - **Etomidate**
  - **Ketamine***
- **Followed immediately by rapid IVP of NMBA**
  - **Succinylcholine**
  - **Rocuronium**

- Be prepared for untoward effects from rapid administration of induction agents* with critical and hypotensive patients.
- Sepsis, extremely dyspneic, and hypotensive patients may likely deteriorate!
  - Consider preparation and use of push-dose pressors in these situations
  - Consider Delayed Sequence Intubation (DSI) to achieve MAP > 80 mmHg

92


93

**Definition:**

**"Rapid sequence intubation (RSI) is the administration, after preoxygenation, of a potent induction agent followed immediately by a rapidly acting neuromuscular blocking agent to induce unconsciousness and motor paralysis for tracheal intubation."**

Ron M. Walls, MD, Michael F. Murphy, MD
Manual of Emergency Airway Management, Fourth Ed, Lippincott Williams & Wilkins, 2012

94

In other words, the purpose of RSI is to render the patient unconscious and paralyzed and then to intubate the trachea without the use of bag-mask ventilation (whenever possible*), which may cause gastric distention and increase the risk of aspiration.

Ron M. Walls, MD, Michael F. Murphy, MD
Manual of Emergency Airway Management, Fourth Ed, Lippincott Williams & Wilkins, 2012

95

## If Only It Was That Simple!

96

# When to Consider RSI

Let's compare these next few slides to "Medication-assisted" intubation

- When an emergency intubation is indicated and the patient does not have difficult airway features that contraindicate use of NMBA's.
  - L.E.M.O.N. assessment
  - Large tongue, small mandible, large teeth, short neck
  - Obesity (BMI does not correlate to predict difficulty)***
  - Small mouth opening***
  - Poor 3-3-2 assessment***
  - Obstruction: muffled voice, difficulty swallowing secretions, stridor, sensation of dyspnea

97


# MEDS

- Learn your medication profiles of action, indications, and contraindications.
- Have all meds drawn up and labeled prior to needing them.
- Consider patient weight, age, and co-morbidities when using any medication.
- Remember- **ALL medications and interventions have side effects.** Know what they are and how that will affect your patient and what you are trying to achieve.

98

# Fentanyl


**Schedule II synthetic opiate**

**Onset:** **45-60 seconds**

**Duration:** **30-60 minutes**

**Dosing:** **0.5-3.0 mcg/kg**

**Pros: Sympathetic attenuation, short acting, minimal histamine release.**

**Cons: inconsistent hemodynamic effects, may cause bradycardia in compromised patients, enhanced respiratory depression in pediatrics and geriatrics.**

**AVOID LARGE DOSES IN DECOMPENSATED SHOCK**

99

# Ketamine

Schedule III anesthetic

- Analgesic, anesthetic, and amnestic effects (cortex & limbic systems)
- Dissociative effects
- Stimulates sympathetic nervous system. DOES NOT INCREASE ICP OR BP
- Consider concomitant use of benzodiazepines

| | |
|---|---|
| Onset: | 20-40 seconds |
| Duration: | 10-20 minutes |
| Dosing:**** | |
| Pain | 0.5-1.0 mg/kg |
| Induction | 1.0-2.0 mg/kg |

**Pros:** Dissociative anesthesia, relaxes bronchial smooth muscle, use in hemodynamically unstable and septic patients is beneficial to MAP


**Cons:** Hypotension in doses > 1.5 mg/kg in catecholamine depleted patients, stimulates sympathetic nervous system, bronchial secretions, hallucinations possible.

100

# Ketamine

**Regional Protocol Indications**

- Short-term management of pain and anxiety related to injury, immobilization, patient movement, or manipulation of injured extremities.
- Sedation, behavioral emergencies (IM), and med-assisted ETI.

| | |
|---|---|
| Onset: | 45-60 seconds |
| Duration: | 5-10 minutes IV |
| **Pain** | 0.5-1.0 mg/kg IV/IO/IM/IN repeat q 5-10 min |
| **Sedation** | 1 -2 mg/kg 4 mg/kg IM repeat q 10 prn |

**Pros:** Dissociative anesthesia, relaxes bronchial smooth muscle, use in hemodynamically unstable and septic patients is beneficial to MAP


**Cons:** Hypotension in doses > 1.5 mg/kg in catecholamine depleted patients, stimulates sympathetic nervous system, bronchial secretions, hallucinations possible.

101

# Medication Assisted Intubation

Washoe County Regional Protocols

- **Preoxygenate**
- **Prepare**
- **Cardiac monitor**

**CONTRAINDICATIONS?**

For analgesia or ICP attenuation: FENTANYL 1-3 mcg/kg IV/IO

Sedation and Induction:

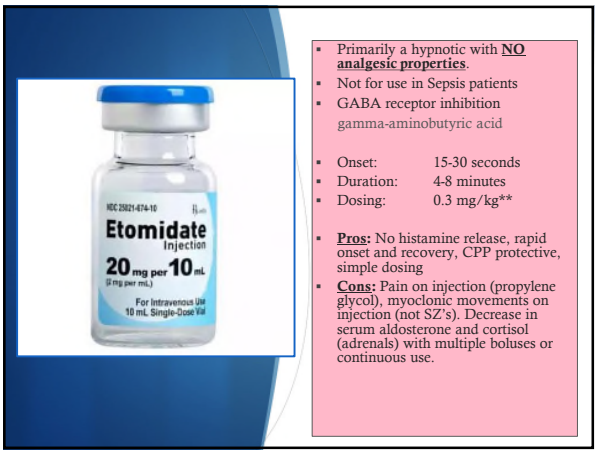
- **Ketamine 1-2 mg/kg IV/IO**
- **Midazolam 2-5 mg IV/IO**
- Etomidate 0.3 mg/kg IV/IO

Ad patient jaw relaxes, proceed with intubation
Consider cricoid pressure (release if vomiting)

If inadequate relaxation is present:

- **Ketamine—proceed to Midazolam 2-5 mg IV/IO**
- **Midazolam dose may be repeated at 2-5 mg IV/IO**
- **Etomidate 0.3 mg/kg IV/IO**

102




- Primarily a hypnotic with **NO analgesic properties**.
- Not for use in Sepsis patients
- GABA receptor inhibition
  gamma-aminobutyric acid

- Onset: 15-30 seconds
- Duration: 4-8 minutes
- Dosing: 0.3 mg/kg**

- **Pros:** No histamine release, rapid onset and recovery, CPP protective, simple dosing
- **Cons:** Pain on injection (propylene glycol), myoclonic movements on injection (not SZ's). Decrease in serum aldosterone and cortisol (adrenals) with multiple boluses or continuous use.

103


**Nondepolarizing NMBA**

Antagonistic agent which blocks acetylcholine (ACH) at the motor endplate.

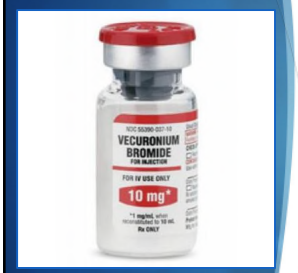
Preferred for RSI due to similar duration profile to SCh.

**Onset**: 45-60 seconds
**Duration**: 40-60 minutes
**Dosing:** 1.0 mg/kg

**Pros**: Consistent onset of paralyzation, no fasciculations, no K+ release, so may not exacerbate rhabdomyolysis, hyperkalemia, etc.

**Cons:** longer onset & duration of action than SCh, may cause hypotension in larger doses, bronchospasm (not common).

104




**Nondepolarizing NMBA**

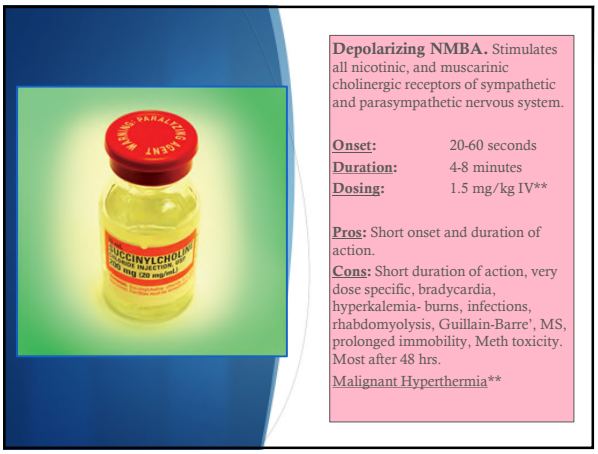
Antagonistic agent which blocks acetylcholine (ACH) at the motor endplate. Good use for continued paralysis.

**Onset:** 90-120 seconds
**Duration:** 40-60 minutes
**Dosing:** 0.1 mg/kg

**Pros:** No fasciculations or associated hyperkalemia

**Cons:** Prolonged duration of action, Myasthenia Gravis patients may experience extended duration of paralyzation for several hours

105




**Depolarizing NMBA.** Stimulates all nicotinic, and muscarinic cholinergic receptors of sympathetic and parasympathetic nervous system.

| | |
|---|---|
| **Onset:** | 20-60 seconds |
| **Duration:** | 4-8 minutes |
| **Dosing:** | 1.5 mg/kg IV** |

**Pros:** Short onset and duration of action.

**Cons:** Short duration of action, very dose specific, bradycardia, hyperkalemia- burns, infections, rhabdomyolysis, Guillain-Barre', MS, prolonged immobility, Meth toxicity. Most after 48 hrs.

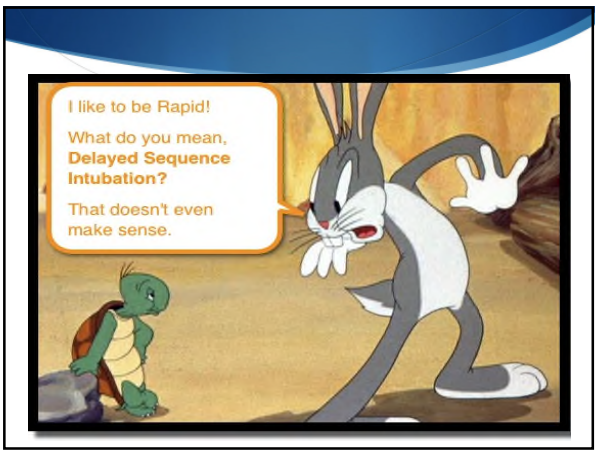
Malignant Hyperthermia**

106

## New(er) Trends

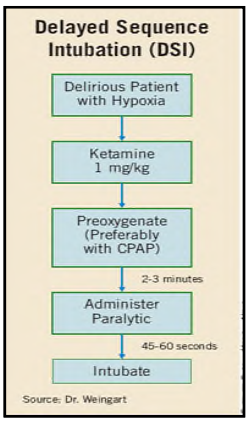
- **Delayed Sequence Intubation (DSI)**
  - Many patients may require some sort of resuscitation and/or prior oxygenation prior to any sort of intubation or RSI/med-assisted attempt.
  - This may be due to chronic lung disease, trauma, or combative behavior where they will not tolerate oxygenation with a NRB or NC immediately prior to intubation.
  - A dose of Ketamine at 20-30 mg IVP will put them into a dissociative state, allowing pre-oxygenation with CPAP before intubation.***
  - RSI or med-assisted intubation is then performed as usual.

107




108

Delayed Sequence Intubation

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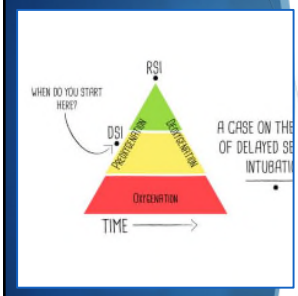



Delayed Sequence Intubation

110

## Positioning

- Spinal immobilization precautions- open the collar
- Obesity
- Peds- sniff position


111

## Placement with Proof

- 20-40 seconds after Ketamine
- Check jaw flaccidity. Masseter muscle is last to relax.
- Intubate
- If adequate preoxygenation was achieved, you should have several minutes of safe apnea time.


112

## Post-intubation Management

- Confirm proper depth and secure the ETT with a commercial device. Check after every move.
- Secure head in neutral midline position. Elevate 15-30 degrees as necessary, especially w CHI
- Initiate mechanical ventilation
- Administer sedation q 10 minutes or prn

113

## Post-intubation Management

- Hypotension following intubation and ventilation may occur due to combined effects of induction meds and increased intrathoracic pressure.
- While it may be temporary or respond to fluids, always consider a more significant cause.
- **More than 10 seconds of hypotension with MAP < 90 mmHg or hypoxia doubles mortality in brain trauma patients!**
- Remember restraints, analgesia, and continuous sedation.

114

## Desaturation Considerations

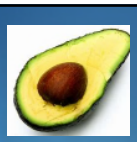
- Be prepared, use most experience intubator and PREOXYGENATE!
- Term pregnant women desaturate < 95% in less than 3 minutes compared to non-pregnant. Positioning does not favorably affect the duration of apneic oxygenation in term pregnancy.
- Obese patients are similar, and desaturate quickly! Why?

115

## Causes of Post-RSI Hypotension

- **Pneumothorax**
- **Decreased venous return**
- **Induction and sedation agents - iatrogenic**
- **Cardiogenic causes: AMI, ischemia, poor baseline condition, synergistic effect of induction meds with cardiac meds.**

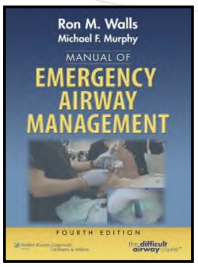
116



## Ventilator management

117

# Discussion?






118

# Thank-you for your attention.

CARE FLIGHT

119