**EM Basic- Airway**

(This document doesn’t reflect the views or opinions of the Department of Defense, the US Army or the SAUSHEC EM residency, © 2011 EM Basic, Steve Carroll DO. May freely distribute with proper attribution)

**Why we intubate**

1) **Can’t protect the airway** (GCS <8, obtunded)

2) **Can’t maintain oxygenation/ventilation**

-O2 sat <90 with non-rebreather mask

-Patients who are tiring from increased work of breathing

-Severe asthma/COPD (airway obstruction)

3) **Expected Clinical Course**

- Drunk and rowdy trauma patient (can’t cooperate)

- Going to CT scanner with a tenuous airway

- Pain control- patient with multiple long bone fractures

going to the OR anyway

4) **Airway obstruction**

-Deep space neck infection/mechanical obstruction

**Predicting a difficulty airway**- ED airways = difficult airways automatically

**EVALUATE LEMON LAW- if positive, then airway is more difficult**

**L**ook- incisors or buck teeth, dentures, obese?, beard

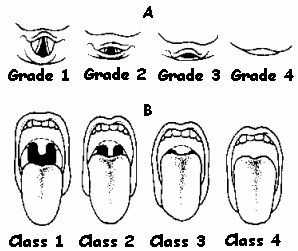
**E**valuate 3-3-2

3 finger breadths- open mouth

2 finger breadths- mandible to neck

2 finger breadths- neck to thyroid

**M**allampati Score- look inside mouth



**O**bstruction- foreign body or abscess, tumor, epiglottitis, stridor

**N**eck mobility- in c-collar?, any limitation in neck movement?

**PREPARATION FOR INTUBATION**- most important step

**PEARL-** Get the patient on 100% oxygen (O2) via non-rebreather (NRBM) ASAP, use Bi-PAP/CPAP to get oxygenation as high as possible if needed

**PEARL-** BVM with self-refilling reservoir doesn’t provide oxygen unless you are squeezing it (don’t just place it on the patient’s face)

**SOAP-ME**

**S**uction- at least one working suction, place it between mattress and bed

**O**xygen- NRBM and BVM attached to 15 LPM of O2

**A**irways- 7.5 ET tube with stylet fits most adults, 7.0 for smaller females, 8.0 for larger males, test balloon by filling with 10 cc of air with a syringe

-**Stylet**- placed inside ET tube for rigidity, bend it 30 degrees starting at proximal end of cuff

-**Blade**- Ma**c** 3 or 4 for adults- **c**urved blade

Mi**l**ler 3 or 4 for adults- **straight** blade

**-Handle**- attach blade and make sure light source works,

**DON’T** keep it attached until you are ready to intubate

**-Backups­- ALWAYS have a surgical cric kit available!**

have glidescope, LMA and bougie at bedside

**P**re-oxygenate- 15 LPM NRBM (should probably be first thing)

**M**onitoring equipment/**M**edications

-Cardiac monitor, pulse ox, BP cuff opposite arm with IV

-Medications drawn up and ready to be given

**E**nd Tidal CO2- out of the package, keep sticker in place until the patient is intubated

**Premedication**- not used frequently except for some situations

-**Head injury**- Lidocaine 1.5 mg/kg IV 3-5 minutes prior to intubation

-Theoretically decreases ICP but not great evidence

-**Children <10 years old**- Atropine- 0.02 mg/kg IV, minimum 0.1 mg

-Prevents reflex bradycardia from intubation

**RAPID SEQUENCE INTUBATION-** how we intubated in the ED

#1 point is that you DO NOT bag the patient once they go apneic

Overall- rapid administration of sedative followed by paralytic to produce unconsciousness and reduce aspiration risk

**PEARL-** Don’t need RSI in patients in cardiac arrest

**PEARL-** Dose medications off patients actual body weight- 20 of etomidate and 100 of suxs won’t be enough for everyone

**Sedative medications**

**Etomidate**- ultra short active sedative

Most favored for ED RSI

**Dose**- 0.3 mg/kg IV

**Onset**- 30-45 seconds

**Duration-** 10 minutes

**Considerations**- single dose with cause adrenal suppression but probably not clinically significant, biggest concern is in sepsis (can use ketamine)

**Ketamine**- PCP derivative- analgesia and sedation- dissociative agent

Patient maintains airway reflexes, good for asthmatics (bronchodilator)

**Dose**- 1-2 mg/kg IV or 3-4 mg/kg IM

**Onset**- 30-45 seconds

**Duration**- 30 minutes

**Considerations**- concern that it causes ICP rise but this is being debunked, some won’t use it in head injured patients

**Propofol-** ultra short acting hypnotic with NO analgesic properties

Very rapid onset and very short duration of action

Dose- 1mg/kg IV rapid push

Duration- 3-4 minutes

Considerations- causes hypotension so use caution in patients who are already hypotensive, excellent to use for post intubation sedation

**Paralytics**- rapidly after sedative meds

**Succhinylcholine (“suxs”)**- depolarizing paralytic (initially binds to motor endplate and causes depolarization then relaxation

Most favored paralytic for ED RSI

**Dose-** 1.5 – 2 mg/kg IV, 3-4 mg/kg IM

**Onset-** 60 seconds

**Duration-** 4-5 minutes

**Considerations­-** causes transient rise in potassium, use with caution in those on dialysis, crush injuries or burns more than 24 hours old, patients with a history of malignant hyperthermia or muscular dystrophy

**Rocuronium-** non-depolarizing paralytic (competitive inhibitor that competes for motor end plate sites with acetylcholine)

**Dose-** 1.2 – 1.5 mg/kg IV

**Onset-** 60 seconds

**Duration**- 30-45 minutes

**Considerations**- causes long paralysis, some prefer suxs so that the patient recovers from the paralysis if ET tube can’t be placed

**Vecuronium**- non-depolarizing paralytic- not used frequently for RSI but can be used for long term paralysis if needed

**Dose-** 0.1 mg/kg IV but 10 mg IV is a common dose across the board

**Onset-** 2-3 minutes

**Duration-** 45 – 60 minutes

**Considerations**- don’t use it routinely, titrate sedation aggressively to ensure patient is awake but paralyzed

**Intubation**- make sure your SOAP-ME is complete, quiet the room, check with your RT, medication nurse, and assistant to make sure they are ready, have an assistant to your right who does nothing but assist you

**Give medications-** 20 of etomidate, 100 of suxs is a common dose for the “average” 70 kilogram adult

**Keep NRBM on until you intubate**- although you don’t want to bag the patient a lot, your supervisor may ask for one or two breaths to ensure that bagging the patient is possible

**Hold the blade in your LEFT hand (even if you are left handed)**

**Open the patient’s mouth**

**-**Use 1st and 3rd fingers to scissor open the mouth

**\*\*\*\*\*\*NEVER ROCK BACKWARDS WITH THE BLADE\*\*\*\*\*\***

**Slowly advance the tip of the blade down the right side of the tongue**

**Use a sweeping motion to move tongue upwards**

**Look for your structures**

**Identify the epiglottis**

**For Mac blade- place blade tip anterior to epiglottis**

-For miller blade- directly lift up the epiglottis

**Best reference for this- airwaycam.com on YouTube**

**PEARL**- you are not “muscling” the tongue upwards, if you place the tip of the blade in the vallecula it will move the epiglottis upwards, if you have to lift a little bit, go upwards towards the ceiling and towards the back left hand corner of the room

**Once you see cords-** ask for the tube without looking away

**Use bimanual laryngoscopy**

**-**Have assistant place fingers on thyroid cartilage and you move

their fingers until you get the best view, whatever direction you need to get the best view

**Insert the tube**

-Pass through the right side of the mouth, place balloon just past

the cords and have your assistant inflate it

-Tube depth- 3 times the tube length- (7.0 ET tube = 21 cm)

**Confirm placement**

-Use end-tidal CO2 detector- yellow= YES, check the stomach for breath sounds then bilateral breath sounds on the chest and look for equal chest rise and fall

-Order a post-intubation chest x-ray

**Adjuncts**

**-Bougie**- if you can’t see cords but you can see aretynoid cartilages, insert the bougie and then insert the ET tube over the bougie

**Failure to intubate**

**-**Misplacement of the tube isn’t deadly but not recognizing it is

-If patient desats, bag the patient

-Prep the neck for a surgical cric

**\*\*\*\*IF YOU CAN’T BAG THE PATIENT, THEY NEED A SURGICAL CRIC\*\*\*\***

**-**If you can bag the patient, make a 2nd attempt, have the cric tray

and an LMA available

**How to do a cric-** search YouTube for “bougie assisted cric”

**Initial vent settings-**

**-**A/C mode (assist/control)

-Tidal volume- 6-8 cc/kg of IDEAL body weight (lung volumes in a 5 foot patient the same if they are 100 pounds or 500 pounds)

-“Average” 70 kg adult= 500 cc

-FiO2- 100 percent initially, work to titrate down as you can

-PEEP- 5 initially, 0 PEEP for asthmatic

-Initial settings- A/C tidal volume 500, 100 percent FiO2, 5 of PEEP

**Post-intubation sedation and analgesia**

Try to have this prepared BEFORE you intubate so your patient doesn’t wake up (etomidate only lasts 10 minutes)

**Propofol**- easy on/easy off- caution in hypotensive patients

Give bolus 0.5 – 1 mg/kg IV then 20 mcg/kg/min and titrate upwards

**Versed**- longer acting, harder to titrate

Give bolus 5mg IV then drip at 5 mg/hr

**Fentanyl**- provides analgesia- having a tube in your throat hurts!

Titrate 50-100 mcg IV (1 mcg/kg), less hypotension than morphine

**References:**

**The Manual of Emergency Airway Management- Dr Ron Walls, et. al.**

**Airway Cam Pocket Guide to Intubation- Dr. Richard Levitan**

Contact: steve@embasic.org