Airway Checklist

AIME For Airway Success

Before Intubation → Intubation → After Intubation

Preparation

Team Ready?
- ☐ EP aware/Experienced airway staff present
- ☐ Do we need additional help?
- ☐ Assign roles: Lead/MILS/BVM/Drugs/ETI

Patient Ready?
- ☐ Monitor (Pulse ox, Card, BP, EtCO2)
- ☐ Positioning
  - ☐ Ear to Sternal Notch
  - ☐ Reverse Trendelenberg 30^0
  - ☐ Ramp if obese
- ☐ Dual PreOxygenation (Both)
  - ☐ Nasal Cannula @ 15+LPM AND
  - ☐ NRB @ 15 -> flush LPM OR If Sats <96%
  - ☐ BVM/PEEP 5-10 cm (passive) OR
  - ☐ NIV
- ☐ Fluid Bolus
- ☐ Pressor support (consider if SI>.8)

Equipment Ready?
- ☐ BVM with PEEP/Pressure manometer
- ☐ DL/Mac VL ETT stylet 30-40^0 + Bougie
- ☐ Hyperacute (HA) VL ETT stylet 60-70^0
- ☐ Suction (1-2)
- ☐ SGA sized
- ☐ Bougie cric equip available

Performance

Airway Assessment & Plan
- ☐ Estimated Level of Difficulty Laryngoscopy/BMV/SGA/Surgical (Circle) Low, Moderate, High, Very High
- ☐ Considered Dangerous Physiology Low BP/low Sat/low pH/RV strain
- ☐ RSI vs. "Awake" approach
- ☐ Medications
  - ☐ RSI Induction/NMBA doses
  - ☐ Awake lido 4% Ez spray/5% oint
  - ☐ Ketamine facilitated coop .5-1.5 mg/kg
  - ☐ Post intubation sedation
- ☐ Plan A - Primary – DL, Mac VL+ Bougie or HA-VL
- ☐ Plan B - ReOx b/w ETI-> OPA/2-hand BVM
- ☐ Plan C – Alternative ETI approach
- ☐ Plan D - Rescue Ox-> SGA/bougie cric

Intubation
- ☐ Time Out – "All ready?" "Give drugs"
- ☐ Post RSI meds 45 sec count down
- ☐ Passive BVM+HFNO/vent prn
- ☐ Prob solve ETT advancement
  -ETT turn left over bougie
  -Stylet with VL ETT turn right
- ☐ EtCO2 (Waveform)

Protection

Post-Intubation
- ☐ Continuous Waveform Capnography
- ☐ Cycle pressures q3min
- ☐ Sedation/analgesia orders
- ☐ Consider ongoing NMBA
- ☐ OG Tube placement prn
- ☐ CXR
- ☐ Restraints prn
- ☐ Review ventilator settings

☐ **Debrief**

1) What went well? _____
_____ ☐ See Back

*2) What could be strengthened & how? _____
_____ ☐ See Back

☐ **Difficulty Rating** (Post Intubation)
(Circle) Low, Moderate, *High, *Very High

*For "High/Very High" Difficulty Ratings:
- ☐ Directly communicate to CC staff
- ☐ Document on chart
- What made the Airway Difficult?____
_____
_____ ☐ See Back

Adapted from www.SaferAirway.org template

AIME
For Airway Success
Airway Interventions & Management in Emergencies

Tubes Tools & Techniques

Airway Assessment
Assess for predicted difficulty with mask ventilation (BOOTS), Laryngoscopy and intubation (MMAP)

BOOTS	**MMAP**
Beard	**M**easure** &
Obese	**M**allampati class
Older	**A**tlanto-Occipital extension
Toothless	**P**athology: Upper airway
Sounds*	

* Sounds: snoring, stridor, wheezing
** Measure 3,3,1: Hyomental distance = 3 fingers under chin; Mouth opening = 3 fingers; Bite test = ability to bite upper lip with bottom teeth (1 = bottom teeth can move anterior to uppers)

Note: the neck should also be assessed for pathology, which may affect surgical access

Difficult Mask Ventilation
1. Insert Oral +/- Nasal airway. PEEP valve
2. 2-person/2-hand mask ventilation
3. Consider alternative mask size
4. Consider foreign body
5. Consider cricoid pressure release
6. Consider extraglottic rescue device (King Laryngeal Tube, newer gen LMA)

Note: extraglottic device will not work if pathology exists at or below glottis

Difficult Laryngoscopy
'Best Look Laryngoscopy'
1. Position yourself (raise bed) and patient (sniff)
2. 3/2/1 (3 things to do with 2-hands on 1st attempt)
   -Lift head with Rt hand if not contraindicated
   -Perform BURP/ELM (External Laryngeal Manipulation)
   -Consider 2-handed laryngoscopy
3. Manage the tongue and control the epiglottis … engage hyoepiglottic ligament
4. **Bougie on the bed with every DL attempt**
5. Based on experience may consider indirect technique - **Video Laryngoscopy**, unchanneled, ie GlideScope vs channeled device King Vision)

VL Tips (device specific):
- Best View: Not too close, blade tip in vallecula may be better;
- ETT Glottic Access: 'Too good' of a view means you are too close with no room for ETT, consider channeled device;
- Glottic Advancement: avoid excessive distal curve, retract stylet by 3-4 cm, once ETT beyond cords rotate tube clockwise, smaller or alternative ETT (Parker).

Preparation:

STOP IC BARS: **S**uction, **T**ubes (predicted size & ½ size smaller), **O**xygen delivery (High Flow Nasal Prong HFNP, Bag mask with PEEP valve or CPAP), **P**harmacology, **I**V fluids, **C**onfirm (CO2 capnography/esophageal detector), **BARS** (approach to unanticipated difficult airway).

B: Best look laryngoscopy, Blade change, Bougie*
A: Alternative intubation technique**
R: Rescue device***
S: Surgical airway

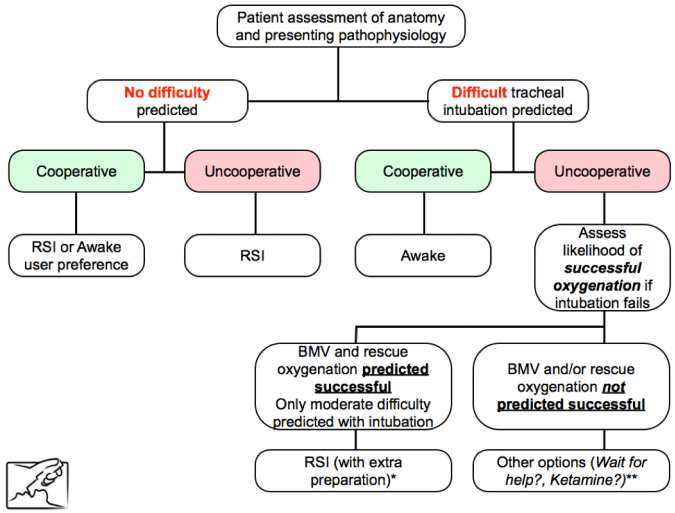
* Bougie Tips: feel clicks or gently place until end point met (30+/-5cm), leave laryngoscope in, if hold-up at glottis turn tube ¼ turn to left, use half to full size smaller tube
** Alternatives include, Video laryngoscope or other blade type
*** Rescue devices include i.e. LMA, LMAs (Supreme), i-gel or King LT

Equipment:

Age, Weight (kg)	**Laryngo-scope** S=straight C=curved	**ETT**	**ETT depth** (lips)	**LMA/ LMAs:** >30kg	**King LT**
0-6 m, 3-5 kg	0-1 S	3-3.5	9-10	1.0	NA
6-12 m, 6-9 kg	1 S	3.5-4	10.5	1.5	NA
1-3 yr, 10-14 kg	2 S	4-4.5	12-13.5	2.0	NA
4-7 yr, 15-23 kg	2 S or C	5-5.5	15-16.5	2-2.5	2.0 (35-45 in)
8-10 yr, 24-31 kg	3 S or C	6	18	2.5	2.5 (41-51 in)
30-50 kg	3 S or C	6.5-7.5	19-21	3	3 (4-5 ft)
50-70 kg	3-4 S or C	7.5-8	21-23	4	4 (5-6 ft)
>70 kg	3-4 S or C	8	21-23	4	5 (5-6 ft)

Decisions

1. Is this an anticipated difficult airway?
2. What do you anticipate difficulty with?
   - Ventilation (BOOTS)
   - Laryngoscopy & Intubation (MMAP)
   - Surgical access
   - Cooperation (patient)
   - Patient physiology
3. Do you have the necessary knowledge, skills and equipment to proceed with Rapid Sequence Intubation? Do you have a rescue ventilation plan? Is help available?



* RSI only if at least one of either intubation, rescue ventilation with bag mask or supraglottic device or surgical access is likely. The most experienced clinician should manage airway. Consider 'double set up' with the neck prepped for surgical access.

** If patients condition allows, consider waiting for more experienced clinician. Can you make this patient cooperative with pharmacologic agents (will not reliably facilitate laryngoscopy)? If no other options and acuity mandates immediate airway management RSI with 'double set up'

Awake intubation: Laryngoscopy with airway topicalization and light (anxiolysis :ie. low dose midazolam 0.1-0.2 mg/kg) sedation. If uncooperative AND predicted difficult airway: Ketamine, Ketafol (50;50 up to 80:20 combined total 1mg/kg +/-)

RSI: Intubation facilitated with induction agent and paralytic agents given in quick succession.

AIME for 1st ATTEMPT SUCCESS

1. Prepare High flow NP throughout, BVM with PEEP valve prn
2. Preoxygenate and Pre-treat with fluid bolus. consider pressor
3. **Plan A:** Best Look DL or VL if skilled;
   Plan B: Can't intubate CAN oxygenate: Bougie, VL or other indirect technique;
   Plan C: Can't intubate, CAN'T oxygenate (rescue): Extraraglottic device sized and available, Surgical equipment available
   (bougie-assited cric [10 blade /handle, #6 ETT])
4. Induction, paralysis
5. Wait for drugs to work but oxygenate & ventilate as necessary, Place tube
6. Confirm location with 2 of:
   - Seeing tube between cords
   - ETCO2 (waveform preferable)
   - Esophageal detector
7. Recheck vitals

Pharmacology

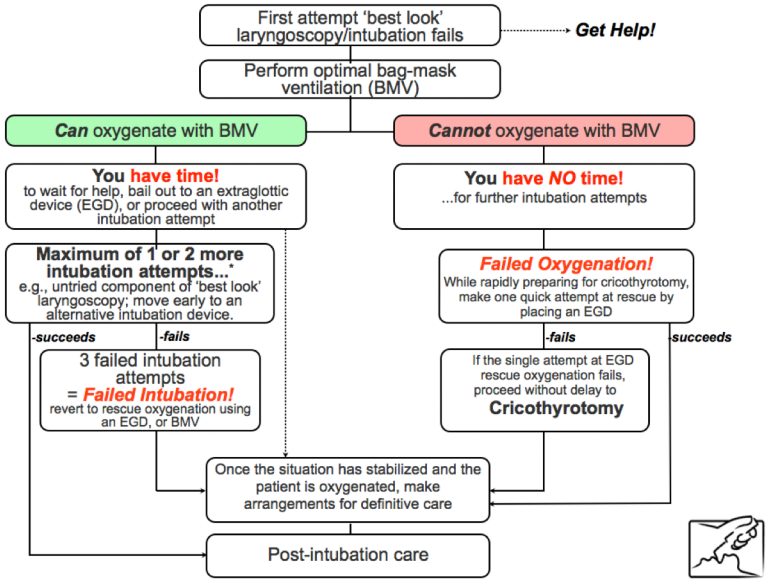
Rapid Sequence Intubation: All induction drugs require dosage adjustment based on age, weight, blood pressure and level of consciousness.

Pre-treatment: Preoxygenation: high flow nasal prongs (10-15 lpm (HFNP), BVM with PEEP prn (combined with HFNP= Poor man CPAP), fluid bolus considered in most patients. Other pre-treatment agents may be considered (ie pressor).

Agent	Dose (mix)	Onset Duration	Caution	Pearl
Induction				
Propofol	1-1.5 mg/kg (10 mg/ml)	< 30 sec 5-10 min	Hypotension	Reduce dose with low BP
Etomidate	.2-.3 mg/kg (2mg/ml)	<30 sec 5-10 min	Adrenal suppression	Minimal effect on BP
Ketamine	1-2 mg/kg (10 mg/ml)	30-60 sec 15-20 min	Increases HR/BP	+Asthmatic +If low BP & SNS not maxed
Paralysis				
Succinyl-choline	1-2 mg/kg (20 mg/ml)	< 1 min 5-10 min	Increase K Denervation Crush/burn; MH	Repeat dosing pre-treat with atropine
Rocuronium	1.2-1.6 mg/kg (10 mg/ml)	1-1.5 min 40-60 min	Use higher dose in low flow states	Alternative for succinycholine
Rescue				
Epinephrine	5-20 mcg	<1 min 5-10 min	increase HR	Add 1 ml (100mcg) with 9 ml = 10 mcg/ml
Phenylephrine	.5-1 mcg/kg 10 mg/ml eg. 75 kg= 50-100 mcg	<1 min 5-10 min	Bradycardia Dilute properly	10 mg in 100 ml of NS: 100 mcg/ml
Norepinephrine	.05-.1 mcg/kg/min start 2-4 mcg/min	1-5 min	Bradycardia, arrhythmia, extravesation	4 mg in 1000ml =4 mcg/ml 40 ml/hr~ 3mcg/min
Atropine	.02 mg/kg (max 1 mg)	< 1 min 10-20 min	Small dose can worsen bradycardia	Treat brady if occurs

Hypotensive patients or high risk for post intubation shock:
Volume load 10-20 ml/kg,
Ketamine of Ketafol with combined dose total 1mg/kg
(mix anywhere from 20:80 (K:P) ratio to 80:20 (K:P) ratio)
Consider pressor bolus or beginning norepinephrine infusion before induction in high risk patients (Shock index > 0.8)

Response to Encountered Difficult Airway



If clinician experience allows, a second attempt at intubation can be made. An untried component of "Best Look" direct laryngoscopy (DL) can be used, an adjunct such as a tracheal tube introducer (bougie), or an alternative intubation technique (indirect device ie VL). If a third attempt is made, generally, it may be best to maintain oxygenation until more experienced operator and or other equipment is available depending ion the situation.

Post Intubation options:

Fentanyl : 1-2 mcg/kg bolus start/titrate 1 mcg/kg/hour (use in combination with sedation)
Propofol: 0.5 mg/kg bolus; start/titrate 15-25 mcg/kg/min (ave: 70 kg ~10-40 ml/hr, hypotension may require pressor support after volume correction, with analgesia prn)
Midazolam: 0.02 mg/kg bolus; start/titrate 0.02 mg/kg/hour (in combination with analgesia)
Ketamine: 0.5-1 mg/kg bolus; start/titrate 0.5-1 mg/kg/hour (analgesia and sedation, may consider ketafol [ketamine 0.5 mg/kg with propofol 0.5 mg/kg total 1mg/kg=50:50 mix])
Rocuronium: 0.6 mg/kg bolus; 0.1-0.2 mg/kg q 20-30 min (ensure adequate sedation/analgesia)

Ventilator settings for adult patients: Weingart SD. Managing Initial Mechanical Ventilation in the Emergency Department. Ann Emerg Med. 2016 Nov;68(5):614-617.

Table 2. Summary table for the 2 ventilator strategies.

	Lung Protective Strategy	Obstructive Strategy
Mode	Volume assist control	Volume assist control
Tidal volume	Start at 8 mL/kg PBW; adjust for plateau pressure goal	8 mL/kg PBW
Inspiratory flow rate	Start at 60 L/min; adjust for comfort	60–80 L/min
Respiratory rate	Start at 16 breaths/min; adjust for $PaCO_2$ goal	Start at 10 breaths/min; adjust to allow full expiration
PEEP	Start at 5 cm H_2O; adjust according to table	0 cm H_2O (some may treat pt with PEEP $\leq$5 cm H_2O)
FIO_2	Start at 40%; adjust according to table	Start at 40%; adjust for SpO_2 $\geq$88%
Check for safety	Measure plateau pressure. If $\geq$30 cm H_2O, decrease tidal volume by 1 mL/kg	Measure plateau pressure or observe flow time graph. If plateau pressure $\geq$30 cm H_2O or flow/time graph shows incomplete expiration, decrease respiratory rate

PBW, Predicted body weight; *pt*, patient.