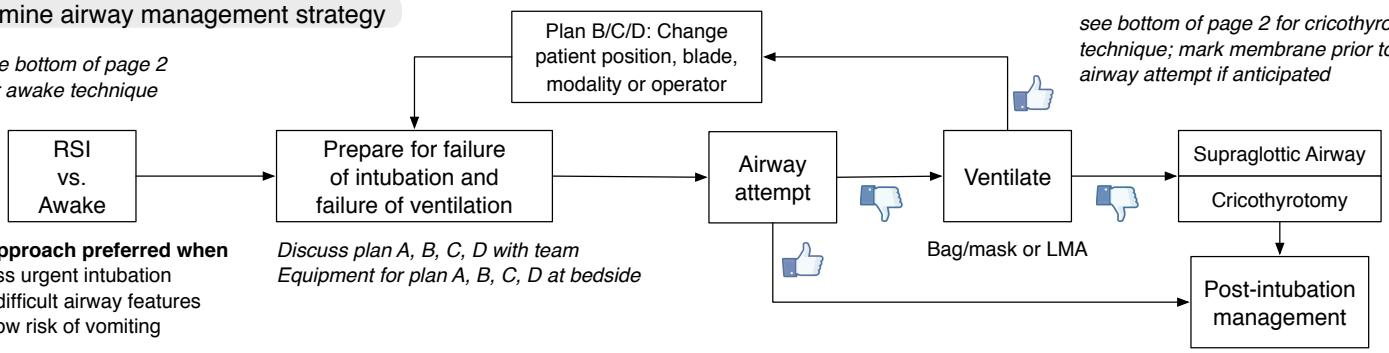
EDICT | Emergency Department Intubation ChecklisT

Preparation

- ❑ Consider the indication for intubation
  - Is non-invasive ventilation (CPAP/BiPAP) an option?
  - Is the patient DNI status?
  - Has patient/family consented, if applicable?
- ❑ Nasal cannula
  - 5 liters per minute to augment preoxygenation, then
  - ≥15 liters per minute post-induction to facilitate apneic oxygenation
- ❑ Preoxygenate with high-flow oxygen
  - ≥ 3 min or 8 deep breaths with face mask; O_2 regulator turned all the way up
  - If inadequate saturation with NC+facemask: use NIV or BVM with PEEP valve
  - If pt too agitated for preoxygenation: ketamine induction, preox, then paralyze
- ❑ Assess for:
  - Difficult laryngoscopy
  - Difficult BVM
  - Difficult extraglottic device
  - Difficult cricothyrotomy
  - **L**ook externally, **E**valuate 3-3-2 rule, **M**allampati score, **O**bstruction, **N**eck Mobility
  - **B**eard, **O**bese, **N**o teeth, **E**lderly, **S**leep Apnea / Snoring
  - **R**estricted mouth opening, **O**bstruction, **D**istorted airway, **S**tiff lungs or c-spine
  - **S**urgery, **H**ematoma, **O**besity, **R**adiation distortion or other deformity, **T**umor*
- ❑ Determine airway management strategy

see bottom of page 2 for awake technique



see bottom of page 2 for cricothyrotomy technique; mark membrane prior to airway attempt if anticipated

Awake approach preferred when
Less urgent intubation
More difficult airway features
Low risk of vomiting

Discuss plan A, B, C, D with team
Equipment for plan A, B, C, D at bedside

Bag/mask or LMA

- ❑ Check for dentures
  - Dentures in for bag mask ventilation, out for laryngoscopy
- ❑ Position patient
  - Auditory meatus to suprasternal notch (sheets under neck / occiput / shoulders)
  - Patient's head to operator's lower sternum (bed height)**
  - Torso angle of 30° recommended, especially in obesity and upper GI bleed
- ❑ Monitoring equipment
  - ECG
  - Pulse oximetry
  - Blood pressure
  - **Continuous end-tidal capnography** - verify function with test breath
- ❑ IV access
  - Two lines preferable

Equipment

- Use **Broselow tape** for sizes in pediatrics
- ❑ Ambu bag connected to **oxygen**
  - Size: approximate nasal bridge, malar eminences, alveolar ridge / Err larger
- ❑ Laryngoscopy handles - verify power
  - At least two
- ❑ Suction under patient's shoulder - verify function
  - If suspected soiled airway (blood, vomitus, secretions), suction under each shoulder
- ❑ Laryngoscopy blades - verify bulbs
  - Curved and straight / One size larger, one size smaller
- ❑ Oral airways
  - Size: Angle of mouth to tragus of ear (usually 80, 90, or 100 mm in adults)
- ❑ Nasal airways
  - Size: Tip of nose to tragus of ear (usually 26 Fr/6.5 mm, 28/7, or 30/7.5 in adults)
- ❑ Colorimetric capnometer
  - To be used if continuous not available or not functioning
- ❑ Endotracheal tubes - verify cuff function
  - Variety of sizes (≥ 8.0 mm preferred in adults to facilitate ICU care)
- ❑ ETT stylet
  - Straight to cuff, 35 degrees**
- ❑ ETT securing device
  - Tape if no device available
- ❑ Gum elastic bougie
- ❑ LMA with lubricant and syringe
- ❑ Difficult airway equipment
  - Cricothyrotomy tools / video laryngoscope / optical stylet
  - fiberoptic scope / Magill forceps if suspected foreign body

Drugs

- ❑ Pretreatment agents, if applicable
  - Pretreatment agents are always optional
  - Give as bolus 3 minutes prior to induction, except for fentanyl, which should be the final pretreatment agent, and should be given over 30-60 seconds.
- Fentanyl
  - 3 mcg/kg TBW if high BP a concern (aneurysms, dissections, high ICP, severe CAD)
- Lidocaine
  - 1.5 mg/kg TBW for reactive airways or increased ICP
- Atropine
  - .02 mg/kg IV or IM (min 0.1 mg, max 1 mg)
  - For infants, especially if receiving succinylcholine

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❑ Induction agent
- **Etomidate** 0.3 mg/kg TBW
- **Propofol** 1.5 - 3 mg/kg IBW+(.4)(TBW)
- **Ketamine** 2 mg/kg IV or 4 mg/kg IM IBW
- **Midazolam** 0.2 - 0.3 mg/kg TBW
- **Thiopental** 3- 6 mg/kg TBW

Reduce dose if hypotensive

❑ Paralytic agent
- **Succinylcholine** 2 mg/kg IV 4 mg/kg IM TBW
- **Rocuronium** 1.2 mg/kg IBW
- Vecuronium 0.3 mg/kg IBW if roc unavailable

Contraindications to succinylcholine
History of malignant hyperthermia
Burn or crush injury > 5 days old
Stroke or spinal cord injury > 5 days old
MS, ALS, or inherited myopathy
Known hyperkalemia (absolute)
Renal failure (relative)
Suspected hyperkalemia (relative)

❑ Normal saline flushes

❑ Phenylephrine
- For peri-intubation hypotension
- 100 mcg IV push as needed

❑ Post-intubation settings discussed
- **A/C**
- **FiO2** 100% – titrate down over time to SpO2 95%
- **RR** 18 [Asthma/COPD: 6-10]
- **TV** 8 mL/kg – use ideal body weight [6 mL/kg if sepsis / prone to lung injury]
- **I/E** 1:2 [Asthma/COPD 1:4 - 1:5]
- **Inspiratory Flow Rate** 60-80 L/min [Asthma/COPD 80-100 L/min]
- **PEEP** 5 cm H_20 [CHF 6-12→watch blood pressure] [PEEP 0 in Asthma/COPD]

❑ Personnel
- MD / RN / RT

RSI or Awake Technique

❑ Verify tube placement
- **End-tidal CO2** if using colorimetric – bright yellow with **six breaths**
- **Esophageal detection device** should aspirate without resistence if ETT in trachea
- **Bougie hold-up test** - see below
- **Repeat visualization** using direct laryngoscopy or alternate device
- **Auscultation**

Post-Intubation Care

❑ Secure ETT
- Record position at lips
- **Adults:** approx 21 cm (female) or 23 cm (male)
- **Pediatrics:** approximately ETT size x 3

❑ Orogastric or nasogastric tube

❑ Portable chest radiograph

❑ Opioid then sedative boluses/drips
- **Fentanyl** 2 mcg/kg bolus then 1 mcg/kg/hour
- **Morphine** 0.1 mg/kg bolus then .1 mg/kg/hour
- **Propofol** 0.5 mg/kg bolus then 15 mcg/kg/min
- **Midazolam** 0.05 mg/kg bolus then .025 mg/kg/hour
- **Lorazepam** 0.04 mg/kg bolus then .02 mg/kg/hour
- **Ketamine** 1 mg/kg bolus then 1 mg/kg/hour

These are starting doses - reassess frequently and rebolus/titrate upward as needed.

In the *just intubated* phase, especially if transport and procedures are imminent, aggressively analgese and sedate to a RASS† score of -4 to -5. In the *stable on the vent* stage, titrate down sedation and use opioids to target a RASS score of -1 to -2. Avoid re-paralysis.

Fentanyl and ketamine are least likely to cause or worsen hypotension.

❑ Head of bed to 30-45 degrees, higher if very obese

❑ In-line suction

❑ Adjust ETT cuff pressure
- Adjust to minimum pressure required to abolish air leak - usually 15-25 mm Hg by endotracheal tube cuff manometer

❑ In-line heat-moisture exchanger

❑ Blood gas within 30 minutes post-intubation
- Adjust RR (not TV) to appropriate pH and pCO2
- Keep pH > 7.1 for permissive hypercapnia
- Use incremental FiO2/PEEP chart for oxygenation
- Keep plateau pressure < 30 cm H_20
- pCO2 is **at least** ETCO2 but may be much higher

❑ Foley catheter

†Richmond Agitation Sedation Scale

❑ Watch for post-intubation complications
- **D**islodgement – check **EtCO2 waveform**, repeat laryngoscopy
- **O**bstruction – check for high PIP, **suction** secretions
- **P**neumothorax – **breath sounds** / lung sliding on **ultrasound**, repeat **CXR**
- **E**quipment failure – **disconnect** from vent and bag
- **S**tacking breaths / auto-PEEP - bag slowly, push on chest to assist prn

Bougie hold-up test: gently advance intubating stylet through ETT
- No resistance @ 40 cm: likely esophageal
- Resistance @ 26-40 cm (usually <30 cm): likely tracheal and patent
- Resistance @ less than 25 cm: likely clogged tube

❑ Verify that airway equipment is ready for the next patient

Awake Intubation Technique

❑ **Glycopyrolate** 0.2 mg or **Atropine** .01 mg/kg *glyco preferred, ideally given 15 min prior to next step*
❑ Suction then pad dry mouth with gauze
❑ **Nebulized Lidocaine** without epi @ 5 lpm *ideally 4 cc of 4% lidocaine but can also use 8 cc of 2% lidocaine*
❑ **Atomized Lidocaine** sprayed to oropharynx *especially if unable to give full dose of nebulized lidocaine*
❑ **Viscous Lidocaine** lollipop *2% viscous lido on tongue depressor*
❑ Preoxygenate ❑ Position ❑ Restrain prn ❑ Switch to nasal cannula
❑ Lightly sedate with **Versed** 2-4 mg or **Ketamine** 20 mg aliquots q 2 min
❑ Intubate awake **or** place bougie, then paralyze, then pass tube

Cricothyrotomy Technique

1. Vertical incision, palpate membrane
2. Blind horizontal incision through membrane
3. Blind finger through membrane into trachea
4. Bougie along finger into trachea
5. Lubricated 6.0 mm ETT or tracheostomy tube via bougie

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