

Emergency Department Intubation Checklist

- Consider the indication for intubation
 - Is non-invasive ventilation (CPAP/BiPAP) an option?
 - Is the patient DNI status?
 - Has patient/family consented, if applicable?
 - Preoxygenate with high-flow oxygen
 - At least 3 min or 8 deep breaths if possible, consider NIV if profound hypoxia
 - Assess for
 - Difficult laryngoscopy
 - Difficult BVM
 - Difficult extraglottic device
 - Difficult cricothyrotomy
 - Look externally, Evaluate 3-3-2 rule, Mallampati score, Obstruction, Neck Mobility
 - Beard, Obese, No teeth, Elderly, Sleep Apnea / Snoring
 - Restricted mouth opening, Obstruction, Distorted airway, Stiff lungs or c-spine
 - Surgery, Hematoma, Obesity, Radiation distortion or other deformity, Tumor*
- If suspected difficult airway and time allows, consider awake technique and/or call for help**
- Check for dentures
 - Dentures in for bag-valve-mask, 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 at 30° recommended, especially in obesity or upper GI bleed
 - Monitoring equipment
 - ECG
 - Pulse oximetry
 - Blood pressure
 - Continuous end-tidal capnography** - verify function with test breath
 - IV access
 - Two lines preferable
 - Nasal cannula
 - 5 liters per minute to augment preoxygenation, then 15 liters per minute post-induction to facilitate apneic oxygenation
 - 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 cuffs
 - 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
 - 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
 - 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 TBW
 - 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 post-intubation hypotension
 - 100 mcg IV push as needed

Emergency Department Intubation Checklist (page 2)

- Personnel MD / RN / RT
- 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 H₂O [CHF 6-12→watch blood pressure] [PEEP 0 in Asthma/COPD]

⚡ RSI or Awake Technique ⚡

- Verify tube placement
 - End-tidal CO₂** if using colorimetric – bright yellow with **six breaths**
 - Esophageal detection device** should aspirate without resistance if ETT in trachea
 - Bougie hold-up test** - see below
 - Repeat visualization** using direct laryngoscopy or alternate device
 - Auscultation**
 - Secure ETT
 - Record position at lips
 - Adults:** approx 21 cm (female) or 23 cm (male)
 - Pediatrics:** approximately ETT size x 3
 - Portable chest radiograph
 - Opioid then sedative boluses/drips
 - Fentanyl** 2 mcg/kg bolus then 1 mcg/kg/hour
 - Morphine** .1 mg/kg bolus then .1 mg/kg/hour
 - Propofol** 1 mg/kg bolus then 5 mcg/kg/min
 - Midazolam** .05 mg/kg bolus then .025 mg/kg/hour
 - Lorazepam** .04 mg/kg bolus then .02 mg/kg/hour
 - Ketamine** 1 mg/kg bolus then 1 mg/kg/hour
 - Head of bed to 30-45 degrees, higher if very obese
 - Orogastric or nasogastric tube
 - 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
 - In-line suction
 - 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 H₂O
 - pCO₂ is **at least** ETCO₂ but may be much higher
 - Foley catheter
- 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 analgesic 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.
- †Richmond Agitation Sedation Scale
- Watch for post-intubation complications
 - Dislodgement – check **EtCO₂ waveform**, repeat laryngoscopy
 - Obstruction – check for high PIP, **suction** secretions
 - Pneumothorax – check **breath sounds**, repeat **CXR**
 - Equipment failure or auto-PEEP – **disconnect** from vent and bag
 - Verify that airway equipment is ready for the next patient
 - 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

Awake Technique

Favored in patients who require intubation less urgently, have more difficult airway features, and are not high risk for vomiting

- 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

Incremental FiO₂ / PEEP Chart for Oxygenation

FiO ₂	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.0
PEEP (cmH ₂ O)	5	6	8	8	10	10	10	12	14	14	14	16	18	18	20

Consider effects of decreased preload as PEEP is augmented

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 *From Walls RM and Murphy MF: Manual of Emergency Airway Management. Philadelphia, Lippincott, Williams and Wilkins, 3rd edition, 2008; with permission.
 **From Levitan RM: Airway•Cam Pocket Guide to Intubation. Exton, PA, Apple Press, 2005; with permission.