

# VUMC Multidisciplinary Surgical Critical Care Service

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## SICU Standard Operating Procedure: Guidelines for Intubation

### I. Definition

Intubation is required for SICU patients who cannot maintain a patent airway, who are hemodynamically unstable, who have decreased LOC (GCS  $\leq$  8, non-purposeful),  $\text{paO}_2/\text{FiO}_2$  ratio  $<250$ , or a respiratory rate  $<10$  or  $>30$ . Rapid sequence intubation (RSI) is necessitated in patients with increased aspiration risk (e.g., bowel obstruction, recent oral intake, GERD).

### II. Equipment that must be present.

1. Cardiac monitor.
2. IV access.
3. ACLS drugs (obtain from Pharmacy).
4. Bag-valve-mask connected to Oxygen delivery system
5. Nasal cannula
6. Pulse oximetry.
7. CO<sub>2</sub> detector.
8. Laryngoscope/Intubation kit
9. Suction with Yankauer tip.
10. 10cc Syringe
11. ETT with stylette
12. Cricothyrotomy tray available (kept in Trach box)
13. Emergency Airway bag with bougie
14. Airway adjuncts (LMA, oral airway, etc.)
15. 11 blade scalpel available with 6.0 ETT

### III. Drugs used during intubation. These may vary depending on the fellow or attending performing the procedure.

1. Sedative:
  - ❖ Etomidate 0.2mg/kg; usually 20mg IVP (less if hypovolemic). Onset 60sec, Duration 3 -5min.
  - ❖ Propofol 2 mg/kg (less if hypovolemic). Onset 9-51 seconds (average 30 secs), Duration 3-10 mins.
  - ❖ Ketamine 2 mg/kg; usually 100mg IVP. Onset 30 secs, Duration 5-10 mins.
  - ❖ Midazolam: 0.01-0.03mg/kg or 1-3mg. Usually has minimal hemodynamic effects. Excellent for preventing recall.

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- ❖ Fentanyl 1-2 mcg/kg or 50-200 mcg. May cause hypotension and bradycardia.

2. Paralytic:

- ❖ Succinylcholine 1.5mg/kg IVP (usually 100mg)—unless contraindicated: Onset 20-50sec, Duration 4 -6 min. Succinylcholine contraindicated with prolonged bedrest, hyperkalemia, myopathy, burns, spinal cord injury, pseudocholinesterase deficiency, open globe, renal failure, and malignant hyperthermia. Can also cause significant bradycardia, especially with repeated doses.
- ❖ Rocuronium 1 mg/kg. Onset 1-2 mins. Duration 30 mins. No hemodynamic changes or significant contraindications.
- ❖ Vecuronium .1 mg/kg. Onset 2.5-3 mins. Duration 25-40 mins.
- ❖ Cisatracurium 0.2 mg/kg. Onset 2-3 minutes. Duration 25-35 minutes.

3. Pressors:

- ❖ Phenylephrine given in 100mcg doses (1 ml). May cause reflex bradycardia and should be avoided in patients with HR <60bpm.
- ❖ Ephedrine given in 5-10 mg doses. Has both beta and alpha properties and will cause increase in both HR and BP. Ideal for hypotension with bradycardia or low normal HR.

**Note: Sedative should always be given before paralytic**

**Reduce dose of induction agents in hemodynamically unstable patients and have vasopressors available for IV push or infusion.**

**Have 2x's the dose of meds needed at the bedside**

#### **IV. Preparation for Procedure**

1. Insure proper consent is obtained by the physician when possible, unless emergent.
2. Critical Care attending must be notified and present
  - a. If Critical Care attending is not available the anesthesia airway phone (cell: 615-887-7369, pager: 615-835-1509) should be called to have anesthesia attending and/or anesthesia team supervise as needed.
  - b. Critical Care attending may elect to have anesthesia present for high risk airways
  - c. For emergent airways, move forward to secure the airway with oropharyngeal airway and bag/mask ventilation if possible while

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another member of the team contacts anesthesia airway number for back up.

3. Identify medication nurse
4. Identify the individual performing the intubation, and back-up personnel
5. Verify a functioning IV (verified by the medication nurse)
6. Verify a functioning oxygen saturation probe, and have a back-up probe available. Blood pressure cuff should NOT be on the same extremity as the oxygen sat probe.
7. Verify medications between intubating personnel and medication nurse. Verify that an extra dose of all medications used are available in the room if needed.
8. Perform a "Timeout" once everyone that is to be involved with the procedure is at the bedside.

## **V. Procedure**

1. Wash hands, and don personal protective equipment.
2. Lay sterile towel(s) at head of bed to place equipment on in order to keep procedure as clean as possible.
3. Insert oropharyngeal airway.
4. Place nasal cannula attached to 6L oxygen.
5. Setup suction apparatus, and connect rigid suction tip catheter to tubing.
6. Check equipment.
  - a. Use syringe to inflate cuff on tube, assessing for leaks. Completely deflate cuff.
  - b. Insert the stylet into the endotracheal tube, ensuring that the tip of the stylet does not extend past the end of the endotracheal tube.
  - c. Check the laryngoscope batteries and insure the light is secure.
7. Position the patient's head by flexing the neck forward and extending the head (sniffing position) (only if neck trauma is not suspected). If cervical spine cord injury is suspected, in-line cervical spinal immobilization must be maintained during the entire process of intubation.
8. Check the mouth for dentures. Remove if present. Suction the mouth as needed.
9. Preoxygenate for 3-5 minutes using a self-inflating bag-valve-mask device attached to 100% oxygen, 100% NRB, BIPAP, or high-flow nasal cannula.
10. Administer medications as indicated.
11. Apply cricoid pressure as requested.
12. After the endotracheal tube is placed, insure the cuff is inflated with 5 to 10 ml of air.
13. Confirm endotracheal tube placement while manually bagging with 100% oxygen.
  - a. Attached disposable CO2 detector and watch for color change, indicating the presence of CO2.
  - b. Auscultate over epigastrium.
  - c. Auscultate lung bases and apices for bilateral breast sounds.

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- d. Observe for symmetric chest wall the movement.
  - e. Evaluate oxygen saturation (SpO2) by noninvasive pulse oximetry.
14. If CO2 detection, assessment findings, or SpO2 reveals that the tube has not been correctly positioned, deflate cuff and remove tube immediately. Hyperoxygenate with 100% oxygen for 3 to 5 minutes, and then reattempt intubation, beginning with the first step.
  15. If breath sounds are absent on the left, deflate the cuff and withdraw the tube 1 to 2 cm. Reevaluate for correct tube placement.
  16. Connect endotracheal tube to oxygen source or mechanical ventilator.
  17. Secure the endotracheal tube in place, reconfirming the placement afterward and note position of the tube at teeth.
  18. Ensure the physician has ordered a follow-up chest x-ray.

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## Checklist for Intubation “Time Out”

- \_ Verify Consent, Code Status (DNI), Urgent vs Emergent
- \_ Indication for endotracheal intubation (AMS, hypoventilation, hypoxia, etc)
- \_ Preoxygenate with a self-inflating bag valve mask attached to 100% oxygen, 100% NRB, BIPAP or high flow nasal cannula
- \_ Examine airway for
  - a) predictors of difficult intubation
  - b) dentures
  - c) loose dentition
- \_ Oral airway present and appropriately sized
- \_ Identify medication nurse
- \_ Identify the individual performing the intubation and back-up personnel
- \_ RT at bedside
- \_ Verify IV (By medication nurse)
  - a) Functioning properly
  - b) Not below BP Cuff
- \_ Oxygen saturation probe functioning (not below BP cuff and back-up probe available)
- \_ Induction drugs:
  - a) drawn up
  - b) sequence verified.
  - c) Verify an extra dose of all medications are in the room and post intubation sedation is available
- \_ Vasopressors available at bedside
- \_ Cardiac monitoring in place
- \_ Bag-valve-mask connected to Oxygen delivery system
- \_ All necessary equipment available:
  - a) CO2 detector
  - b) Stethoscope
  - b) Laryngoscope present X2 and verified
  - c) Suction with Yankauer tip
  - d) 10cc Syringe
  - e) ETT with stylette
  - f) Emergency Airway bag including bougie
  - g) 11 blade scalpel and 6.0 ETT at bedside
  - h) Percutaneous tracheostomy kit, trach instruments, and #8 Shiley trach available (#8 XLT or #9 if BMI>35 or with severe edema)
- \_ Attending (Critical Care or Anesthesia if CC unavailable) (In emergent setting, notify while intubation process moves forward)

\*\*\*\*ANESTHESIA AIRWAY\*\*\*\*

\*\*\*\*TRAUMA ATTENDING\*\*\*\*

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