

Temporary Protocol when Etomidate is unavailable due to national shortage
APPENDIX

PEDIATRIC PHARMACOLOGICAL ASSISTED INTUBATION

Indications:

In instances of absolute, life-threatening airway compromise due to any condition listed below where conventional oral or nasal intubation is not reasonable. (cannot be established without pharmacological assistance) Paralytics may be used if standard pharmacological assistance intubation fails to relax patient reflexes allowing for intubation. Long acting paralytics may be not administered until the airway is secured with documented respiratory stability.

The in-charge paramedic shall consider implementation of the Pharmacological Assisted Intubation (PAI) in instances of:

- Unable to establish or maintain ability to secure the airway by oral/nasal intubation
- Conditions requiring management and protection of the airway
 - Status Epilepticus or prolonged seizure activity associated with hypoxemia
 - Closed head injury associated with muscle rigidity and hypoxemia
 - Uncontrolled laryngospasms causing hypoxemia
 - Previous intubation efforts are unsuccessful and the patient fits the criteria of absolute, life threatening airway compromise
- Paralytics for age > 2 years old

Contraindications:

- ❖ Absolute contraindications to PAI:
 - Spontaneous breathing with adequate ventilation and a patent airway
 - Inadequate personnel or other resources to safely carry out the procedure
 - Obstructing oral laryngeal edema
 - Prior history or family history of malignant hyperthermia including the following symptoms (when paralytic agents have been used)
 - Intractable jaw spasms (Trismus)
 - Generalized rigidity
 - Body Temperature
 - Tachypnea/Tachycardia

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❖ **Relative Contraindications to PAI:**

- History of pseudocholinesterase deficiency (is an inherited [blood plasma enzyme](#) abnormality that is sensitive to paralytic agents)
- Significant body surface area burns (greater and 24 hours old)
- Spinal cord injury (greater than 24 hours old)
- Crush Injuries (greater than 24 hours old)
- Neuromuscular diseases such as myasthenia gravis, muscular dystrophy, Guillian-Bare syndrome (applies to use of paralytic agents)
- Patients with renal failure and those with elevated potassium levels (if known)
- Penetrating eye trauma
- Concern that intubation might be unsuccessful due to:
 - Major facial trauma or laryngeal trauma
 - Upper airway obstruction
 - Distorted facial or airway anatomy

Procedure:

1. Assemble appropriate equipment for intubation; including drugs and assistants.
 - Assure properly functioning laryngoscope with appropriate blades.
 - Select appropriate endotracheal tube with syringe attached to cuff and stylet in place. Have bougie ready to use.
 - Check cuffs for leaks
 - Prepare back up intubation tubes and laryngoscope
 - Prepare commercial tube securing devices/tape or cloth ties to secure tube
 - Assure properly functioning BVM
 - Assure suction is functional
 - Have all necessary drugs ready to administer
 - Patient should be connected to O2, ECG, SaO2 and NIBP
2. **Pre-oxygenate**
 - Administer 100% O2 for 2 minutes
 - Do not use BVM unless O2 Sats are below 90%
 - ◆ (BVM ventilation in this circumstance may cause gastric distention and subsequent aspiration of gastric contents. Gentle BVM ventilation with cricoid pressure can be utilized as drugs are administered.)
 - Monitor ABC's
3. Determine glucose level and IV access using Lactated Ringer's.
4. Monitor ECG and obtain vital signs every 5 minutes
5. Sellick's maneuver should be initiated prior to relaxation and continued until intubation is completed and position confirmed of intubation tube

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6. **Premedicate** patient:

- Administer Lidocaine 1 mg/kg IV; if patient > 8 years of age
- Administer Atropine 0.02 mg/kg IV/IO (min dose 0.1 mg, max dose 0.5 mg);
- Administer Versed 0.1 mg/kg IV/IO (max dose 4 mg).
 - Watch for hypotension (SBP > 70 mmHg plus 2 x age (years))
- If patient is hemodynamically unstable omit Versed:
 - **Administer Etomidate 0.1 mg/kg IV/IO –**
 - **If Etomidate is unavailable give Ketamine 1-2mg/kg over 30-60 seconds**

7. After 3 minutes post administration of Lidocaine, Atropine, Versed and/or Etomidate if adequate jaw relaxation is accomplished after muscle fasciculation's then perform intubation.

8. If need for neuromuscular blockage:

- Consider defasciculation dose of Rocuronium 0.1mg/kg; wait 10 seconds then administer full dose of Succinylcholine.
- Administer Succinylcholine 1 mg/kg IV/IO
- Do not repeat Succinylcholine

9. Visualize, confirm tube placement, inflate cuff then properly secure

10. Verify tube placement:

- Visualization of the intubation tube passing through the glottic opening
- Auscultation of chest for breath sounds in all lung fields
- Auscultation over epigastrium
- Improvement and/or maintenance of high O2 saturation on pulse oximeter
- EtCO2 required
- Clearing and fogging of endotracheal tube during ventilation and exhalation

11. Ventilate with 100% oxygen at a rate of 8-10 bpm with BVM to maintain 35-45 mmHg carbon dioxide return.

12. Rapid transport (should transport by ground be chosen, minimum of two medics should accompany the patient in the back during transport).

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13. Resedation:

- Administer Versed at 0.2 mg/kg SLOW IV every 10 minutes (max dose 6 mg)
- Total dose of Versed not to exceed 10 mg. Titrate administration of additional doses of Versed to SBP > 70 mmHg plus 2 x age (years)
- Should patient become combative after Succinylcholine has worn off or should patient movement impede further therapy or constitute a danger to the patient or crew, Administer Rocuronium 1mg/kg IV.

Failed intubation:

- A maximum of two (2) attempts at tracheal intubation maybe attempted within 1 minute.
- If unable to intubate with the initial two (2) attempts or if O2 sats >80%, initiate BVM ventilations while maintaining cricoid pressure until O2 sats are > 90%.
- In the event that intubation cannot be performed after paralysis then assist ventilations with a BVM.

Special concerns:

Use in caution with patients with pulmonary hypertension, valvular heart disease, or significant hepatic disease. Burn patients may develop resistance to nondepolarizing neuromuscular blocking agents.

Side Effects:

Arrhythmias, abnormal ECG, transient hypotension and hypertension, tachycardia, nausea and vomiting, asthma symptoms (including bronchospasm, wheezing, rhonchi, hiccups and rashes.)

Precautions for Paralytics:

Paralytics should be used with caution in patients, who are dependent on their own upper airway muscle tone or specific positioning to maintain the patency of their airway (e.g., cases of upper airway obstruction by abscess or abnormal anatomy). As paralysis occurs and these patients lose their ability to maintain an airway, BVM ventilation and intubation may not be possible because of obstructions or distorted anatomy.

In these patients, carefully titrated sedation and awake intubation may be more acceptable alternative in securing an airway.

Mallampati Classification



I



II



III



IV