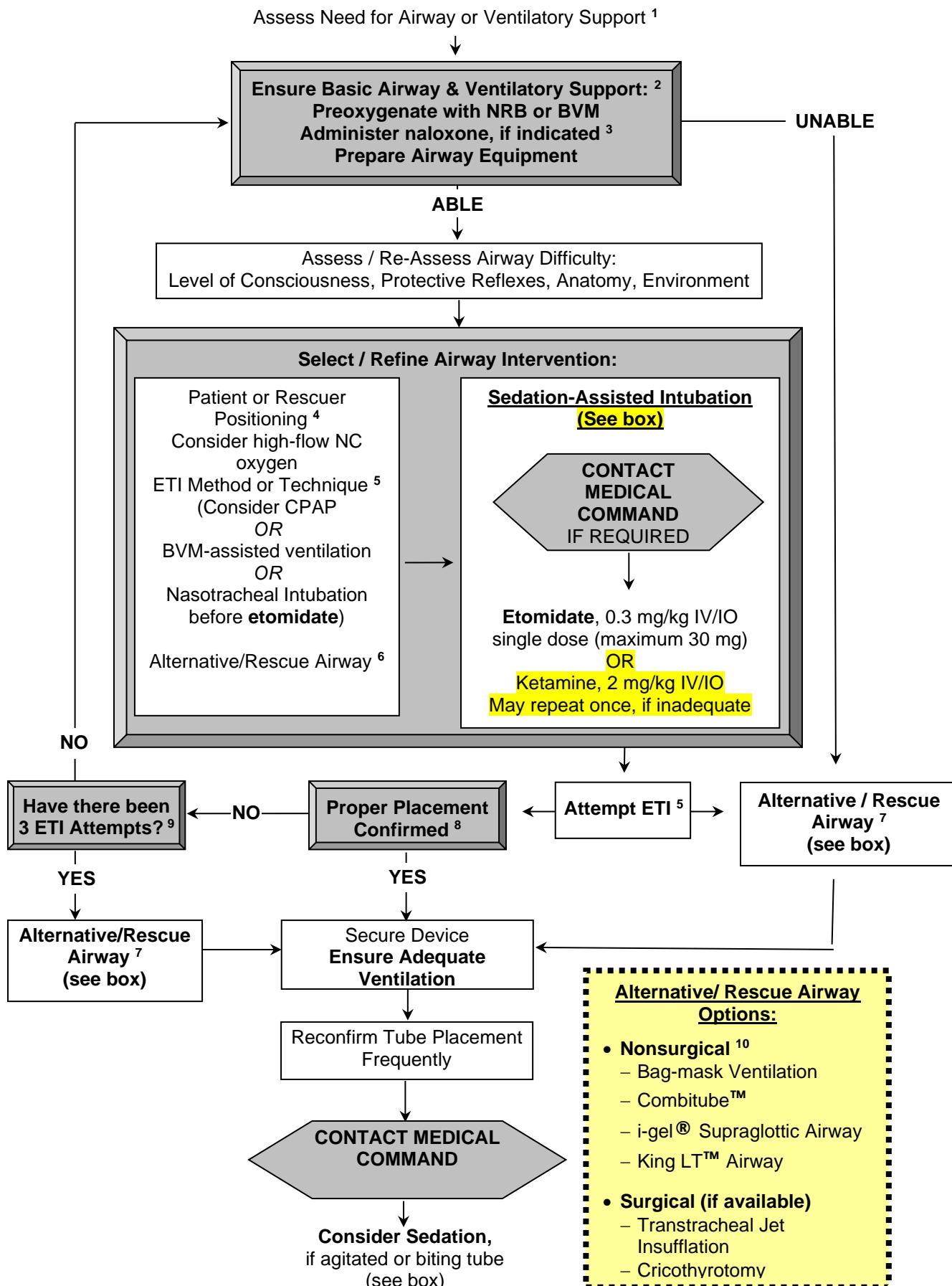


**SEDATION-ASSISTED INTUBATION
STATEWIDE ALS PROTOCOL [OPTIONAL]**



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Sedation Options:

Initial Sedation to Facilitate Intubation

NOTE: Choose ONE

**It is not appropriate to use two different medications for sedation prior to intubation.
Dosing is per patient encounter, not per intubation attempt.**

**Etomide, 0.3 mg/kg IV/IO
single dose (maximum 30 mg)
DO NOT repeat.**

OR

**Ketamine, 2 mg/kg IV/IO
May repeat once if inadequate sedation with first dose.**

Post-Intubation Sedation

NOTE: Consider using an objective assessment, like IMCRASS score, to follow patient agitation and guide need for post-intubation sedation. Ketamine lasts longer than etomidate and is less likely to require post-intubation sedation.

(Titrate to minimum amount necessary)

**Midazolam 1-5 mg IV/IO (0.05 mg/kg) titrated slowly
maximum 5 mg/ dose (pediatric max. 2 mg/dose)
may repeat every 5 minutes
until maximum of 0.1 mg/kg total**

OR

**Diazepam 5-10 mg IV/IO (0.1 mg/kg) titrated slowly
maximum 10 mg/dose (pediatric max. 5 mg/dose)
may repeat every 5 minutes
until maximum 0.3 mg/kg total**

OR

**Lorazepam 1-2 mg IV/IO (0.1 mg/kg) titrated slowly
maximum 2 mg/ dose
may repeat every 5 minutes
until maximum of 4 mg total**

ALSO MAY ADD

**Fentanyl 1 mcg/kg IV/IO
maximum 100 mcg/ dose
may repeat ½ dose every 5 minutes
until maximum of 300 mcg**

**SEDATION-ASSISTED INTUBATION
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Criteria:

- A. Sedation-assisted intubation may be appropriate for patients with compromised respiratory effort and partially intact protective airway reflexes. Examples of appropriate criteria for sedation-assisted intubation include:
1. Hypoxia (pulse oximetry < 90%) despite high flow oxygen by NRB mask or by CPAP.
 2. Inability to protect airway.
 3. Traumatic injury with GCS < 8 at the time of decision to intubate.

Exclusion Criteria:

- A. **CAUTION:** Sedation-assisted intubation may not be appropriate for patients with fully-intact protective airway reflexes. The advantages of an airway secured by an endotracheal tube must be weighed against the potential risk of worsened hypoxia, hypotension, bradycardia, or elevated intracranial pressure that may be side effects of the sedative or complications of the intubation attempt. There is also risk of worsening a patient's outcome or misplaced esophageal intubation with this procedure. ALS provider judgment is critical, and providers must be aware of the potential adverse effects of this procedure. Other options may be preferred in some situations:
1. CPAP and medications may be preferred if patient has acute pulmonary edema/ CHF.
 2. Nasotracheal intubation may be preferred in breathing patients.
 3. Assisting ventilation with BVM and high-flow oxygen may be preferred if ETA to receiving facility is short, if airway reflexes are fully-intact, or until naloxone can be administered in opioid overdose.
- B. This protocol may only be used by ALS providers who have been approved for this skill by their agency medical director and are functioning with an ALS service that meets all of the system requirements for sedation-assisted intubation. The Pennsylvania Department of Health does not condone sedation-assisted intubation by ALS providers or EMS agencies that do not meet all of the system requirements of this protocol, and does not condone the use of benzodiazepine and/or opioid medications for the purpose of intubation when given outside of a Department approved protocol. Medical command physicians should not order such medications in an attempt to facilitate intubation.

System Requirements:

- A. EMS region must approve the use of sedation-assisted intubation within the region, and the region must perform a QI audit of **every** case of sedation-assisted intubation for compliance with this protocol. All results must be forwarded to the Bureau of EMS for statewide QI.
- B. Agency medical director must approve of sedation-assisted intubation by the EMS service and must perform a QI audit of **every** case of sedation-assisted intubation for compliance with this protocol.
- C. Agency medical director must personally assure training and continuing education in patient selection, endotracheal intubation, use of alternative/ rescue airway device, use of wave-form ETCO₂ monitoring, and use of this protocol.
- D. Agency medical director must assure initial and ongoing competence (including supervised sedation-assisted intubation) for each individual EMS provider who will use sedation-assisted intubation. Only individuals credentialed for this procedure will perform the procedure. Medical directors should strongly consider requirements for regular supervised operating room intubations (if it is possible to arrange for such experience) and should consider the use of high-fidelity simulation as a component of assuring competence.
- E. **Two** ALS providers **above the level of AEMT** must be treating the patient before sedation-assisted intubation may be used.
- F. Service must carry an alternative/ rescue airway device in various sizes.
- G. Service must have the capability of monitoring and recording the following parameters continuously before, during and after all intubation attempts. Recordings of these parameters must be documented for every patient treated with this protocol:
 1. Wave-form ETCO₂ (documented to confirm intubation, and monitored continuously thereafter)
 2. Heart rate by continuous ECG monitoring (documented by recording strip demonstrating trending of heart rate before, during, and after each intubation attempt).
 3. Oxygen saturation by continuous pulse oximetry (documented by recording strip demonstrating trending of pulse oximetry before, during, and after each intubation attempt).
 4. Blood pressure (documented before and immediately after intubation or intubation attempts).

- H. Etomidate and/or ketamine for sedation-assisted intubation may only be carried by ALS services that follow all aspects of this protocol and will be removed from the service's ambulances if either the agency or regional QI determines that there are significant variances from this protocol.
- I. Regions or agency medical directors may add more stringent criteria for use within the agency. For example, regions or agencies may require that medical command be contacted before sedation-assisted intubation.

Notes:

1. The need for airway management is based upon the provider's judgment after a rapid global assessment of the patient. Indications for airway management include:
 - a. Apnea or agonal respirations
 - b. Airway reflexes compromised
 - c. Ventilatory effort compromised
 - d. Injury or medical condition compromising airway patency
 - e. Potential for future rapid compromise of airway (for example airway burns or expanding neck hematoma).
2. If patient ventilation is initially adequate, but airway management is anticipated, high-flow oxygen should be administered. If ventilation is inadequate, provide positive pressure ventilation with high-flow oxygen (ideally, BVM ventilation should be done with two-person technique, cricoid pressure, and an oropharyngeal/ nasopharyngeal airway if possible).
3. If opioid overdose is suspected, administer naloxone per Altered Mental Status Protocol #7002A or 7002P while ventilating with BVM if needed.
4. Techniques that may improve position for laryngoscopy are "sniffing position", head elevation, elevation of head of backboard if patient immobilized to backboard or raising stretcher height.
5. Consider using external laryngeal manipulation to improve laryngoscopy view. Video laryngoscopy may improve first pass success rate. Consider nasotracheal intubation in patient's that are awake or have clenching of teeth. May use directional -tipped ETT or BAAM whistle to assist with nasotracheal intubation. May use bougie, lighted stylet, or fiberoptic stylet as adjuncts to endotracheal intubation (ETI).
6. Secondary/ rescue airway options may be used as the primary airway/ ventilation technique in certain situations (for example: cardiac arrest to reduce interruption in compressions, opioid overdose until naloxone is administered, or confined/ entrapped patient in position that precludes laryngoscopy, or air medical patient inside a helicopter). Ventilation with BVM may be as effective as ETI in children when transport times are short.
7. There should be a low threshold for using a secondary/ rescue device when basic techniques do not provide adequate ventilation, when ETI may be futile or when there have been multiple attempts at ETI.
8. Confirm and document tube placement with absence of gastric sounds and presence of bilateral breath sounds AND continuous waveform ETCO₂ monitor. Follow Confirmation of Airway Placement Protocol #2032
9. Placing the laryngoscope blade into the patient's mouth is considered an intubation attempt. A maximum of 3 attempts (total for all providers) is suggested. The success rate dramatically decreases after 3 attempts. It may be appropriate to proceed to a rescue airway before 3 ETI attempts have been made. Regions or agency medical directors may determine the number of intubation attempts that are appropriate. Do not repeat sedation medication with each attempt.
10. ALS agencies must carry one type of nonsurgical Alternative/ Rescue airway available in various sizes.

Performance Parameters:

- A. Review PCRs for documentation of the following:
 1. Review for documentation of reason for intubation.
 2. Review for complications related to intubation attempts including hypoxia, bradycardia, hypotension, and esophageal intubation(s).
 3. Review for overall successful placement of an ETT or alternative airway and number of attempts at ETI and alternative/ rescue airway placement.
 4. Include recording strip of continuous trend of heart rate and pulse oximetry before, during, and after each intubation attempt.
 5. Document pulse oximetry, blood pressure, and heart rate readings before and after intubation attempts. Document waveform ETCO₂ readings after intubation attempts.
 6. Document number of attempts at ETI and/or alternative/ rescue airway placement.
 7. Document confirmation of tube placement by both auscultation and continuous waveform ETCO₂ consistent with protocol #2032