

## Kittitas County Prehospital EMS Protocols

**SUBJECT:      ADVANCED AIRWAY MANAGEMENT, to include RAPID SEQUENCE INTUBATION, SUPRAGLOTTIC AIRWAY (i-gel), & HIGH-RISK SITUATIONS**

- A. Rapid Sequence Intubation (RSI) should be initiated in a short period of time to ensure adequate oxygenation and ventilation in those patients with impending oxygenation or ventilation failure, those with decreased mentation that are unable to maintain airway patency and protect against aspiration, or those with a poor projected clinical course where respiratory failure is anticipated.
  
- B. Prior to beginning the procedure, ready all the following equipment and supplies:
  - 1. Bag-valve-mask (BVM) and nasal cannula (per high performance airway management guidelines) with functioning supplemental oxygen system.
    - i. Prior to intubation for Adult – use child size bag with appropriate adult size mask
    - ii. After intubation for Adult – may use adult size bag with appropriate adult size mask as needed.
  - 2. Suction unit with rigid pharyngeal tip and size 12 French Catheter.
  - 3. OPA and NPA airway adjuncts.
  - 4. Laryngoscope and endotracheal tubes.
  - 5. “Bougie” tube introducer for difficult airways.
  - 6. Atropine (for pre-medication per protocol).
  - 7. Succinylcholine
  - 8. Versed, Etomidate and Ketamine (for initial induction and continued sedation),
  - 9. Vecuronium
  - 10. Rocuronium
  - 11. Supraglottic Airway Device (i-gel or other MPD approved device)
  
- C. Ensure that a functioning, secure IV or IO line is in place.
  
- D. Establish cardiac monitor with 4-lead EKG, SPO2, and ETCO2.
  
- E. Position the patient as to allow for optimal pre-oxygenation, ventilation, and unobstructed view for direct laryngoscopy (“ramp as needed”).
  
- F. Pre-oxygenate the patient with 100% supplemental oxygen to allow for complete oxygen saturation and nitrogen “washout”.
  - 1. With NPA adjuncts in place (if tolerated by patient), apply a nasal cannula connected to supplemental oxygen at 15 LPM per High Performance Airway Management and Apneic Oxygenation Guidelines.

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2. With OPA adjunct in place (if tolerated by patient), hyperventilate the patient with a BVM device connected to high flow supplemental oxygen.
  3. Ideally, the patient should be oxygenated in this manner so that 100% SPO2 is maintained for at least 2 minutes, recognizing that this is not always possible due to the patient's clinical presentation.
- G. Pre-medicate as appropriate according to the patient's clinical presentation:
1. In cases requiring control of intracranial pressure, such as traumatic head injuries, hypertensive crisis intracranial bleed, or patients at risk for ventricular dysrhythmias.
  2. Proper induction is required for sedation and amnesia in the conscious patient who requires intubation or placement of Supraglottic Airway. The paramedic will choose **ONE** of the following medications to achieve adequate sedation and amnesia.
    - i. **Midazolam (Versed)** 0.1mg/kg in patients *younger* than 55 and 0.05mg/kg in patients *older* than 55, IV or IO bolus. **\*\*MAXIMUM TOTAL OF 0.5mg/kg and 0.25mg/kg RESPECTIVELY\*\***
      - **Pediatric dose:** 1.0-1.5 mg. IV or IO bolus
    - ii. **Etomidate** 0.3mg/kg, IV or IO bolus
    - iii. **Ketamine** 2mg/kg, IV or IO bolus
- H. To achieve complete relaxation of the patient, a neuromuscular blocking agent should be administered:
1. In cases of patients **NOT** suspected of traumatic brain injury, multisystem trauma, intracranial hemorrhage, or other causes of increased intracranial pressure – administer **Succinylcholine** 1.5mg/kg for *adults* OR 2.0mg/kg for *pediatrics*. Wait for fasciculation prior to intubation attempt or Supraglottic Airway placement.
  2. In cases of patients with suspected traumatic brain injury, multisystem trauma, intracranial hemorrhage, or other causes of increased intracranial pressure – administer **Vecuronium**, 1/10 the normal dose of 0.1mg/kg IV or IO bolus. Wait 30-60 seconds and then administer **Succinylcholine** 1.5mg/kg for *adults* OR 2.0mg/kg for *pediatrics*. You will **NOT** see fasciculation if Vecuronium was used prior to Succinylcholine.

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- I. Perform direct laryngoscopy and place ET tube per protocol. For difficult visualization, consider the use of a “Bougie” tube introducer or Glide Scope Video Laryngoscopy if available.
  1. If first attempt at intubation is unsuccessful, ventilate with BVM for 30-60 seconds.
  2. If relaxation is inadequate, administer a second dose of **Succinylcholine**, 1.0mg/kg, IV or IO.
  3. If bradycardia occurs during the intubation attempt, cease intubation attempts and ventilate with BVM and high flow supplemental oxygen.
- J. If repeated intubation attempts fail, ventilate with BVM until spontaneous respirations return or consider the placement of a Supraglottic Airway Device (see section P.).
- K. If the patient cannot be ventilated with a BVM and placement of a Supraglottic Airway Device is not possible, perform a cricothyroidotomy per protocol (see section Q.).
- L. Confirm the proper placement of ET tube or Supraglottic Airway Device:
  1. Note direct visualization of tube passing through vocal cords, if possible.
  2. Confirm bilateral lung sounds, and no noted epigastric sounds.
  3. Obtain wave form AND numeric ETCO<sub>2</sub> reading from the cardiac monitor.
- M. Consider the following for continued sedation/amnesia and patient comfort:
  1. **Versed** 2.5-5.0mg, up to 0.1mg/kg, IV or IO bolus. \***NOTE:** Patients must have a systolic BP > 100mmHg to administer. Recheck blood pressure 5 minutes after administration.\*
  2. **Ketamine** 2.0mg/kg, IV or IO.
- N. Consider the following pain management for patient comfort:
  1. **Morphine** 2.0mg, IV or IO. \***NOTE:** Patients must have a systolic BP > 100mmHg to administer. Recheck blood pressure 5 minutes after administration. May repeat dose every 5 minutes if systolic BP remains > 100mmHg to a maximum total dose of 0.1mg/kg.\*
  2. **Fentanyl** 25-50mcg, IV or IO. \*\*NOTE: Patients must have a systolic BP > 100mmHg to administer. Recheck blood pressure 5 minutes after administration. May repeat dose every 5 minutes if systolic BP remains > 100mmHg to a maximum total dose of 0.3mcg/kg.
- O. For patients that are combative and continue to struggle despite attempts at continued sedation and pain management, consider continued use of **ONE** of the following neuromuscular blocking agents to prevent the airway from becoming displaced:
  1. **Vecuronium** 0.1mg/kg IV or IO.
  2. **Rocuronium** 1.0mg/kg IV or IO.

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- P. Placement of the i-Gel Supraglottic Airway Device should be considered to ensure adequate oxygenation and ventilation when endotracheal intubation has failed.
1. Ensure the appropriately sized device has been selected according to the manufacturer's weight-based chart and general guidelines.
  2. Ensure the device is lubricated with a THIN layer of water-soluble lubricant.
  3. With the patient in a "sniffing" position and the airway opened using a "jaw thrust" maneuver, insert the device so that the outlet of the device will come to a rest against the anterior aspect of the airway.
  4. Glide the device downwards and backwards along the hard palate with a continuous, but gentle push until a definitive resistance is felt.
  5. **DO NOT** apply excessive force during insertion or if definitive resistance is felt. If resistance is felt prior to the device becoming seated in the appropriate location, attempt to rotate the device slightly as you gently push past the resistance.
  6. In the correct position, the tip of the device should be located in the upper esophageal opening, the outlet should be located against the laryngeal framework, and the incisors should be resting on the integral bite block, on or near the indication line below the recommended weight for the device.
  7. The device should be held in place until the location can be secured by adhesive tape or a commercial device.
  8. If repeated attempts at Supraglottic Airway placement have failed, ventilate with a BVM and airway adjuncts until spontaneous respirations return or consider cricothyroidotomy.
- Q. Cricothyroidotomy (refer to specific protocol) – The following situations may warrant the use of needle or surgical cricothyroidotomy:
1. Acute upper airway obstruction not relieved by advanced airway maneuvers such as right main stem intubation.
  2. Patient in respiratory arrest secondary to massive facial injuries, which prevents orotracheal intubation.
  3. Patient with neck/tracheal injury, where endotracheal intubation attempts have been unsuccessful.
- R. Continue to monitor the patient's EKG, blood pressure, SPO2 and ETCO2 for the duration of care.
- S. Advanced Airway Management Precautions (during flu season, pandemic, or other high-risk respiratory transmission concern) - Advanced airway management can produce aerosolized (airborne) patient secretions and increase the risk of transmission of disease. Consequently, EMS providers need to don PPE whenever undertaking advanced airway management. EMS providers need to exercise judgment.

The following treatments should be prioritized for management of shortness of breath and to limit aerosolized contamination of the workspace during high-risk situations. Treatment shall be based on clinical judgement and patient condition.

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1. Breathing Treatments:
  - Trial low or high flow O<sub>2</sub>, no greater than 6L/min with a mask placed over the patients face or over the top of the Nasal Cannula (NC) or non-rebreather mask (NRB) (do not routinely use NRB).
  - High flow O<sub>2</sub> with Albuterol treatments via Metered Dose Inhaler and Spacer unit.
  - When possible use a patient's prescribed rescue MDI to limit impact on EMS supply stock and bring that MDI to ED with the patient.
  - Nebulizer, except MDI as described, treatments shall be avoided to prevent aerosolization of OPIM.
  
2. Airway Interventions:
  - Endotracheal intubation via video laryngoscopy (avoid direct laryngoscopy)
  - Placement of I-Gel
  - Attempt simple ventilation management with BVM and OPA/NPA.
  - Avoid use of CPAP due to aerosolization concerns.
  
3. **Other precautions for high-risk patients/situations:**
  - Perform procedures away from contaminated environment and bystanders when possible outside in fresh air or in the back of unit with doors open, HVAC system on and driver's compartment blowers on high.
  - Use HEPA filters on all airway management procedures potentially producing aerosolized droplets when available.
  - Placing a mask and/or draping a towel over port of device or BVM while bagging a patient may also be used to reduce aerosolization.
  - Place golf tee in iGel port to prevent aerosolization unless needed for patient care.