



Jackson Hole Fire/EMS Operations Manual

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Title: **Procedure Guidelines:
Endotracheal Intubation**
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ENDOTRACHEAL INTUBATION - OROTRACHEAL (Procedure Guidelines)

SCOPE OF PRACTICE

Paramedics shall operate within their authorized Scope of Practice as limited to those skills and medication approved for use by the Physician Medical Director and Wyoming Office of EMS.

INDICATIONS:

Patients in cardiac, respiratory arrest, or in need of a definitive airway control that cannot be maintained by BLS maneuvers.

PURPOSE:

- Effective ventilating of patient
- Delivery of high concentration of oxygen
- Maintenance of airway patency
- Prevention of pulmonary aspiration
- Prevention of gastric insufflation
- Allowing more effective CPR

PRECAUTIONS:

- Do not use intubation as the initial method of managing the airway in any situation. Oxygenation and ventilation prior to intubation should be accomplished with appropriate BLS adjuncts and supplemental oxygen.
- During direct laryngoscopy, the jaw should be lifted with direct, upward traction by the laryngoscope. The teeth should not be used as a fulcrum for the laryngoscope
- Prepare suction beforehand. Intubation should take no more than 30 seconds to accomplish, preferably less than 15 seconds; do not lose track of time. If visualization of the cords is difficult, stop and re-ventilate before attempting intubation again. Consider using Endotracheal Tube Introducer (ETTI) or other adjunct.
- If more than 3 attempts are made, consider using Supraglottic airway device (i-gel, etc.).

TECHNIQUE:

USE APPROPRIATE BSI PRECAUTIONS

Prepare and organize equipment:

- Suction on and accessible
- Endotracheal tube cuff check
- ET Introducer and alternate airway (i-gel) available and accessible

- Stethoscope, ETCO₂ tubing connected to monitor and activated
- Check DL light or power for video laryngoscope.

DIRECT LARYNGOSCOPY (DL):

- Auscultate lung sound prior to intubation to establish a baseline
- Place OPA/NPA
- Pre-oxygenate patient with high flow oxygen via BVM and passive oxygenation 10 lpm via nasal cannula
- Place the head in a “sniffing position”. Flex the patient’s neck forward and extend the patient’s head backward. Placing a folded towel under the patient’s shoulder and head may be desirable
 - In case of possible spine injury, use a modified approach that emphasizes stabilizing the neck in a **neutral** position by the application of gentle in-line stabilization (utilizing another rescuer)
- Insert the blade into the right side of the patients mouth and use it to push the tongue gently to the left
- You may consider having an assistant apply gentle cricothyroid pressure to prevent pulmonary aspiration and to assist in visualization of the vocal cords
- Slowly advance the blade:
 - Straight blade going beneath the epiglottis
 - Curved blade going into the vallecula
- Advance the blade until the epiglottis and vocal cords come into view
- Suction any secretions as necessary
- The tube is inserted with the right hand into the right corner of the patient’s mouth, and through the vocal cords. **If the vocal cords cannot be visualized**, discontinue your intubation attempt and re-ventilate before attempting intubation again
- Once the cuff has passed through the vocal cords, remove the stylet (if used), ventilate to see if the chest rises, inflate the cuff, and check for proper tube placement using the following techniques:
 - Chest rise and fall with ventilation
 - Auscultation of bilateral lung sounds
 - Absence of gastric sounds
 - **End-tidal CO₂ monitoring and waveform capnography. Use values to prevent hyperventilation. Ventilate to maintain appropriate ETCO₂ levels according to patient condition and pathological demands.**
 - Condensation in the tube
 - Print and retain record of ETCO₂ readings on cardiac monitor.
- Once placement has been confirmed, secure endotracheal tube using commercial tube holder or other method.
- Consider placement of OPA and/or C-Collar for limiting head motion to dislodge tube.
- In the event that the ET diameter is too large, do not force it through the vocal cords. This may cause permanent cord damage. Cease the attempt, re-oxygenate, and attempt with smaller ET size

VIDEO LARYNGOSCOPY (McGrath):

- Preparation as above
- Turn device ON by pressing power button.
- Start by placing the tip of the blade into the right-hand corner of the mouth.
- As you advance the blade into the mouth, slowly sweep the tongue to the left, placing the blade in a midline position as the tip slides into the vallecula.
- Once the epiglottis is showing on the screen, lift as you would with a DL device until you have a good view of the vocal cords.
- Insert ET tube by placing the tip of the tube in at the right-hand corner of the mouth, advance slowly until you see the tube pass through the vocal cords.

- Remove McGrath device.
- Confirm placement of tube using standard confirmation procedures outlined above.
 - Print and retain record of ETCO₂ readings on cardiac monitor at time of tube placement and then upon transfer of patient care.
- Secure endotracheal tube using commercial tube holder or other method. Consider placement of OPA and/or C-Collar for limiting head motion to dislodge tube.

COMPLICATIONS AND HAZARDS:

- Esophageal intubation: common when you do not have direct visualization of the tube passing through the vocal cords. **Failing to recognize esophageal intubation is the most common and dangerous error.** If you cannot verify tube placement, remove the tube and oxygenate the patient until another intubation attempt can be made.
- Right bronchial intubation: if breath sounds are absent or diminished (usually on the left side) you have probably intubated the right main bronchus. Deflate the cuff on the ET tube and then pull the tube back very slowly until equal breath sounds are heard. Re-inflate the cuff and secure the tube
- Other complications that may arise include rupture of the trachea, pharyngeal-esophageal perforations, intubation of the pyriform sinus, and pneumothorax.
- Breaking the incisor teeth may be cause by too much pressure on them by the laryngoscope.
- Perforation with the stylet can be avoided by using stylets with a soft tip and not allowing the tip to protrude from the end of the ET tube.
- Tube size too large can lead to subluxation (incomplete or partial dislocation) of the arytenoid cartilage. If resistance is felt upon inserting the tube, then the tube is probably too large and should be removed.
- Vomiting and aspiration during traumatic intubation of patient with an intact gag reflex.
- Hypoxia and/or Hypercarbia due to prolonged intubation attempt(s).

NASOTRACHEAL INTUBATION

- See Procedure Guideline 17.2.15