Intubation Procedure Protocol

- **Indications** for Intubation/Advanced Airway Management
    - Inability of patient to protect their airway
    - Unable to oxygenate effectively
    - Unable to ventilate effectively
    - Impending Airway Compromise
    - Safety of EMS personnel during transport
- See Rapid Sequence Airway Management Medication Protocol for additional information on those medications

Scope: PARAMEDIC/CRITICAL CARE

- **Preparation for Intubation:**
    - Prepare the patient, equipment and medications prior to initiating the procedure.
        - Medications for post-intubation sedation and pain management should be prepared for administration along with any medications for the intubation procedure
    - Pre-oxygenated with oxygen 15 liter/minute or greater flow via non-rebreather mask and, if possible, nasal cannula at 10 liter/minute or greater to achieve oxygen saturation at 94% or greater for 3 minutes.
    - If possible, elevate head of bed 30-35 degrees.
    - Apneic patients should be ventilated per bag valve mask at 15 liters/minute or greater flow and, if possible, nasal cannula 10 liter/minute or greater to achieve oxygen saturation at 94% or greater for 3 minutes.
    - Patients on non-invasive positive pressure ventilation should be continued on such support until intubation
        - If bilevel NIPPV has a set back-up rate, it can be continued until the physical intubation attempt
        - Closely monitor patients with altered mental status on NIPPV
    - Continue, if possible, nasal cannula at 10 liter/minute or greater during intubation attempt to facilitate passive oxygenation during intubation attempt
    - If unable to obtain oxygen saturation at 94% or greater prior to intubation
        - Consider/determine what is expected maximal oxygen saturation given the clinical situation (end-stage COPD/CHF with baseline oxygen saturation of 88-92%; severe pulmonary impairment from COVID or pneumonia, suboptimal extremity perfusion skewing pulse oximetry reading)
        - Based on the expected maximal oxygen saturation, a target oxygen saturation and cutoff oxygen saturation are determined and agreed upon by EMS practitioners performing airway management prior to the intubation attempt
        - Target oxygen saturation is maintained for at least 3 minutes prior to the intubation attempt, and an attempt is terminated if cutoff oxygen saturation is reached
    - Administer medications.
- **Medication Algorithms:**
    - Consider pre-medication in stable patients and if able to be given at least 3-5 minutes prior to intubation. **Airway Management takes prioirity for deteriorating conditions or unstable patients**
        - **Atropine** (Bradycardia, Excessive Airway Secretions):
            - **Adult: 0.5mg IV/IO**
            - **Pediatric: 0.02mg/kg IV/IO**
        - **Lidocaine** (Reflex Mediated Bronchospasm and ICP Elevation)
            - **Adult/Pediatric: 1.5mg/kg IV/IO**
        - **FentaNYL** (Sympathetic Drive Mediated Tachycardia, Hypertension and Pain)
            - **Adult/Pediatric:1-3 mcg/kg IV/IO**

        - **Benzodiazepines:** Anxiolysis dosing
- **Intubation/Airway Placement:**
    - Use appropriately sized Laryngoscope Blade/Video Laryngoscope and Endotracheal tube (ETT) OR Supraglottic Airway
    - Hold laryngoscope in left hand while opening patient's mouth with right.
    - Insert laryngoscope blade into right side of mouth sweeping tongue to left. Using wrist and forearm lift the laryngoscope to visualize vocal cords without putting pressure on patient's teeth, lips or gums.
    - Maintain visualization of the vocal cords.
    - **Bougie device**:
        - Insert Gum-Bougie device into the oropharynx and into the glotic opening feeling for 'clicks' as coude tip of the device passes through the vocal cords and impacts the cartilaginous rings of the trachea.
        - Advance until resistance is felt. Depth should be 25-35 cm in adults.
            - If advancing past 40 cm or no resistance is felt, placement is most likely in the esophagus; remove Gum-Bougie introducer and have second crew member attempt if available.
        - Maintain visualization of the vocal cords. Have an assistant, if possible, load ET tube onto the Gum-Bougie device and advance tube into the right side of the patient's mouth along the bougie.
        - If resistance is felt, light left to right rotation with pressure can facilitate placement, or;
    - **Non-Bougie**
        - Insert the ET tube with rigid stylet into the oropharynx and into the glottic opening.
    - Advance endotracheal tube through vocal cords until balloon cuff is approximately 1 cm past cords.
    - Hold tube firmly in place while removing laryngoscope and rigid stylet or bougie
    - Inflate ET tube balloon with 6-10 cc of air.
    - Bag-tube ventilate. Observe chest rise, confirm presence of breath sounds bilaterally and absence over epigastrium.
    - If pulse-ox drops below 90% (or pre-determined threshold) or not successful after 30 seconds, abort attempt, hyper-oxygenate patient by bag-valve mask, and repeat attempt.
- **Multiple Attempts Flow Chart (Adapted from Airway911)**
    - Terminate attempt if patient is becoming hypoxic or unable to pass ETT
    - Ventilate via bag valve mask between all attempts and only proceed with next attempt after patient optimally oxygenated
    - Maximum Attempts by any **one** provider is TWO
    - Maximum Attempts by **all** providers is THREE
    - First Missed Attempt
        - Acknowledge Difficult Airway
        - **Must** utilize bougie on subsequent direct laryngoscopy attempts
        - Consider changing blade or laryngoscopy method (direct versus video)
        - Adjust Head Position
        - Consider changing provider
    - Second Missed Attempt
        - **Must** change provider
        - **Must** utilize bougie on subsequent direct laryngoscopy attempts
        - **Must** change blade or laryngoscopy method (direct versus video) **if not done previous**
        - Adjust Head Position
        - Consider reducing C-spine precautions
    - Third Missed Attempt OR **Unable to maintain appropriate oxygen saturations with BMV ventilations**
        - Proceed to Non-Visualized Supraglottic Airway

        - If unable to maintain a patent airway perform a cricothyroidotomy.
            - *Refer to* Cricothyrotomy-Surgical
- **Confirm endotracheal tube or supraglottic airway placement with:**
    - End tidal CO2 waveform monitoring
        - Make sure waveform is present while maintaining a 35-45 mmHg expired CO2 reading.
    - PLUS TWO of more other following
        - Auscultation of equal, bilateral breath sounds (equal chest rise and fall) with absent epigastrium sounds.
        - Direct visualization of tube passing through vocal cord opening.
        - Radiographic confirmation prior to transport (Inter-Facility Only)
- Consider nasogatric or orogastric tube placement for gastric decompression
- **Maintenance of Sedation:**
    - Ensure adequate analgesia and sedation *(Refer to* ***Analgesia/Sedation*** guideline)
    - Initial post-intubation sedation medication and pain medication should be administered upon confirmation and securement of the endotracheal tube or supraglottic airway, no later than 10 minutes from airway placement

Intubation Checklist

Preparation/Planning

- EMS monitoring equipment in place; baseline vital signs
- Consider fluid resuscitation/(push dose) vasopressors/tension pneumothorax
- Patient positioning optimized
    - HOB elevated 30-35 degrees (when possible)
- Evaluation of difficulty airway management: HEAVEN, LEMON, MOANS, SHORT
- Pre-Oxygenation: non-rebreather mask -or- BVM ventilation AND passive O2 via NC at greater than 10LPM
    - Consider OPA/NPA with BVM ventilation
    - BVM ventilation: use of PEEP and EtCO2
    - Maintain Pulse Ox greater than 94% for 3+ minutes -OR- modified target and cut-off pulse ox values determined
- Open C-collar if present

Equipment

- Suction on and ready
- Video and direct laryngoscopes checked and prepared
- Induction agent and paralytics prepared and doses confirmed
- ETT, Bougie, and alternative airways out and ready
- Initial post-intubation sedative and analgesics doses prepared

Induction/Intubation

- Induction agent administered
- Paralytic administered
- Suction prior to intubation attempt
- Intubate
- ETT placement confirmed with ETCO2 waveform (waveform present, maintaining 35-45 mmHg as applicable) plus two of the following:
    - Auscultation of equal breath sounds and negative epigastrium sounds
    - Direct visualization
    - X-ray confirmation (IFT only)
- Tube secured and OG tube placed
- Post-intubation sedation and analgesia

- Initial post-intubation sedation medication and pain medication selected and prepared for administration

HEAVEN	**LEMONS**	**MOANS**	**SHORT**
Hypoxemia	Look	Mask seal concerns	Surgery (neck)
Extremes of size	Evaluate 3-3-2	Obstruction/Obesity/Obstructive Sleep Apnea	Mass (neck)
Anatomic Disruption/Obstruction	Modified Mallampati	Age	Access/Anatomy
Vomit/Blood/Fluid	Obesity/Obstruction	No teeth	Radiaiton (neck)
Exsanguination	Neck Mobility	Stiff lungs	Tumor (neck)
Neck Mobility, Neurologic Injury	Saturation, Oxygen