

OPTIMAL SEQUENCE INTUBATION (OSI)

ASSESSMENT

- ✓ Airway status
- ✓ Ventilation
- ✓ Oxygenation
- ✓ Level of consciousness

INDICATIONS

- ✓ Airway protection for patient with decreased LOC (GCS \leq 8), facial trauma, airway burns, excessive secretions or other airway compromise
- ✓ Inability to oxygenate patient adequately by less invasive means
- ✓ Inability to ventilate patient adequately by less invasive means

PROCEDURE

1. Prepare all necessary equipment for endotracheal intubation as well as supraglottic rescue airway.*
2. Take spinal precautions if trauma is suspected.
3. Preoxygenate the patient:
 - ✓ Position patient with head elevated at 20 degrees or reverse Trendelenberg with ear-to-sternal notch airway alignment.
 - ✓ Place nasal cannula in the nares and if two oxygen sources are available give 4L/min. If only one O₂ source available, wait to attach oxygen when available.
 - ✓ Place patient on O₂ with a NRB at maximal flow (up to 25L/min.) or as possible for regulator.
 - ✓ If patient has adequate spontaneous ventilations, allow tidal volume respirations for 3 minutes or ask the patient to perform 8 vital capacity breaths.
 - ✓ If SpO₂ remains < 93% consider CPAP or BVM with PEEP valve at 5-15 mmHg to achieve SpO₂ > 98%.
 - ✓ If patient requires NIPPV (noninvasive positive pressure ventilation), prepare a BVM with face mask and PEEP for apneic period.

4. Initiate pharmacological treatment unless the patient is in cardiopulmonary arrest (sedation and paralysis not necessary in CPA) according to the following sequence:
 - ✓ Patients should be sedated with one of the following:
 - Etomidate at 0.3 mg/kg IV/IO over 30–60 seconds[†]
 - Midazolam at 1–2 mg q3 minutes IV/IM (6 mg max dose)
 - Ketamine at 2 mg/kg IV/IO slow push over 60 seconds
 - ✓ Administer lidocaine at 1 mg/kg IV/IO up to a maximum of 100 mg to patients with a head injury
 - ✓ Administer succinylcholine at 1.5 mg/kg IV/IO
 - ✓ If a second dose is required to achieve paralysis (if patient HR<60, administer atropine 0.5 mg prior to second dose), use either vecuronium or rocuronium
 - ✓ A second dose of succinylcholine at 1.5 mg/kg IV/IO may be given if required to achieve paralysis (if patient HR< 60, administer atropine 0.5 mg prior to second dose)
5. Apneic Oxygenate the patient:
 - ✓ Push Sedative and Paralytic
 - ✓ Detach face mask from regulator and attach nasal cannula reducing flow rate to 15L/min
 - ✓ Remove face mask from the patient
 - ✓ Perform Jaw Thrust and consider NP airways to maintain pharyngeal patency
 - ✓ If the patient required NIPPV (CPAP or BVM with PEEP) during the preoxygenation period, utilize the BVM with 2-handed seal to provide 4-6, slow, low volume, low pressure ventilations
6. The number of attempts at endotracheal intubation should be no more than a total of 2 for a single provider or 3 if two EMS providers attempt intubation. If unsuccessful, move rapidly to the placement of a rescue airway or quality BVM technique to provide adequate oxygenation and ventilation. Should these techniques be ineffective consider **Needle** or **Surgical** Cricothyrotomy.

POST INTUBATION

1. Determine proper airway placement and ventilation by using the following appropriate techniques:
 - ✓ Observation of the tube passing through the cords
 - ✓ Observation of symmetric expansion of the chest with ventilation
 - ✓ Observation of fogging of the tube during exhalation
 - ✓ Auscultation of bilaterally equal breath sounds and the absence of gurgling on auscultation over the epigastrium
 - ✓ Assessment of ETCO₂ with capnometry or capnography
 - ✓ Consider use of esophageal detector device in CPA patients
 - ✓ Assessment of SpO₂
 - ✓ Improvement in the patient's color and vital signs
2. Secure the endotracheal tube with a commercial tube holder device.
3. Apply PEEP valve to all intubated patients unless one of the following conditions is present:
 - ✓ Asthma
 - ✓ Hypotension from hypovolemia
 - ✓ Suspected pneumothorax
 - ✓ Cardiopulmonary Arrest
4. Immobilize the head and neck of all intubated patients. Apply a cervical collar in conjunction with other techniques as needed.
5. Administer fentanyl for analgesia at 0.5–1 mcg/kg q30 minutes. Administer midazolam at 0.02–0.05 mg/kg q 30 minutes. **Or if ketamine was used for induction**, administer ketamine at 0.5–1 mg/kg q30 minutes.
6. Consider administration of vecuronium to a patient in whom a return to their pre-OSI level of consciousness may threaten airway dislodgement, including those in whom a rescue airway was placed.

7. Document items substantiating proper airway placement as well as the method/device used to stabilize the endotracheal tube.
8. Reassess the endotracheal tube position subsequent to each significant movement of the patient and record waveform ETCO₂, including upon transfer of the patient to the hospital.

*Cuffed endotracheal tubes are recommended for all ages.

† Consider use of an alternative sedative if sepsis is suspected and the patient is not hypotensive.