# ENDOTRACHEAL INTUBATION (ADULT) POLICY #7100

**PREPARATION OF PATIENT:**

Remove or suction any foreign materials in patient's mouth.
Ventilate the patient with 100% oxygen for a minimum of 60 seconds.
Position the patient in the "sniffing" position with the neck flexed and the head extended.
Traumatic arrest.
- No apparent **C-spine** injuries: position the patient in the "sniffing" position with the neck flexed and the head extended.
- Suspected **C-spine injury:** an assistant will provide in-line stabilization in the neutral position.

Stop ventilations and compressions.

**PROCEDURE:**

Visualize the vocal cords, using appropriate technique for selected laryngoscope blade.
Repeat suction as necessary; remove foreign bodies with Magill forceps.
Maintain visualization of the vocal cords and insert the tube into the trachea until the cuff is situated just below the vocal cords.
- Cricoid pressure may assist with visualization of the cords. It may also assist with the control of regurgitation by occluding the esophagus.
- Intubation may be attempted a maximum of three times.
- The patient should be ventilated between each attempt.
- Each attempt may take no longer than 30 seconds.

Remove the laryngoscope and stylet.
Hold the tube in the correct position (approximately 22 cm mark at the teeth) by grasping it firmly in one hand. The tube is to be secured in this position.
Inflate the cuff with 10 ml air.
Ventilate the patient with 100% 02 by means of a bag valve breathing device or 40 L/min resuscitator.
To evaluate tube placement:
- Observe for bilateral rise and fall of the chest.
- Auscultate breath sounds bilaterally and over the stomach.

Connect the Toomey syringe (esophageal detector device) to the endotracheal tube and exert steady pressure. Withdraw 30 cc of air.
- If no resistance, tube is in the trachea.
- Resistance to suction or rebound down toward or to zero mark after release of syringe plunger indicates esophageal intubation.

If tube is in trachea, proceed with ventilation.
If the tube is in the esophagus, remove and begin procedure again.
Insert an oropharyngeal airway or bite block if required.
Secure the tube in place at about the 22 cm mark at the teeth by use of an ET tube holder and/or tape.
Reassess the tube position frequently during the call, each time the patient is moved or the tube is manipulated.
- Observe continuously for bilateral rise and fall of the chest.
- Auscultate breath sounds bilaterally and over the stomach.
- Check the centimeter marking at the level of the incisors and compare with initial marking.
- Test placement of tube with esophageal detector device.

**DOCUMENTATION:**

Documentation shall include:
Bilateral breath sounds after insertion.
Verification that esophageal detector device indicated tracheal position.
Size of ET tube.

Certification # of medic inserting tube.
Time of insertion.
Number of attempts required.
Any procedural problems or complications.

**PROBLEM SOLVING:**

**Mainstem Bronchus Intubation:**

– Breath sounds decreased or absent on the one side (usually left).

Withdraw the tube 1 cm.
Auscultate bilateral breath sounds.
Repeat until breath sounds are equal bilaterally or until the 22 cm marking on the tube is at the level of the incisors.
Secure the tube.

**Esophageal Intubation:**

– Bilaterally diminished or absent breath sounds, failure of the chest to rise and fall, abdominal rise and fall with ventilation, abdominal distention, or epigastric sounds with each ventilation, strongly suggest esophageal intubation.

**NOTE: Any or all of these signs may be absent, especially in the frail and elderly patient.**

Extubate immediately and ventilate with 100% oxygen.
Consider re-intubation with either ET tube or Combitube.

**Dislodgement:**

– Diminished or absent breath sounds, absence of chest excursion.

Extubate immediately and ventilate with 100% oxygen.
Properly secure the tube with an ET tube holder and/or tape to prevent dislodgement.
Disconnect the ventilation device whenever it is necessary to interrupt ventilations - i.e.: defibrillation, cardioversion, transfer of patient to gurney, ambulance, etc. to prevent dislodgement.
When moving the patient, manually secure ET tube.

**Emesis:**

Suction.
Consider placement of a Combitube for large amounts of passive regurgitation.

**EXTUBATION:**

**Indications:**

– Failure to ventilate, including:

Failure of the chest to rise.
Absent breath sounds bilaterally or abdominal distention without breath sounds.
Esophageal intubation.
Malfunctioning equipment (i.e.: cuff leak).

– Patient actively resisting and/or gagging on tube (SO)

**Procedure:**

– Suction oropharynx.
– Oxygenate the patient.
– Turn the patient's head or log roll entire body to the side.
– Be prepared to suction; anticipate emesis.
– Deflate the cuff.
– Withdraw the tube on exhalation.
– Monitor patient's respiratory status and intervene as necessary.
– Provide supplemental oxygen.

# ENDOTRACHEAL INTUBATION (ADULT)

**POLICY #7100**

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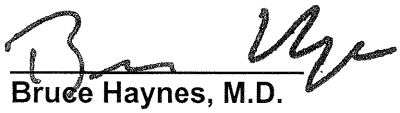
**APPROVAL:**



**Bruce Haynes, M.D.**
**EMS Medical Director**

DATE: 01/01/03

MEDICAL PROCEDURES

# ADMINISTRATION OF ENDOTRACHEAL MEDICATIONS

**POLICY #7110**

**INDICATIONS:**

The following medications may be instilled directly into an endotracheal tube prior to or when unable to establish IV access:

Atropine
Epinephrine
Lidocaine

**PROCEDURE:**

Ventilate several times.

Stop CPR.

Administer drug by inserting needle of prefilled syringe into ET opening and injecting appropriate amount into tube. **NOTE: If not permanently attached to syringe, needle must be removed from the syringe prior to instilling any medication into the ET tube.**

Utilize doses in accordance with Treatment Protocols.

Adult: dose: use a volume of approximately 10 ml for each drug administration.

Total volume of all endotracheal medications for adults should not exceed 30 ml.

Mix volume of medication with adult normal saline to reach suggested volumes.

Pediatrics: Refer to Pediatric Drug Guide for correct amount to administer via ETT.

Momentarily occlude ET tube with finger while reattaching O2 source to prevent medication from being expelled by residual air in lungs.

Reattach bag and ventilate forcefully 5 times to disperse drug.

Resume CPR (entire process should take less than 10 seconds).

**APPROVAL:**

**Bruce Haynes, M.D.**
**EMS Medical Director**

# INTRANASAL MEDICATION ADMINISTRATION POLICY# 7120

## I) PURPOSE:

To define the indications and use of intranasal medication administration in the prehospital setting by Paramedics and AEMT personnel.

## II) INDICATIONS:

A) Poisoning – Narcotic Overdose
   1) Indicated for patients who are unconscious/unresponsive in whom an opiate overdose is suspected without IV access who require urgent medication administration

B) Altered neurologic function - Seizures
   1) Indicated for patients who are actively seizing without IV access who require urgent medication administration

C) Behavioral emergencies – For patients exhibiting severe agitation
   1) Indicated for severely agitated patients who require urgent medication administration to reduce the risk of injury to patient or others

## III) CONTRAINDICATIONS:

A) Epistaxis
B) Nasal trauma
C) Nasal septal abnormalities
D) Nasal congestion or discharge

## III) APPROVED MEDICATIONS FOR INTRANASAL ROUTE:

A) Glucagon
B) Naloxone (Narcan)
C) Midazolam (Versed) – <u>5 mg/ml concentration required</u>

## IV) PROCEDURE:

A) Determine appropriate medication dose per protocol
B) Draw up medication into a syringe using appropriate transfer needle
C) Purge air from syringe
D) Place mucosal atomization device on the end of the syringe and screw into place
E) Gently insert the atomizer into the nare. Stop once resistance is met
F) Rapidly as administer the medication when patient fully exhales and before inhalation.
   **<u>ADMINISTER ½ DOSE IN EACH NOSTRIL</u>**
G) Do not exceed 1.0 ml per nostril

H) Monitor ECG, Vital Signs (BP, HR, RR, $SPO_2$)
I) Evaluate the effectiveness of the medication, if the desired effect has not been achieved, consider repeating and/or changing route of administration

V) PRECAUTIONS:
A) Nasal administration does not always work for every patient
B) Nasal administration is less likely to be effective if the patient has been abusing inhaled vasoconstrictors such as cocaine

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**APPROVAL**

Bruce E. Haynes, M.D.
EMS Medical Director

PROCEDURES

# DEFIBRILLATION

**POLICY #7200**

DEFIBRILLATION

**INDICATIONS:**
- Ventricular fibrillation.
- Pulseless ventricular tachycardia

**PROCEDURE:**
- Apply conductive gel or defibrillator pads
- Select energy level.

| **Monophasic** | 1st | 2nd | 3rd/subsequent |
|---|---|---|---|
| Adult: | Max (360) J | Max (360) J | Max (360) J |
| Pediatric: | 2 J/Kg | 4 J/Kg | 4 J/Kg |
| | | | |
| ***Biphasic** | 1st | 2nd | 3rd/subsequent |
| Adult: | *200 J | *200 J | *200 J |
| Pediatric: | 2 J/Kg | 4 J/Kg | 4 J/Kg |

- Press the charge button to energize the paddles.
- Clear all personnel from patient contact. Call out, "All Clear" and confirm that no one is in contact with the patient (discontinue ventilations and remove oxygen during defibrillation)
- Place the paddles on the chest (right sternal border and left lower chest @ anterior axillary line). The anterior / posterior placement should be used for obese patients
- Exert firm pressure on the paddles while simultaneously depressing the paddle buttons.
- Immediately resume CPR for 2 minutes
- Assess patient for any change in rhythm, check pulse for potentially perfusing rhythm

NOTES:
- ***Follow manufacturer's recommendations**. If none listed, utilize energy levels as noted above.
- Documentation should indicate if monophasic or biphasic energy was used and the amount of Joules administered.
- Count first responder countershock/AED use/ Public access defibrillation as part of the ALS algorithm.
- During transfer of care between two different types of defibrillators (monophasic or biphasic), providers should restart with the energy level prescribed in the defibrillation protocol for their type of equipment.
- When defibrillating pediatric patients:
  - Pediatrics less than 1 year/10 Kg weight: use "infant" paddles on patient.
  - Pediatrics ≥ 1 year/10 Kg: use anterior/posterior paddle or pads placement.
- Safety Concerns – do not defibrillate patient in water; remove NTG patch prior to defibrillation; paddles should be placed 5 inches from any pacemaker or implanted defibrillator.

Approved:

Bruce Haynes, M.D.
EMS Medical Director

Medical Procedures

# Automated External Defibrillation (AED)

**POLICY # 7210**

These standing orders are for cardiac arrest patients age one year or greater. Large pads can be applied front and back as necessary. (excluding penetrating trauma to the head, neck, or trunk).

I. One Shock Programmed Device:

a. Determine patient to be unconscious, pulseless, and with absent or agonal respirations.
b. Initiate CPR x 2 minutes (unwitnessed arrest); ventilate with 100% oxygen if possible. Witnessed arrest (by AED Provider): CPR until AED ready.
c. Turn on Automatic External Defibrillator (AED), attach appropriate defibrillator pads; press analyze. (If the AED is equipped with a recording device, record patient incident scenario as soon as possible.)
d. When ready (witnessed) or after 2 minutes CPR completed (unwitnessed), announce "analyzing rhythm-stand clear!" and allow AED to determine rhythm.
e. If the AED determines that a shock is to be delivered, allow AED to charge while continuing CPR. Once the machine signals it is ready to defibrillate, announce "stand clear!" Verify that no one is in contact with the patient and press the shock button.
f. Immediately resume CPR for 2 minutes. Re-analyze. Defibrillate if indicated.
g. If "no shock advised", check carotid pulse for 5-10 seconds. If pulse present and no breathing, ventilate at 8-10 breaths per minute.
h. ALS / LALS providers: if patient remains pulseless after the first two shocks, while CPR continues insert appropriate airway adjunct and ventilate 8-10 breaths per minute (if patient appears to be 4 feet or taller).
i. If the machine prompts "check patient", analyze patient and continue with defibrillation and CPR in accordance with Policy #7200.

II. Three Shock Programmed Device:

a. After first shock may ignore prompts and deliver 2 min. of CPR, then analyze

**Or**

b. May follow manufacturer guideline of 3 stacked shock protocol. This may be necessary with automatic AEDs that analyze and delivers shock without user pushing button, or non-programmable AEDs.

III. Transporting Responders and/ or ALS Rendezvous:

a. After sixth shock is delivered, prepare patient for transport to basic emergency facility or rendezvous site.
b. Once patient is in the rig, prior to leaving scene, you may reanalyze, if indicated by "check patient" prompt. Proceed as indicated by AED. If no shock advised, proceed with CPR and transport.
c. While en route, if a "check patient" prompt is received, pull to the side of the road and analyze the rhythm. Proceed as indicated by AED. **This should be done only once during transport.**

IV. Non-Transporting Responders:

a. If patient persists in a shockable rhythm, continue administration of shocks, as per protocol until arrival of transport unit.

b. If patient presents with three (3) consecutive non-shockable rhythms, continue CPR and do not analyze unless AED prompts, "check patient". Minimize interruptions in CPR (e.g. to analyze rhythm, deliver shock). Keep interruptions as short as possible, 5-10 seconds if possible.

After six shocks, prepare for immediate transport, en-route rendezvous, or ALS/LALS

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## APPROVAL

Bruce E. Haynes, M.D.
EMS Medical Director

MEDICAL PROCEDURES

# COMBITUBE

**POLICY #7300**

**INDICATIONS:**

- Cardiac arrest.
- Respiratory arrest:
  - Unconscious.
  - No gag reflex.
  - Apnea or respiratory rate < 6/minute.

[ Appears at least 4 feet tall (for SA size) 5 feet tall (for regular size)]

**EQUIPMENT:**

- Combitube, regular size (required), SA (small adult) size recommended.
- Right angle emesis deflector.
- 140 mL syringe.
- 20 mL syringe.
- Suction catheter.
- Toomey syringe.

**PREPARATION OF EQUIPMENT:**

- Assemble all equipment.
- Inflate cuffs on the Combitube to test for leaks.
- Attach emesis deflector.
- Lubricate distal tip of Combitube.

**PROCEDURE:**

- Ventilate the patient with 100% oxygen prior to Combitube insertion.
- Place the head in a neutral position.
- Grasp the lower jaw with the thumb and index finger and lift. Hold the Combitube in the other hand (with its curvature in the same direction as the natural curvature of the pharynx).
- Blindly insert the tube gently into the mouth and advance into the throat until the front teeth are between the two black rings on the tube.
- Do not force the tube. If the tube does not advance easily, redirect it or withdraw and reinsert.
- Inflate cuff #1 with 100 mL of air (85 mL for SA size).
- Inflate cuff #2 with 15 mL of air (12 mL for SA size).
- Ventilate via tube #1.
- Check for chest rise, auscultate the epigastric area for absence of abdominal sounds, and the lungs bilaterally for breath sounds.
- Attach Toomey to tube #2 and aspirate. If chest rise and bilateral breath sounds are present, no abdominal sounds noted, and there is resistance when aspirating with Toomey syringe, the tube is in the esophagus.
- Continue to ventilate through tube #1 and secure tube in place.
- If there is no chest rise, breath sounds, or abdominal sounds, and you are able to pull back freely on the Toomey syringe without resistance, the tube may be in the trachea.
- Ventilate via tube #2 and reassess for chest rise, breath sounds and abdominal sounds.
- If assessment confirms that tube is in trachea, continue to ventilate through tube #2 and secure tube in place.
- If unable to confirm tube placement, remove tube and ventilate with BVM attached to 100% oxygen.
- May reattempt Combitube placement twice, ventilating patient for 30 seconds between attempts.
- If unable to successfully place Combitube after three attempts, continue ventilations with BVM.

**PROBLEM SOLVING:**

- Air leaking from mouth/nose
  - Add 20mL air to cuff #1.
  - If still leaking add additional 20 mL of air to cuff #1.
  - If still leaking assume cuff leak and remove tube.
- Insertion too far into esophagus.
  - No chest rise or breath sounds, when ventilating via tube #1.
  - Unable to pull back on Toomey syringe.
  - Gurgling over abdomen , no chest rise, or breath sounds when ventilating via tube #2.
  - Deflate cuff #1, then cuff #2, pull back 3 cm, re–inflate cuff #1, then cuff #2.
- Possible asthma, COPD or drowning:
  - Poor chest rise while ventilating via tube #1.
  - Distant breath sounds.
  - Can't pull back on Toomey syringe.
  - No chest rise or breath sounds, gurgling over abdomen when ventilating via tube #2.
  - Toomey syringe and abdominal sounds may be most reliable assessments.
  - If no breath sounds or gurgling and can't aspirate with Toomey syringe–**Pull the tube**.
- Cardiac arrest:
  - May be able to continue CPR during attempts.
  - Maximum 30 seconds per attempt.
  - Only one attempt per one-minute cycle of CPR.
- Unusual circumstances:
  - Patient position (entrapment, arthritis of spine, patient cannot lie flat (supine).
  - Insertion may be attempted as long as ventilation & assessment can be completed.
- In rare situations, Toomey syringe can be relied upon solely.
  - Unilateral breath sounds with absent gastric sounds (unlikely to be right mainstemmed with Combitube):
  - Pneumothorax.
  - Hemothorax.
  - Pneumonectomy.
  - Leave Combitube in place and continue ventilation if Toomey syringe confirms location.
- Facial trauma:
  - If unable to visualize cords for ET insertion or unable to get mask seal with BVM, insert Combitube.
  - Suction prior to insertion.
  - Avoid broken teeth, bone fragments.
  - Maintain spinal stabilization.

**INDICATIONS FOR EXTUBATION:**

- Unable to confirm placement when ventilating via tube #1 or tube #2.
- Mechanical failure of tube.
- Patient actively resists tube.

**EXTUBATION PROCEDURE:**

- Consider decompressing stomach if tube in esophagus, using 12 fr catheter included in kit.
- Suction mouth if necessary.
- Deflate cuff #1 (100 cc)
- Deflate cuff #2 (15 cc)
- Turn patient on side.
- Remove tube with suction readily available.

**CONTRAINDICATIONS:**

- Obvious signs of death.
- Do-Not-Resuscitate.
- Gag reflex.
- Won't advance due to resistance.
- Known esophageal disease (cancer, varices, surgery).
- Known ingestion of caustic substance.
- Known narcotic OD (prior to Narcan administration).
- Laryngectomy patient with stoma.

**DOCUMENTATION:**

Documentation shall include:

- Presence of bilateral breath sounds.
- Verification that the esophageal detector device (Toomey syringe) indicated tracheal or esophageal placement.
- Which tube is being used to ventilate the patient, #1 or #2.
- Number of attempts required.
- Any procedural problems or complications.

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**APPROVAL**

**Bruce Haynes, M.D.**
**EMS Medical Director**

Date: 01/01/03

MEDICAL PROCEDURES

# EXTERNAL JUGULAR VEIN CANNULATION

**POLICY #7400**

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**INDICATIONS:**

- To establish IV access in critical adult and pediatric patients when unable to establish peripheral IV access.

**EQUIPMENT:**

- Iodine or alcohol preparation.
- Large gauge (#16 or #18) intravenous cannula.
- IV fluid and tubing.
- Adhesive tape.

**PROCEDURE:**

- Place patient in supine position.
- Elevate shoulders on rolled towel or sheet and suspend head and neck in hands of assistant.
- Turn patient's head 45° to 60° to one side.
- Cleanse venipuncture site with iodine preparation.
- Stimulate the pediatric patient to cry to cause engorgement of the vessel.
- Tamponade the vein with forefinger just above the clavicle, midclavicular line.
- Stabilize skin over vein with thumb.
- Puncture skin midway between angle of the jaw and midclavicular line, at a shallow angle. Align the needle and syringe in the direction of the vein and advance cannula.
- Maintain compression on the vein continuously with forefinger until cannula is completely inserted, needle has been removed, and IV tubing is connected. This keeps a closed system and prevents the possibility of air entering the vein.
- Release tamponade over vein and adjust IV flow to desired rate.
- Secure IV site.

**NOTES:**

- **Maximum two attempts permitted using one side only.**
- **Monitor for air embolism, catheter embolism, hematomas, or infiltration.**
- **Remove IV cannula immediately if a hematoma or infiltration occur and apply direct pressure until bleeding stops (approximately 5 minutes).**

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Approved:

Bruce Haynes, M.D.
EMS Medical Director

MEDICAL PROCEDURES

# NEEDLE THORACOSTOMY

**POLICY #7500**

**INDICATIONS:**

Rapidly deteriorating patient with severe respiratory distress who has signs and symptoms of life–threatening tension pneumothorax, such as:

- Progressively worsening dyspnea.
- Hypotension.
- Shock.
- Decreased or diminished breath sounds on the affected side.
- Distended neck veins.
- Tracheal deviation away from the affected side.

**PROCEDURE:**

- Base Hospital order required.
- Explain procedure to patient, place patient in upright position if tolerated.
- Assemble equipment:
  - 14 or 16 gauge 2 to 2½ inch needle and cannula with syringe attached. Use 20g, 1 inch needle and cannula for patients < 40 kg.
  - antiseptic wipes.
  - sterile 4 x 4's.
  - tape.
- Prepare area with antiseptic wipes at second intercostal space, midclavicular line.
- Insert needle perpendicular to the chest wall, at the level of the superior border of the third rib until needle is in contact with the rib. Maintain negative pressure on the syringe while inserting the needle.
- Maintain the needle in position, slowly 'walk' the needle with cannula over the **superior border** of the rib and advance until the pleural space is entered evidenced by one or more of the following:
  - a "popping" sound or "giving way" sensation
  - a sudden rush of air
  - ability to aspirate free air into the syringe
- Remove needle; leave cannula in place.
  **CAUTION:** Do not reinsert needle into cannula due to danger of shearing cannula.
- Evaluate the effectiveness of the procedure by:
  - immediate, obvious improvement in respiratory status, signs and symptoms, vital signs, and lung sounds.
- Secure the cannula with dressing and tape allowing cannula to remain in patient.
- If there is no improvement, this procedure may be repeated.

**APPROVAL:**

**Bruce Haynes, M.D.**
**EMS Medical Director**

# PRE-EXISTING VASCULAR ACCESS DEVICES (PVADs) POLICY #7600

I. Purpose: To define training requirements for Emergency Medical Technician-Paramedics (EMT-P) and utilization of Pre-Existing Vascular Access Devices (PVADs) in the prehospital setting.

II. Policy: Paramedics shall successfully complete the PVAD training module at an Imperial County EMS Training Institute or Base Hospital prior to administering fluids and/or medications through a PVAD in the field setting.

III. Definition: A pre-existing vascular access device is an indwelling catheter/device placed into one of the central veins to provide vascular access for those patients requiring long term intravenous therapy or Hemodialysis.

IV. Content:

A. Types of Catheters

1. External indwelling catheters/devices

a. **Heparin/Saline Lock** - A temporary venous catheter placed in a peripheral vein and occluded with a cap. Heparin or saline is instilled prior to capping the catheter to maintain its patency. It may be accessed directly through the injection cap.

b. "**BROVIAC@** catheter", "**HICKMAN@** catheter", "**GROSHONG@** catheter", and others - a long catheter that is inserted into the right atrium, through a central vein. The catheter enters the skin through an incision in the chest. The line may be heparinized and may be accessed directly through the injection cap. These catheters are usually multi-lumened and any lumen can be used. If the catheter is color coded, the red lumen is usually the largest.

c. **Peripherally inserted central catheter (PICC)** - a long catheter inserted antecubitally into the subclavian vein or superior vena cava. It may be accessed through the injection cap.

2. Internal, indwelling devices

a. **Internal Subcutaneous Infusion Ports** - an access device embedded subcutaneously and must be accessed through the skin. **THIS DEVICE IS NOT TO BE USED BY PREHOSPITAL FIELD PERSONNEL.**

b. **Internal Hemodialysis Fistula** - A permanent access device that diverts blood flow from an artery to a vein and is usually located in the forearm or femoral area. It is used for dialysis.

B. Indications

1. Heparin/Saline Lock - any situation requiring access for IV fluids or medications.

2. External Indwelling Catheters - Urgent need to administer fluids and/or medications, which can only be given by the IV route, and a peripheral IV site is not readily available.

3. Hemodialysis Fistula - Urgent need to administer fluids and/or medications, which can only be given by the IV route and an alternate IV site is not readily available.

C. Fluids/Medications approved for infusion through PVAD.

1. IV fluids: Normal Saline

2. Medications: All EMT -P scope of practice medications recommended for venous administration.

D. Complications

1. Infection. Due to the location of the catheter end, strict adherence to aseptic technique is crucial when handling these devices. The injection cap must be cleansed thoroughly with an alcohol wipe. Sterile gloves are not necessary.

Care must be used not to contaminate the needle used to access the line or the IV tubing used.

2. Air embolism. The devices provide a direct line into the circulation; therefore the introduction of air into the device is possible. Do not remove the injection cap from the catheter. Do not allow IV fluids to run dry. Clear all air from the IV tubing and syringes prior to administration of fluids or medications.

3. Thrombosis. Improper handling and maintenance of the device may dislodge a clot causing pulmonary embolus or vascular damage. Check patency of the line by slowly injecting 5 cc of NS (see Step 7 below). *Do not* inject medications or infuse fluids if resistance is met when establishing patency of the catheter. Flush line with 5 ml of normal saline after medication administration.

4. Catheter damage. These catheters are meant for long-term use. They usually require a surgical procedure and are costly to insert. Care must be taken to avoid any damage to the catheter. If damage to the catheter occurs, immediately clamp the catheter between the skin exit site and the damaged area to prevent air embolism or blood loss. Always use a 10 ml or larger syringe to prevent catheter damage from excess pressure when injecting directly. Use caution when inserting the needle into the injection port.

E. Procedure

1. Assemble necessary equipment – two (2) 10 cc syringes, NS for injection, IV tubing and fluid, alcohol wipes, 18 gauge needles or needleless system.

2. Disconnect any existing IV lines.

3. Prepare a 10 cc syringe with NS and set up IV line.

4. Prep injection cap with alcohol wipe.

5. Clamp catheter if unclamped.

6. Withdraw 5 cc's and discard syringe. If resistance is met, discontinue procedure.

7. Slowly inject 5 cc, if resistance is met, discontinue procedure.

8. Prep injection cap with alcohol wipe.

9. Attach 18-gauge needle or needless cap to IV tubing and insert into injection cap.
10. Regulate IV rate.
11. Tape needle to catheter to prevent dislodging.
12. Administer medications through IV line.
13. Flush line with IV fluid after medication administration.
14. Closely monitor IV line and Catheter.

**APPROVAL**

Bruce E. Haynes, M.D.
EMS Medical Director

# Rescue Airway - Perilaryngeal Airway (King LTD) POLICY# 7700

## I) PURPOSE:

The Perilaryngeal Airway Device (King LTD) is a single use piece of equipment intended for airway management. It can be used as a rescue airway when other airway management techniques have failed or as a primary device when advanced airway management is required in order to provide adequate ventilation. The Perilaryngeal airway does not require direct visualization of the airway or significant manipulation of the neck.

Its main use is in cardiac arrest situations (pulseless and apneic patients). In some patients it may be preferable to use initially (e.g. patients who are obese or with short necks, patients with limited neck mobility, difficult visualization due to access to the patient, or blood or emesis in the airway, during cardiac arrest to avoid interruption). It is not necessary to attempt endotracheal intubation before initiating the use of the perilaryngeal airway.

Because it is not tolerated well in patients with airway reflexes, it should not be used in responsive patients unless all other methods of ventilation have failed.

Two intubation attempts with the perilaryngeal airway are permissible. Ventilations should be interrupted no more than 30 seconds per attempt. Between attempts, patients should be ventilated with 100% oxygen for one minute via bag-valve mask device.

The King Airway is available in three sizes and cuff inflation varies by model:

A. Size 3 (yellow cap) – Patient between 4 and 5 feet tall (40 - 55 ml air)
B. Size 4 (red cap) – Patient between 5 and 6 feet tall (50 - 70 ml air)
C. Size 5 (purple cap) – Patient over 6 feet tall (60 - 80 ml air)

## II) INDICATIONS:

A. Cardiac arrest (of any cause)
B. Inability to ventilate non-arrest patient (with BLS airway maneuvers) in a setting in which endotrachael intubation is not successful or unable to be done.

## III) CONTRAINDICATIONS:

A) Presence of gag reflex
B) Caustic ingestion
C) Known esophageal disease (e.g. cancer, varices, stricture, others)
D) Laryngectomy with stoma
E) Height less than 4 feet

Note: Airway deformity due to prior surgery or trauma may limit the ability to adequately ventilate with this device (may not get adequate seal from pharyngeal cuff)

IV) EQUIPMENT:

A) Suction
B) King Kit (size 3,4, or 5)
C) Bag-Valve Mask
D) Stethoscope
E) End-tidal $CO_2$ detection device

V) PROCEDURE:

A) Assure an adequate BLS airway (if possible).
B) Select appropriately sized perilaryngeal airway.
C) Test cuff inflation by injecting recommended amount of air for tube size into the cuffs. Remove all air from cuffs prior to insertion
D) Apply water-based lubricant to the beveled distal tip and posterior aspect of tube, taking care to avoid introduction of lubricant in or near ventilation openings.
E) Have a spare perilaryngeal airway available for immediate use.
F) Oxygenate with 100% oxygen.
G) Position the head. The ideal head position for insertion is the "sniffing position". A neutral position can also be used (e.g. spinal injury concerns).
H) Hold mouth open and apply chin lift unless contraindicated by cervical spine injury or patient position.
I) With tube rotated laterally 45-90 degrees such that the blue orientation stripe is touching the corner of the mouth, introduce tip into mouth and advance behind base of tongue. **Never force the tube into position.**
J) As the tube tip passes under tongue, rotate tube back to midline (blue orientation stripe faces chin).
K) Without exerting excessive force, advance tube until base of connector aligns with teeth or gums.
L) Inflate cuff to required volume
M) Attached bag-valve to airway. While gently bagging the patient to assess ventilation, simultaneously withdraw the airway until ventilation is easy and free flowing.
N) Confirm proper position by auscultation, chest movement, and verification of $CO_2$ by Capnography. <u>Do not use esophageal detector device (EDD) with perilaryngeal airway.</u>
O) Secure the tube. Note depth marking on tube.
P) Continue to monitor patient for proper tube placement throughout prehospital treatment and transport. **Capnography should be done in all cases.**
Q) Document airway placement and results of monitoring throughout treatment and transport.

Troubleshooting:

R) If placement is unsuccessful, remove tube, ventilate with BVM and repeat sequence of steps.
S) If unsuccessful on second attempt, BLS airway management should be resumed.

**APPROVAL**

Bruce E. Haynes, M.D.
EMS Medical Director

# INTRAOSSEOUS INFUSION (PEDIATRIC and ADULT) POLICY # 7800

I. PURPOSE

Intraosseous cannulation provides a safe and reliable method for rapidly achieving a route for administration of medications, fluids, and blood products in a non-collapsible vascular space.

II. INDICATIONS

A. One failed attempt at intravenous access or after evaluation of potential IV sites, it is determined that an IV attempt would not be successful and patient meets one of the following criteria;

1. One of the following conditions exists:
    1. Cardiac or respiratory arrest, impending arrest, or unstable dysrythmia
    2. Shock or evolving shock, regardless of cause.

III. ABSOLUTE CONTRAINDICATIONS

A. Fracture or suspected vascular compromise of the selected tibia.
B. Congenital deformity or history of osteogenesis imperfecta or osteoporosis
C. Previous IO attempt at the chosen site
D. Inability to locate anatomical landmarks for insertion.
E. Patient <3kg

IV. RELATIVE CONTRAINDICATIONS

A. Skin infection or burn overlying the area of insertion.

V. EQUIPMENT

A. Povidone-based solution
B. IV of NS attached to 250 mL bag in pediatric patients
C. IV of NS attached to 1000 mL bag in adult patients
D. 10/12 mL syringe filled with normal saline
E. Sterile gloves
F. Adhesive tape
G. EZ Stabilizer
H. Pressure bag for IV fluid administration
I. Intraosseous needle (suitable up to age 8)

**-OR/AND-**

J. Automated IO insertion device (EZ-IOPD) up to 40 kg
K. Automated IO insertion device (EZ-IOAD) if over 40 kg
L. Lidocaine 2% for injection

VI. PROCEDURE

A. Locate and prepare the insertion site. For children, place supine with a rolled towel under the knee, restrain if necessary. Select extremity (if applicable) without evidence of trauma or infection.
B. Put on gloves and thoroughly prepare the area with the antiseptic solution.

C. Locate insertion site:
   i. In small children (3-12 kg), the tibial tuberosity cannot be palpated as a landmark, so the insertion site is two finger-breadths below the patella in the flat aspect of the medial tibia.

   ii. In larger children (13-39 kg), the insertion site is located on the flat aspect of the medial tibia one finger breadth below the level of the tibial tuberosity. If tibial tuberosity not palpable, insert two finger-breadths below the patella in the flat aspect of the medial tibia.

   iii. For adults, proximal or distal tibial sites may be utilized.
      1. The proximal tibial site is one finger-breadth medial to the tibial tuberosity.
      2. The distal tibial site is 2 finger-breadths above the medial malleolus (inside aspect of ankle) in the midline of the shaft of the tibia.

D. Stabilize extremity.
E. Introduce the intraosseous needle at a 90 degree angle, to the flat surface of the tibia.
F. For manual insertion, pierce the bony cortex using a firm rotary or drilling motion (do not move needle side to side or up and down). A distinct change in resistance will be felt upon entry into the medullary space.
G. Remove the stylet and confirm intramedullary placement by injecting, without marked resistance, 10 mL normal saline.
H. Attach IV tubing to the intraosseous hub.
I. Anchor needle to overlying skin with tape or EZ Stabilizer.
J. If unable to establish on first attempt, make on attempt on opposite leg, no more than two (2) attempts total.
K. Monitor pulses distal to area of placement
L. Monitor leg for signs of swelling or cool temperature which may indicate infiltration of fluids into surrounding tissues.
M. For adult patients who awaken and have pain related to infusion, <u>slowly</u> administer **SO - LIDOCAINE** 40 mg IO. May repeat dose once at 20 mg LIDOCAINE IO.
N. For pediatric patients with pain related to infusion, <u>slowly</u> administer **SO - LIDOCAINE** 0.5 mg/kg IO (max dose 20 mg).

VII. POSSIBLE COMPLICATIONS
A. Local infiltration of fluids/drugs into the subcutaneous tissue due to improper needle placement.
B. Cessation of the infusion due to clotting in the needle, or the bevel of the needle being lodged against the posterior cortex.
C. Osteomyelitis or sepsis
D. Fluid overload
E. Fat or bone emboli
F. Fracture

**APPROVAL**

Bruce E. Haynes, M.D.
EMS Medical Director

# CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) POLICY# 7900

I) PURPOSE:

A. The purpose of this policy is to define the indication and procedures required for the use of Continuous Positive Airway Pressure (CPAP) by paramedics.

II) INDICATIONS:

A. The purpose of CPAP is to improve ventilation and oxygenation in an effort to avoid intubation in patients who present with congestive heart failure (CHF) with acute pulmonary edema or other causes of severe respiratory distress.

B. CPAP is authorized for use in patients who are 14 years of age and older with any one of the following:
   1) Awake, alert and able to follow commands.
   2) Able to maintain a patent airway.
   3) Exhibit two or more of the following:
      (a) Respiratory rate > 24
      (b) Pulse Oximetry < 94%
      (c) Use of accessory muscles during respiration

C. Conditions in which CPAP may be helpful include suspected:
   1) Congestive Heart Failure (CHF) with acute pulmonary edema.
   2) Acute exacerbation of COPD or asthma.
   3) Near drowning/submersion
   4) Other causes of severe respiratory distress, <u>excluding</u> trauma

III) CONTRAINDICATIONS:

A) Absolute Contraindications (Do Not Use):
   1) Respiratory or cardiac arrest
   2) Agonal/failing respirations
   3) Inability to maintain airway
   4) Altered Mental Status - can't cooperate
   5) Systolic blood pressure <90mmHg
   6) Signs and symptoms of pneumothorax
   7) Major facial, head or chest trauma
   8) Facial abnormalities or inability to obtain a mask seal
   9) Tracheostomy
   10) Unconsciousness
   11) Vomiting

B) Relative Contraindications (Use Cautiously):
   1) Claustrophobia or unable to tolerate mask

IV) EQUIPMENT:
A) CPAP pressure generator and circuit set with ability to deliver 5.0 cm to 10 cm of $H_20$ pressure
B) Appropriate sized face mask and straps
C) Inline nebulizer if required for bronchodilator administration
D) Sufficient oxygen supply

V) PROCEDURE:
A) Place patient in a seated position.
B) Monitor ECG, Vital Signs (BP, HR, RR, $SpO_2$)
C) Monitor vital signs every five (5) minutes; $SpO_2$ must be used continuously to monitor patients oxygen saturation
D) Set up the CPAP system (per manufacturers recommendation) with pressure set at 5-10 cm H20 (Pulmodyne® O2-RESQ™, Boussignac and WhisperFlow)
E) Explain to the patient what you will be doing
F) Verify that oxygen is flowing to the mask. Apply mask while reassuring patient – encourage patient to breathe normally (may have a tendency to become anxious or panic – reassure and coach)
G) Do not exceed 10 cm of $H_2O$ pressure
H) Reevaluate the patient – normally the patient will improve in the first 5 minutes with CPAP as evidenced by:
   1) Decreased heart rate
   2) Decreased respiratory rate
   3) Decreased blood pressure
   4) Increased SpO2
I) If the patient does not improve or becomes worse with CPAP, remove the CPAP device and assist ventilations with BVM as needed
J) Notify the receiving facility of the type of CPAP device that is being used

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**APPROVAL**

Bruce E. Haynes, M.D.
EMS Medical Director