

Windsor Heights Fire Department Emergency Medical Services

EMS PROTOCOL & PROCEDURE SUPPLEMENT

FIRST RESPONDER, EMT-B, EMT-P, AND PS

(ADULT & PEDIATRIC)



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EMS PROCEDURE SUPPLEMENTS

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Windsor Heights Fire Department EMS Procedure Authorization

Adopted: September 2006

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Procedure 1 CombiTube®

- 1) Perform scene size-up.**
Use proper body substance isolation. Gloves are needed when there is a potential of contacting blood or body fluids; gowns are needed when large splash situations are likely, e.g., childbirth or major trauma; masks and eye protection are needed in situations when there is potential for blood or body fluid spatter. Assess scene safety, trauma (MOI) or medical (NOI), and number of patients. In cases of oral tracheal intubation gloves, mask, and eye protection are needed.
- 2) Perform initial assessment.**
Assess the general impression of patient, chief complaint, responsiveness, airway, breathing, and circulation status. Apply high flow oxygen, begin treatment for life-threatening injury/illness, if needed, and make transport decision based upon initial assessment.

Indications: The Combitube® is used for adult patients who are unconscious, apneic, and have no gag reflex.

Contra-indications: Never insert the Combitube® in a patient who is conscious with a gag reflex, who is under the age of 16, less than five feet in height (individual patient anatomy may vary sufficiently to warrant using a small adult Combitube® if available for a person who is 4-5 feet tall), who has swallowed a corrosive substance, or who has known esophageal disease.
- 3) Gather and prepare necessary equipment.**
The necessary equipment for CombiTube® insertion includes the CombiTube®, 150 (140) ml syringe, 20 (12) ml syringe, water soluble lubricant, and stethoscope. Inflate and check both the distal cuff (10- 15 (10-12) cc of air) and the pharyngeal balloon (100 cc of air) for proper functioning. Lubricate the distal end of the tube with water-soluble lubricant.
- 4) Position for Combitube® tube insertion.**
Position the patient's head in a neutral or slightly flexed position if no suspected spinal injury (if a spine injury is suspected, maintain a neutral, in-line head position). Position yourself at the head of the patient (your left should also be the patient's left) with the assembled Combitube® equipment.
- 5) Insert the Combitube®.**
Gently grasp the patient's lower jaw with the thumb and index finger of your non-dominant hand, lifting slightly upward. Holding the Combitube® in your dominant hand blindly insert the Combitube® into the midline of the mouth and pharynx following the normal curvature. Advance tube until the black measurement rings are aligned with the patient's teeth or the alveolar ridges. Never force the device; if it does not advance, simply readjust the insertion.
- 6) Inflate the pharyngeal balloon.**
Using the larger syringe, inject 100 (85) cc of air into the pharyngeal balloon or blue pilot valve. The device may move slightly as the Combitube® seats itself within the posterior pharynx.
- 7) Inflate the distal cuff.**
Using the 20 (12) cc syringe, inject 15 (12) cc of air into the distal cuff (white pilot valve) or until resistance is felt.
- 8) Ventilate the patient using the #1 external tube.**
The external tube marked #1 will be longer than tube #2. In most cases the Combitube® will be inserted into the esophagus. Always listen for breath sounds in the lung apices and bases, as well as over the epigastrium. If the tube is placed properly, there should be breath sounds in the lungs and no sound over the epigastrium.
- 9) Ventilate using the #2 external tube.**
If there is an absence of breath sounds and positive sounds over the epigastrium, use the smaller #2 external tube. This will mean the tube is in the trachea. Once switched, again listen for breath sounds in the apices and bases of the lungs and over the epigastrium.

- 10) Ventilate with 100 percent oxygen and bag-valve.**
Once tube placement is confirmed, ventilate the patient with high-flow oxygen at an appropriate rate. Always reassess and allow for exhalation between ventilations.
- 11) Continually assess tube placement.**
Since there is always a possibility for the tube to slip from its position or be incorrectly placed, after every major patient movement the tube's placement should be reevaluated by reassessing lung sounds and over the epigastrium.
- 12) Continue with further assessments.**
Because securing the airway is most important, further assessment may not take place until after securing the airway. It may be necessary to complete the initial, focused, detailed, and on-going assessments after oral tracheal intubation.
- 13) Remove tube, if indicated.**
It may be necessary to remove the tube if the patient regains consciousness and begins to breathe on his/her own. In these cases, make sure a large bore suction catheter and suction unit are available. Never remove a tube unless the patient has resumed breathing on his/her own. If no spinal injury, turn the patient onto the left side and deflate all cuffs. In a smooth motion, remove the tube from the oropharynx. Be alert for vomiting and suction the oropharynx.
- 14) Document assessments and emergency care.**
All assessments and emergency medical care need to be documented on the PCR for any trends the patient may present and any improving or worsening conditions. The procedure should be documented on the PCR. The PCR serves as a medical and legal document for the emergency call.

Procedure 2 Glucose Monitoring

Services that choose to provide Glucose Monitoring shall follow the guidelines set out by the Clinical Laboratory Improvement Amendment (CLIA) and follow a protocol approved by the service program's medical director. To order a C.L.I.A. waiver form call 319-335-4500.

Perform a blood glucose test in accordance with the manufacturer's recommendations for device operation.

Procedure 3 Intraosseous Infusion

Indications: A qualified EMS provider* may use this skill for patients in whom venous access is impossible after 90 seconds or 3 IV attempts in a life threatening situation. When cardiopulmonary arrest is present, 3 IV attempts are not necessary. Proceed directly to Intraosseous.

Contraindications: Fractured bones, previous attempts and any other known imperfection of the bone.

Procedure/Treatment:

1. Identify insertion site and cleanse the skin with Betadine.
2. Insert the needle at the appropriate angle to avoid the epiphyseal plate. A twisting or boring motion should be utilized to overcome resistance of the cortex.
3. Advance the needle, feeling a "pop" and lack of resistance of needle passing through the cortex.
4. Remove the stylet and attempt to aspirate bone marrow into a saline filled syringe.
 - a) Inject 2-5 cc of saline to verify placement and flush away clots and/or marrow blocking the needle. Observe for any swelling at the site.
5. Verify placement further by the needle standing in position without support. Stabilize needle with gauze and tape.
6. Connect IV fluids to the site and run the fluid looking for signs of infiltration. Use connecting tubing between IV and needle.
7. Multiple punctures at a site should not be attempted.

***Qualified EMS provider:** A certified paramedic who has demonstrated skills necessary to competently perform this procedure and has the approval of the medical director.

Procedure 4

Maintenance of Non-medicated IV's

I. DISCONTINUING AN IV:

A. Procedure

1. Advise or receive orders from medical direction to discontinue IV.
2. Take appropriate BSI precautions.
3. Explain procedure to the patient and/or family members.
4. Turn off IV fluid by closing pressure wheel on administrative tubing.
5. Remove tape and other securing material from IV tubing and catheter.
6. Remove IV catheter and administration tubing still connected.
7. Cover the puncture site with an alcohol wipe, 2x2, or 4x4 and hold pressure until bleeding stops.
8. Cover wound with appropriate dressing (Band-Aid).
9. Discard IV administration set, fluid, and catheter in an approved fashion.
10. Document discontinuance of IV.

II. CHANGING IV FLUIDS:

A. Rational

1. During long distance transfers.
2. Change of fluids by medical direction.

B. Procedure

1. Check orders/authorization for change of IV fluids from medical direction.
2. Check for correct IV fluid.
3. Take appropriate BSI precautions.
4. Prepare new IV solution, remove covers.
5. Turn off IV flow rate by closing pressure wheel on administration tubing.
6. Invert IV container, remove the IV container to be changed from the administration set, maintaining a sterile environment.
7. Invert the new solution container; puncture the replacement solution container with spike of administration set.
8. Turn IV container over (upright).
9. Fill drip chamber of administration set to marked line if needed.
10. Adjust IV flow rate to desired amount.
11. Reassess IV site and flow.
12. Discard used IV container in an appropriate manner.
13. Document procedure.

C. Precautions

1. Do not allow an IV to "run dry".
2. If the drip chamber is empty, will need to "bleed" air from the tubing before adjusting the IV flow rate.

Procedure 5 MAST/PASG Application

Indications: A qualified EMS provider* may use this skill for the following:

- A. To stabilize lower extremity or pelvic fractures.
- B. To control bleeding of large lower extremity lacerations.

Contraindications:

Do not use on patients with pulmonary edema, congestive heart failure or cardiogenic shock.

Procedure/Treatment:

1. Contact medical direction for order to apply MAST/PASG.
2. Use one of the standard application procedures of the MAST/PASG, taking precautions to protect the spine or extremity injuries.
3. Cut the patient's pants off and remove shoes.
4. Wrap legs and abdomen snugly with Velcro straps.
5. Attach the tubing to each of the three compartments and foot pump.
6. Make sure valve stems are in the open position (in line with the tubing).
7. Pump trouser up until one of the following occurs.
 - a. BP rises to above 100 mm systolic.
 - b. Velcro straps slip and/or pop-off valve releases.
 - c. Trousers indent with firm pressure.
8. Uneven compartment filling can be compensated for by turning off the valve to filled compartments.
9. Note the time of the MAST/PASG inflation.
10. Monitor vital signs, especially the blood pressure, every five minutes until arrival to the ER.
11. **DO NOT DEFLATE MAST!** In the event that respiratory distress develops after inflation, contact medical direction for further orders.
12. Upon arrival to the ER, provide the nurse and/or doctor with the time of inflation and the vital signs before and after inflation.

***Qualified EMS provider:** A certified EMT-B, EMT-I or Paramedic/Paramedic Specialist who has demonstrated the skills necessary to competently perform this procedure and has the approval of the medical director.

Procedure 6 Needle Thoracostomy

Indications: A qualified EMS provider* may use this skill for respiratory compromise associated with one or more of the following:

1. Tension Pneumothorax.
2. Absent or greatly decreased breath sounds over the hemithorax area.
3. Trachea shifted to unaffected side and/or JVD.
4. Subcutaneous emphysema.
5. Multiple rib fractures.

Procedure/treatment:

1. Expose and cleanse anterior chest at level of the 2nd intercostal space on the affected side.
2. Find 2nd intercostal space midclavicular line with gloved finger.
3. Using 14 gauge over-the-needle catheter and syringe attached direct needle over the third rib into the 2nd intercostal space.
4. Apply enough pressure to push the needle through the intercostal muscle and into the pleural cavity.
5. You should pull back air in the syringe or if no syringe on the needle you should hear a rush of air, either of these should be considered a positive placement.
6. Remove the needle leaving the catheter in place and securing with tape.
7. Connect to one-way valve.
8. Assess patient for improvement in status.

***Qualified EMS provider:** A certified paramedic/paramedic specialist who has demonstrated the skills necessary to competently performs this procedure and has the approval of the medical director.

Procedure 7 Pulse Oximetry Procedure

Scope of Practice:

Indications:

Contraindication:

Application of the pulse oximeter is not a priority in the initial management of the critically ill or injured patient. The pulse oximeter can be used to help monitor the patient's oxygenation after the usual procedures to stabilize the patient are completed (ABC's management).

Procedure/Treatment:

1. Start treatment based on initial assessment to stabilize the patient while applying pulse oximeter.
2. Position patient comfortably and support dependent extremity to be used for monitoring.
3. Remove finger nail polish. Polish can falsely alter saturation.
4. Attach sensor probe to finger or bridge of nose. May also use the earlobe or toes.

Potential problems:

1. Inaccuracy if O₂ saturation less than 70%.
2. Possible interference with ambient light.
3. Presence of carboxyhemoglobin will produce normal reading in the presence of severe tissue hypoxemia.
4. Measurements can be difficult to get in the presence of vasoconstriction, hypotension and anemia.

Procedure 8

Medication Assisted Intubation

Scope of Practice:

EMT-P
Paramedic Specialist
Critical Care Paramedic

Indications:

1. Failure to maintain or protect airway.
2. Failure of ventilation or oxygenation.
3. A condition is present or therapy is required that mandates intubation of a patient with an intact gag reflex and or a patient that is combative; (smoke inhalation, neck trauma, status epilepticus, etc)

Contraindications:

1. Patients in whom cricothyrotomy would be difficult.
 - a. Massive neck swelling/open wounds.
 - b. Congenital anatomic abnormalities, i.e.: cleft palate, Down's syndrome, etc.
2. Patients who would be difficult to intubate/ventilate after sedation.
 - a. Acute epiglottitis
 - b. Upper airway obstruction
 - c. Significant facial edema, trauma, or fractures.
3. Hyperkalemia
4. Penetrating eye injuries.
5. Known hypersensitivity to the drug of use.
6. Unstable fractures that may be displaced by fasciculations.
7. History of malignant hyperthermia.
8. Known pesudocholinesterase deficiency.

Procedure:

1. Preoxygenation
 - a. Administer 100% oxygen via non-rebreather mask for 5 minutes in spontaneously breathing patient; if urgent, have patient take at least 4 deep breaths.
 - b. Do not manually ventilate the patient as this may result in gastric distention resulting in vomiting and aspiration, unless respiratory effort is ineffective.
2. Clinical assessment, history.
3. IV X 2, fluid rate per clinical assessment.
4. Oxygen/adjunct per clinical assessment.
5. Cardiac and Pulse Oximetry monitoring.
6. **Medications(s)**
 - a. **Versed**
 - i. **2 mg** IVP over 10-20 seconds with 1 mg increments at 2 minutes.
 - b. **Etomidate**
 - i. **0.3-0.5 mg/kg**
 - ii. (Max dose of 40 milligrams may be exceeded depending on patient's weight.)
7. Apply cricoid pressure.
8. Sellick maneuver.
9. BVM ventilation should not be initiated unless patient is unable to maintain SpO₂ >90%.
10. Intubate. If unable during first 20-second attempt, return to BVM ventilation for 30-60 sec.
11. Intubate. If repeated intubation attempts fail, ventilate with BVM and consider the placement of CombiTube/cricothyrotomy.
12. Treat bradycardia that occurs during the intubation process with **Atropine 0.01 mg/kg** IVP (minimum dose of 0.15 mg) and hyperventilate with 100% oxygen.

13. Confirm placement of ET tube.
14. Release Cricoid pressure. Secure tube.

Adoption:

Date: November 15, 2004

Revised Date: November 29, 2007

Medical Director Signature: _____

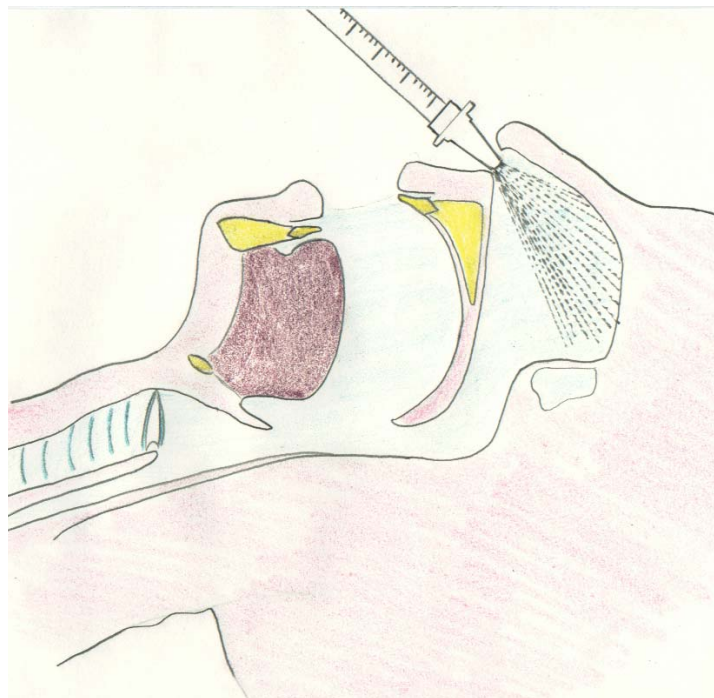
Procedure 9 Intranasal Medication Administration

1. Prepare equipment for medication administration
2. Remove atomization device from syringe
3. Fill syringe with desired volume of medication
4. Remove excess air from syringe
5. Replace atomization device on syringe
6. Wedge atomization device firmly into nostril
7. Firmly deploy half of the desired volume into nostril
8. Switch nostrils and firmly deploy remainder

Place no more than 0.5 to 1.0 cc of fluid in each nostril

Absorption may be adversely effected by:

1. Nasal Congestion
2. Epistaxis
3. Rhinorrhea
4. Abnormal nasopharyngeal anatomy



Procedure 10

Difficult intubation protocol:

Use of the endotracheal tube introducer (gum-elastic bougie)

Description

The Eschmann tracheal tube introducer (formerly known as the gum elastic bougie) is a 60cm long, 15 French Gauge flexible device with a J angle at its distal tip. During use a curve is also formed towards its distal end. The device should be clinically clean prior to use but does not need to be sterile. Both re-usable and disposable versions are available.

Rationale for use

The tracheal tube introducer is used to facilitate difficult intubation. It should not be confused with the more rigid stylet, which is inserted into the ET tube and used to alter its shape prior to intubation. Unlike the stylet a bougie is inserted independently of the ET tube and is used as a guide. Since the bougie is considerably softer, more malleable, and blunter than a stylet this technique is considered to be a relatively atraumatic procedure.

Indications

Difficult intubation with a restricted view of the glottic opening. This may occur due to:

- Short, thick (bull) neck;
- Pregnancy;
- Laryngeal edema (anaphylaxis, burns);
- Normal anatomical variation;
- Supra-glottic neoplasms (tumors above the glottic opening);
- Inability to position patient appropriately (e.g. entrapment, confined space).

Contraindications

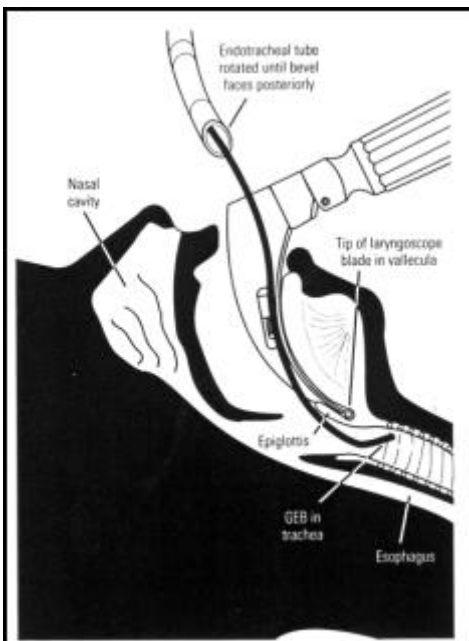
- Pediatric patients under the age of 14.

Method

Where a difficult intubation is anticipated, or a poor view of the glottic opening has been confirmed on laryngoscopy:

- 1) Hyperventilate the patient with 100% oxygen for at least one minute prior to each intubation attempt. Note, however, that this step should be omitted when ventilation (demonstrated by rise and fall of the chest) proves impossible.
- 2) Prepare the ET tube and other intubation equipment.
- 3) Prepare the endotracheal tube introducer for use:
 - a) Curve the bougie and ensure the distal tip is formed into a "J" shape;
 - b) Perform a laryngoscopy, obtaining the best possible view of the glottic opening.
 - c) Advance the bougie, continually observing its distal tip, with the concavity facing anteriorly;
 - d) Visualize the tip of the bougie passing the vocal cords.

- e) Once the tip of the bougie has passed the epiglottis, continue to advance it in the mid-line so that it passes behind the epiglottis but in an anterior direction (figure 1);
 - f) As the tip of the bougie enters the glottic opening you will either feel 'clicks' as it passes over the tracheal rings or the tip will arrest against the wall of the airways ('hold-up'). This suggests correct insertion, although cannot be relied upon to indicate correct positioning with 100% accuracy. **HOWEVER, FAILURE TO ELICIT CLICKS OR HOLD-UP IS INDICATIVE OF ESOPHAGEAL PLACEMENT.** If hold-up is felt, the bougie should then be withdrawn approximately 5cm to avoid the ET tube impacting against the carina.
 - g) Hold the bougie firmly in place **AND MAINTAIN LARYNGOSCOPY.**
 - i) Instruct your colleague to pass the endotracheal tube over the proximal end of the bougie.
 - ii) As the proximal tip of the bougie is re-exposed, the assistant should carefully grasp it, assuming control of the bougie and passing control of the ET tube to the intubator.
 - iii) The ET tube should then be carefully advanced ('rail-roaded') along the bougie and hence through the glottic opening, taking care to avoid movement of the bougie.
 - iv) **SUCCESSFUL INTUBATION MAY BE CONSIDERABLY ENHANCED BY ROTATING THE ET TUBE 90°, SO THAT THE BEVEL FACES POSTERIORLY.** In so doing the bougie may also rotate along the same plane but should not be allowed to move up or down the trachea.
 - h) Once the ET tube is fully in place hold it securely as your colleague withdraws the bougie.
 - i) Withdraw the laryngoscope.
- 4) Inflate the cuff. Then verify correct positioning of the ET tube using auscultation of the lung fields and epigastrium and observing for chest wall movement.
 - 5) Tie the tube securely into place. The tip of the ET tube can move up to 6.0 cm once placed and this is certainly sufficient to dislodge it from the trachea.



*Figure 1: Technique for using tracheal tube introducer (Nocera, A. A flexible solution for emergency intubation difficulties. *Ann Emerg Med*, 1996; 27(5):665-667.)*

Procedure 11

EZ-IO Adult and Pediatric

Indications:

EZ-IO Adult: 40kg and greater

EZ-IO Pediatric: 3 to 39 kg

1. Immediate vascular access in emergencies.
2. Intravenous fluid or medications are urgently needed and a peripheral IV cannot be established in two attempts or 120 seconds and the patient exhibits one or more of the following:
 - a. An altered mental status (GCS less than or equal to eight)
 - b. Respiratory compromise (SaO₂ 90% after appropriate oxygen therapy, respiratory rate < 10 or >40 per minute)
 - c. Hemodynamic instability (Systolic Blood Pressure of <90).
3. EZ-IO Adult and Pediatric should be considered PRIOR to peripheral IV attempts in the following situations:
 - a. Cardiac arrest (medical or traumatic)
 - b. Profound Hypovolemia with alteration of mental status
 - c. Patient in extremis with immediate need for delivery of medications and/or fluids.

Contraindications:

1. Fracture of the bone selected for IO infusion (consider alternate site)
2. Excessive tissue at insertion site with the absence of anatomical landmarks (consider alternate site)
3. Previous significant orthopedic procedures (IO within 24 hours, prosthesis-consider alternate tibia)
4. Infection at the site selected for insertion (consider alternate site)

Considerations:

Flow rate: Due to anatomy of the intraosseous space, flow rates may appear to be slower than those achieved with an IV catheter.

- Ensure the administration of an appropriate rapid Syringe Bolus or flush prior to infusion. NO Flush = No Flow.
 - Adult flush: 10ml of normal saline
 - Pediatric flush: 5ml of normal saline
 - Repeat flush as needed

- To improve continuous infusion flow rates always use a syringe, pressure bag or infusion pump

Pain: Insertion of the EZ-IO in conscious patients has been noted to cause mild to moderate discomfort. Infusion of the EZ-IO for conscious patients has been noted to cause severe discomfort.

- Prior to IO flush or continuous infusion in alert patients, slowly administer Lidocaine 2% (preservative free) through the EZ-IO hub. Verify that the patient has no allergies or sensitivity to Lidocaine.
 - Adult: slowly administer 20 to 40 mg Lidocaine 2% (preservative free)
 - Pediatric: slowly administer 0.5 mg / kg Lidocaine 2% (preservative free)

Precautions:

The EZ-IO is not intended for prophylactic use

Equipment:

EZ-IO Driver
EZ-IO Adult or Pediatric Needle Set
Alcohol
EZ-Connect or Standard Extension Set
10ml syringe
0.9% Sodium Chloride (Normal Saline)
Pressure Bag or Infusion Pump
Lidocaine 2% (preservative free)
EZ-IO yellow wristband

Procedure: *If the patient is conscious, advise of Emergent Need for this procedure and obtain informed consent.*

1. Wear approved Body Substance Isolation Equipment (BSI)
2. Determine EZ-IO Adult and / or Pediatric Indications
3. Rule out Contraindications
4. Locate appropriate insertion site (Multiple sites are FDA cleared including – Proximal / Distal and Proximal Humerus)
5. Prepare insertion site using aseptic technique.
6. Prepare the EZ-IO driver and appropriate needle set.
7. Stabilize site and insert appropriate needle set
8. Remove EZ-IO driver from needle set while stabilizing catheter hub
9. Remove stylet from catheter, place stylet in shuttle or approved sharps container
10. Confirm placement
11. Connect primed EZ-Connect
12. Slowly administer appropriate dose of Lidocaine 2% (preservative free) IO to conscious patients
13. Syringe bolus / flush the EZ-IO catheter with the appropriate amount of normal saline
14. Utilize pressure (syringe bolus, pressure bag or infusion pump) for continuous infusions where applicable
15. Begin infusion
16. Dress site, secure tubing and apply wristband as directed
17. Monitor EZ-IO site and patient condition- remove catheter within 24 hours.

Procedure 12
King LTS-D ®

Will be completed at a later date.