

	COUNTY OF SACRAMENTO EMERGENCY MEDICAL SERVICES AGENCY	Document #	8802.06
	<u>PROGRAM DOCUMENT:</u> Intraosseous Infusion	Draft Date:	01/11/07
		Effective:	11/01/16
		Revised:	07/28/16
		Review:	03/01/18

 EMS Medical Director

 EMS Administrator

Purpose:

- A. To serve as an advanced life support skill guideline for Intraosseous (IO) infusion.

Authority:

- A. California Health and Safety Code, Division 2.5
- B. California Code of Regulations, Title 22, Division 9

Indications:

- A. The preferred site for infusion is a peripheral vein. Before an IO attempt is considered, it will be ~~ascertained~~ **determined** that peripheral sites are not available. ~~and that no preexisting venous access device, central line, PICC line, or tunneled catheter, is available.~~ This information will be documented on the patient care report.
- B. Adult and pediatric patients who are unable to be successfully intravenously cannulated and who need administration of medication or intravenous (IV) fluids for:
 - 1) Cardiac Arrest
 - 2) Patients in extremis who have IMMEDIATE LIFE-SAVING NEED for IV medication or fluids (critical trauma patients)
 - 3) When indicated by protocols

Contraindications:

- A. Recent ~~fracture~~ **or suspected fracture** of involved **target** bone.
- B. Infection at the site selected for insertion.
- C. Excessive tissue or **severe obesity** at insertion site, **and/or inability to identify** with the ~~absence of~~ anatomical landmarks.
- D. Previous significant orthopedic procedures in insertion area (**prosthetic limb or joint**).
- E. Previous IO within forty-eight (48) hours on that extremity.

Special Precautions:

- A. IO lines will NOT be established as precautionary. Only patients who have an IMMEDIATE need for an IO medication and who are in extremis when peripheral venous access cannot be obtained shall undergo intraosseous cannulation.
- B. All other uses of the IO route require a base **hospital** order.

Equipment:

- A. EZ-IO® Driver.
- B. EZ-IO® Adult 15mm, 25mm and 45mm Needles.
- C. Antiseptic Solution.
- D. EZ-Connect® extension set.
- E. 10 ml Syringe.
- F. Normal Saline (or suitable sterile fluid).
- G. Pressure Bag or Infusion Pump.
- H. IO Device Stabilize.

Insertion Sites:

Adults	Pediatrics
Proximal Humerus Proximal Tibia Distal Tibia	Proximal Tibia Proximal Humerus Distal Tibia

Procedure:

- A. Assemble the needed equipment and don gloves.
- B. Fill syringe with normal saline, keeping the needle tip sterile.
- C. **Prime EZ-Connect.**
- D. Locate an appropriate insertion site: **IO site selection depends on patient age, size, anatomy, presenting condition, and ability to locate anatomical landmarks.**
 - 1. Non-traumatized Humerus:
 - a) **The insertion site is located on the greater tubercle of the humeral head, identifiable as a prominence on the humerus when the arm is rotated inward and the patients hand is on the abdomen. ~~The insertion site is located on the greater tubercle of the humeral head, of the humeral head, age greater than or equal to five (5) years old.~~**
 - 2. Non-traumatized Proximal Tibia:
 - a. **Adult- Extend the leg. Insertion site is approximately 2 cm medial to the tibial tuberosity, or approximately 3 cm below the patella and approximately 2 cm medial, along the flat aspect of the tibia. ~~Locate the insertion site medial to the tibial tuberosity two (2) finger breadths below the patella on the anteromedial flat bony surface of the proximal tibia.~~**
 - b. **Infant / Child- Extend the leg. Pinch the tibia between your fingers to identify the medial and lateral border of the tibia. Insertion site is approximately 1 cm medial to the tibial tuberosity, or just below the patella (approximately 1 cm) and slightly medial (approximately 1 cm), along the flat aspect of the tibia.**
 - 3. ~~Non-traumatized Humerus~~ ~~The insertion site is located on the greater tubercle of the humeral head, age greater than or equal to five (5) years old.~~
 - 4. Non-traumatized Adult Distal Tibia:
 - a. **Adult- Insertion site is located approximately 3 cm (2 finger widths) proximal to the most prominent aspect of the medial malleolus. Palpate the anterior and posterior borders of the tibia to assure that your insertion site is on the flat center aspect of the bone.**

- b. Infant / Child- Insertion site is located approximately 1-2 cm (1 finger width) proximal to the most prominent aspect of the medial malleolus. Palpate the anterior and posterior borders of the tibia to assure that your insertion site is on the flat center aspect of the bone.

*For tibia access, aim the needle set tip at a 90-degree angle to the bone.

~~Adult is defined as age greater than or equal to fifteen (15) years old. On the distal tibia, locate the insertion site two (2) fingerbreadths proximal to the medial malleolus.~~

- E. Prepare the site. Position the patient so that the site is accessible. Scrub insertion site. Prepare the EZ-IO® driver and appropriate needle set as follows: **based on patient anatomy, weight and tissue depth:**
1. 15mm (Pink) – Patients Commonly 3 -39 Kg
 2. *25mm (Blue) - Patients 40 \geq 3Kg* or greater
 3. 45mm (Yellow) - Patients greater than 40 Kg * with excessive tissue or placement in the humeral head.
- * **The needle sets do not have “adult” or “pediatric” sizes. Clinical judgment should be used to determine appropriate needle set selection based on patient weight, anatomy and tissue depth (skin, adipose and muscle thickness) overlying the insertion site. Consider tissue density when selecting size of IO needle.**
- F. Insert the appropriate IO needle.
1. Stabilize site and insert appropriate needle set.
 2. Remove EZ-IO® driver from needle set while stabilizing catheter hub.
 3. Remove stylet from catheter, dispose of stylet in sharps container.
 4. Attach primed side port extension set (EZ-connect) to IO hub.
 5. Attempt to confirm IO placement by aspirating a small amount of bone marrow into the extension tubing (may not get return).
 6. Flush the IO needle with 10ml of Normal Saline (NS) in an adult (5ml in a pediatric/neonate) via the extension set using a syringe.
- G. In a **conscious** adult patient with a response to pain, ~~administer:~~ **flush the IO with 2 ml of 2% Lidocaine (40mg) via IO slowly** at a rate of **1-2 minutes** ~~seconds/ml (slowly).~~
1. Wait ~~15-30~~ **60** seconds then give 10cc Normal Saline flush via IO.
 2. 1ml of 2% Lidocaine (20mg) via IO.
- (Third degree heart block is a contraindication to Lidocaine administration)
- H. In a conscious pediatric patient **responsive to pain**, ~~weighing less than 50 kg and less than fifteen (15) years of age administer~~ **administer 0.5 mg/kg of 2% preservative free Lidocaine, not to exceed 40mg, via IO slowly over 1-2 minutes**
1. **Flush with 5 ml saline.**
- I. Administer appropriate medication using a syringe or preload as appropriate.
- J. Utilize pressure (pressure bag or infusion pump) for continuous intraosseous infusions.
- K. Dress site and secure tubing.
- L. Monitor IO site and patient condition.

Special Notes:

- A. There will be only one attempt per extremity at establishing an IO infusion.
- B. No more than two (2) total attempts will be allowed for IO infusion.
- C. Scene time will not be delayed for IO infusion attempts.
- D. Generally, make one attempt at scene; the second enroute.
- E. Any deviation from one attempt on scene only, must be documented as to the reason.