

# SIERRA-SACRAMENTO VALLEY EMS AGENCY PROGRAM POLICY

REFERENCE NO. 1101

## SUBJECT: INTRAOSSEOUS INFUSION

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### **PURPOSE:**

To provide an alternative technique for establishing vascular access in critical adult and pediatric patients when peripheral IV access is difficult or time-sensitive.

### **AUTHORITY:**

Health and Safety Code 1797.220 and 1798

California Code of Regulations, Title 22, Division 9, Section 100169

### **INDICATIONS:**

- A. Intraosseous infusion is indicated in emergency situations when life-saving fluids or drugs should be administered and IV cannulation is difficult, impossible or too time-consuming to perform.
- B. If a peripheral IV cannot be established after two attempts or within 60-90 seconds of elapsed time.
- C. For adult and pediatric patients, weighing 3 kg or more, who present with one or more of the following clinical conditions:
  - 1. Cardiac arrest
  - 2. Hemodynamic instability (B/P <90 mmHg and clinical signs of shock)
  - 3. Imminent respiratory failure
  - 4. Status epilepticus with prolonged seizure activity greater than 10 minutes, and refractory to IN / IM anticonvulsants
  - 5. Toxic conditions requiring immediate IV access for antidote
- D. IO placement may be considered prior to peripheral IV attempts in cases of cardiopulmonary or traumatic arrest, in which it may be obvious that attempts at placing an IV would likely be unsuccessful or too time consuming, resulting in a delay of life-saving fluids or drugs.

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**Effective Date: 12/01/2011**  
**Next Review Date: 09/2014**  
**Approved:**

**Date last Reviewed / Revised: 09/11**  
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**SIGNATURE ON FILE**  
**S-SV EMS Medical Director**

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**S-SV EMS Regional Executive Director**

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**CONTRAINDICATIONS:**

- A. Fracture or suspected vascular compromise of the selected tibia or humerus.
- B. Previous significant orthopedic procedures (IO within 24 hours; prosthesis).
- C. Inability to locate anatomical landmarks for insertion.
- D. Skin infection overlying the area of insertion.

**SITE SELECTION, PREPARATION AND INSERTION NOTES**

- A. 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.
- B. 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 the tibial tuberosity is not palpable, insert two finger-breadths below the patella in the flat aspect of the medial tibia.
- C. For adults, proximal or distal tibial sites are preferred. If unavailable, the humeral site may be utilized as a site of last resort by providers who choose to approve their paramedic personnel to access this optional site:
  - 1. The proximal tibial site is one finger-breadth medial to the tibial tuberosity.
  - 2. The distal tibial site is two finger-breadths above the medial malleolus (inner aspect of ankle) in the midline of the shaft of the tibia.
  - 3. Humeral insertion site is considered a site of last resort and may only be utilized by paramedic personnel who are adequately trained and approved by their provider to access this site (Intraosseous Infusion – Optional Humeral Site, Reference No. 1101-A)
  - 4. Prep the surface with a recognized antiseptic agent and wipe dry with a sterile gauze pad.
  - 5. Insert the device according to manufacture specific directions
  - 6. Syringe flush catheter with 10 ml of normal saline. Remember, No Flush = No Flow. If the patient responds to painful stimuli, SLOWLY (over 1 to 2 minutes) administer 0.5 mg/kg of 2% Lidocaine (not to exceed 50 mg) prior to saline flush. Consider additional bolus of saline if flow rates slower than expected.
  - 7. Utilize a blood pressure cuff or pressure bag to help infuse fluids.

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8. Dress site, secure tubing.

**OPTIONAL SECONDARY HUMERAL INSERTION SITE:**

- A. Providers may choose whether or not to allow their personnel to utilize the humerus as a secondary insertion site for patients who meet criteria for IO insertion and for whom utilization of the primary tibia insertion site is contraindicated.

- B. Humeral insertion site selection:

Expose the shoulder and place the patient's arm against the patient's body, resting the elbow on the stretcher or ground and the forearm resting on the abdomen. Note the humeral head on the anterior-superior aspect of the upper arm, or the anterior-lateral shoulder. Palpate and identify the mid-shaft humerus and continue palpating toward the proximal end (humeral head). Near the shoulder feel for the small protrusion, this is the base of the greater tubercle and the insertion site. With the opposite hand, pinch the anterior and inferior aspects of the humeral head, while confirming the identification of the greater tubercle. This will help ensure that you have located the midline of the humerus.

- C. Providers choosing to utilize this optional insertion site will ensure that all of their paramedic personnel are adequately trained and approved to access this site.

**PRECAUTIONS AND POSSIBLE COMPLICATIONS:**

- A. Chest compressions (if indicated), airway and breathing should be established first in accordance with other protocols.
- B. No more than one attempt in each tibia or humerus.
- C. Local infiltration of fluids / drugs into the subcutaneous tissue due to improper needle placement.
- D. Cessation of the infusion due to clotting in the needle, or the bevel of the needle being lodged against the posterior cortex.
- E. Osteomyelitis or sepsis.
- F. Fluid overload.
- G. Fat or bone emboli.
- H. Fracture.

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**S-SV EMS APPROVED IO DEVICES:**

The following IO devices have been approved for use in the S-SV EMS Region:

- A. Bone Injection Gun (B.I.G.)®
- B. EZ-IO®
- C. Manual pediatric IO device – bone marrow type needles, 15 and 18 gauge size