



COUNTY OF VENTURA HEALTH CARE AGENCY		EMERGENCY MEDICAL SERVICES POLICIES AND PROCEDURES	
Policy Title: Intraosseous Infusion		Policy Number: 717	
APPROVED: Administration:  Steven L. Carroll, Paramedic		Date: December 1, 2024	
APPROVED: Medical Director:  Daniel Shepherd, MD		Date: December 1, 2024	
Origination Date: September 10, 1992 Date Revised: October 10, 2024 Date Last Reviewed: October 10, 2024 Review Date: October 31, 2026		Effective Date: December 1, 2024	

- I. PURPOSE: To define the indications, procedure, and documentation for intraosseous insertion (IO) and infusion by paramedics.
- II. AUTHORITY: Health and Safety Code, Sections 1797.178, 1797.214, 1797.220, 1798 and California Code of Regulations, Title 22, Sections 100091.01 and 100096.02.
- III. POLICY: IO access may be performed by paramedics who have successfully completed a training program approved by the EMS Medical Director
  - A. Training
    1. The EMS service provider will ensure their paramedics successfully complete an approved training program and will notify EMS when that is completed.
  - B. Indications
    1. Patients with an altered level of consciousness (ALOC) or in extremis AND there is an urgent need to administer intravenous fluids or medications AND venous access is not readily available.
  - C. Contraindications
    1. Recent fracture (within 6 weeks) of selected bone.
    2. Congenital deformities of selected bone.
    3. Grossly contaminated skin, skin injury, or infection at the insertion site.
    4. Excessive adipose tissue at the insertion site with the absence of anatomical landmarks.
    5. IO in same bone within previous 48 hours.  
History of significant orthopedic procedures at insertion site (ex. prosthetic limb or joint).

#### IV. PROCEDURE:

- A. For responsive patients, infuse 2% cardiac lidocaine prior to fluid/medication administration for pain management, slow IVP over 60 seconds.
  1. 3-39 kg: 0.5 mg/kg
  2.  $\geq 40$  kg: 40 mg
  3. Adjust for EZ-IO connector tubing
- B. EZ-IO insertion
  1. Assemble the needed equipment
    - a. Choose the appropriate size IO needle
      - 1) 15 mm needle sets (pink): 3-39 kg
      - 2) 25 mm needle sets (blue):  $\geq 40$  kg (minimum size for distal femur insertion on pediatric patients)
      - 3) 45 mm needle sets (yellow): Humeral head for Adults or patients with excessive adipose tissue at insertion site.
    - b. Alcohol wipes
    - c. Sterile gauze pads
    - d. 10 mL syringe
    - e. Primed EZ Connect tubing
      - 1) If unresponsive use normal saline
      - 2) If responsive use cardiac lidocaine.
    - f. Tape or stabilization device
  2. Identify appropriate insertion site
    - a. **Proximal Tibia**
      - 1) Pediatric: 2 cm below the patella, 1 cm medial
      - 2) Adult: 2 cm medial to the tibial tuberosity
      - 3) Needle should be positioned at a 90-degree angle to the insertion site.
    - b. **Distal Femur** (approved only for pediatrics)
      - 1) Keep leg out-stretched to ensure the knee does not bend.
      - 2) Palpate the patella, insertion site approximately 1-2 cm proximal to the superior border of the patella, just medial to midline.
      - 3) Needle should be positioned at a 90-degree angle to the insertion site.

c. **Humeral Head** (approved only for  $\geq 18$  years)

- 1) Rotate arm so that patient's thumb is posterior or place arm over the abdomen and bent 90 degrees at the elbow.
  - 2) Locate the most prominent portion of the greater tubercle, 1-2cm above the surgical neck.
  - 3) Needle should be positioned at a 45-degree angle to the insertion site.
3. Prepare the site utilizing aseptic technique with alcohol wipe.
  4. Insert per manufacturer recommendations.
  5. Attach primed EZ Connect tubing and attempt to aspirate bone marrow.
  6. For responsive patient infuse lidocaine.
  7. Flush with 10 mL NS to assess patency.
  8. Infuse NS and/or medications as indicated.
  9. Secure the IO needle with tape or stabilization device.
  10. Monitor for complications.
  11. Manual insertion of the EZ-IO needle can be attempted in the event of driver failure

C. Fluid Administration

1. Active pushing of fluids may be more successful than gravity infusion. Use of pressure to assist with fluid administration is recommended, and usually necessary to achieve adequate flow.
2. Fluid administration on smaller patients should be given via syringe boluses to control/monitor amount infused. Close observation of the flow rate and total amount of fluid infused is required.
3. If infiltration occurs or the IO needle is accidentally removed, stop the infusion, leave the connector tubing attached.

D. Documentation

1. The insertion site, needle size, number of attempts, success, complications, and any applicable comments related to attempting an IO infusion shall be documented on the VCePCR.