

# Monterey County EMS System Policy



Policy Number: 4505  
Effective Date: 7/1/2023  
Review Date: 6/30/2026

## INTRASOSEOUS INFUSION

### I. PURPOSE

Intraosseous infusion is to provide an alternate means of vascular access when speed in vascular access is critical, the IV route is not available, or IV access attempts were unsuccessful and the patient would benefit from the timely administration of drugs or fluids.

### II. POLICY

A. Intraosseous infusion may be performed by paramedics who have successfully completed Monterey County EMS Agency approved training within the previous 12 months. Documentation of this training shall be maintained by the paramedic's employer and provided to the Monterey County EMS Agency.

B. Intraosseous infusion is approved for adult and pediatric patients.

C. Approved sites for IO insertion:

1. Adult (9 years of age or older, or 40 kg or greater)
  - a. Proximal tibia or proximal humerus
2. Pediatric (8 years of age and younger, or less than 40 kg)
  - a. Proximal tibia only

D. Indications:

1. Cardiac arrest or impending cardiac arrest.
2. Decompensated shock when IV access cannot be rapidly achieved.
3. Shock state or patient condition indicates the need for rapid parenteral (routes other than oral or rectal) fluid or medication infusion and IV access is not available (e.g.: significant burns) or multiple IV attempts have failed.

E. Contraindications:

1. Recent fracture of the involved bone.
2. Infection at the site selected for insertion.
3. Inability to locate anatomical landmarks for insertion.
4. Those patients who have a patent IV or in whom an IV may be established in a timely manner.
5. Second attempt on the same bone.
6. Patients who are medically stable and whose condition does not require rapid parenteral fluid or medication administration.

### III. PROCEDURE

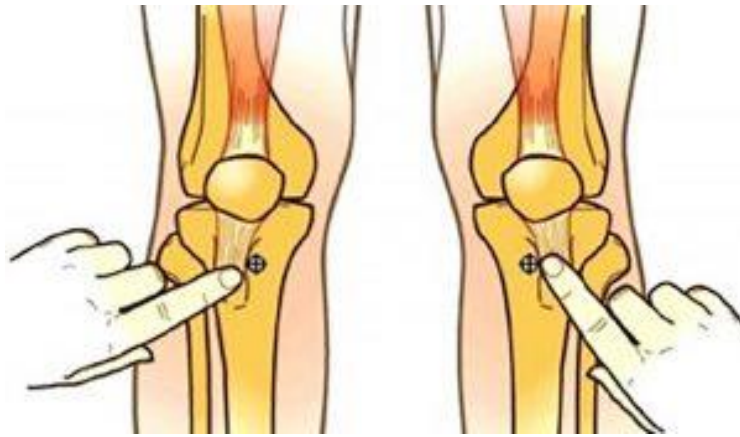
- A. Assure that indications for use have been met.
  1. Determine patient age and weight to select the appropriate IO insertion device.
    - a. For a patient who weighs 3 kg or less, use a manual IO device.
    - b. For a patient who weighs more than 3 kg but is either less than 40 kg or less than 8 years of age, use the Pediatric EZ-IO or manual device.
    - c. For a patient who weighs 40 kg or greater or is 8 years of age or older, use the Adult EZ-IO.
  2. Locate approved insertion site
    - a. Adult (8 years of age or older, or 40 kg or greater)
      - i. Proximal tibia or proximal humerus (see Figures 1 and 2)
    - b. Pediatric (less than 8 years of age, or less than 40 kg)
      - i. Proximal tibia only (see Figure 1)
- B. Process for insertion.
  1. Use appropriate personal protective equipment (gloves, mask, eye protection).
  2. Obtain age/weight appropriate supplies.
  3. Rule out contraindications.
  4. Locate appropriate insertion site.
  5. Prepare insertion site using aseptic technique.
  6. Prepare the intraosseous device.
  7. Stabilize the site and insert the needle at a 90-degree angle to the bone (**see Figure 1**). For proximal humerus insertion (adults only), insert the needle at a 45-degree downward angle to the lateral plane of the shoulder (**see Figure 2**).
  8. Remove the stylet from the catheter.
  9. Confirm placement of the catheter by flushing the catheter with 10 cc normal saline.
  10. Consider the administration of Lidocaine (2% solution) 20 mg IO for the adult or 0.5 mg/kg (up to 20 mg) IO for the pediatric patient who is conscious and complains of pain at the insertion site.
  11. Attach IV tubing to the IO device.
  12. Flush catheter with 10 cc normal saline. Check for signs of extravasation (soft tissue swelling or difficulty infusing fluids through the catheter). Begin normal saline infusion or medication administration. Consider use of pressure device to provide rapid infusion of fluids, if needed.
  13. Dress insertion site, stabilize and secure the catheter.

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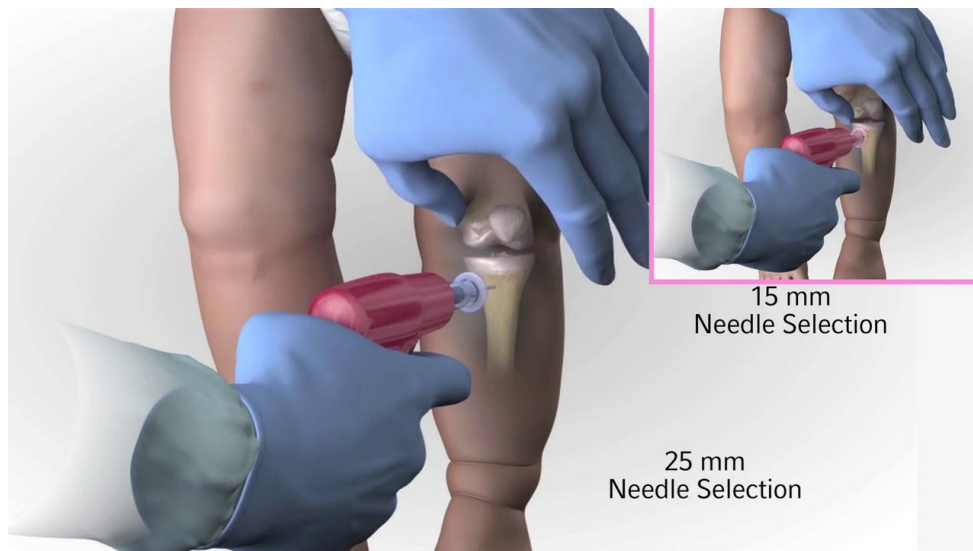
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14. Closely monitor insertion site for signs of extravasation. If there is progressive soft tissue swelling at the insertion site, or if there is significant resistance to infusion of fluids or administration of medication through the IO catheter, leave the IO catheter in place but discontinue use of the IO device.
15. Advise hospital staff of any difficulty administering fluids or medication through the IO catheter, any signs of extravasation, or any other complications associated with IO placement.

**Figure 1: Proximal Tibia Insertion Site (Adult and Pediatric Patients)**

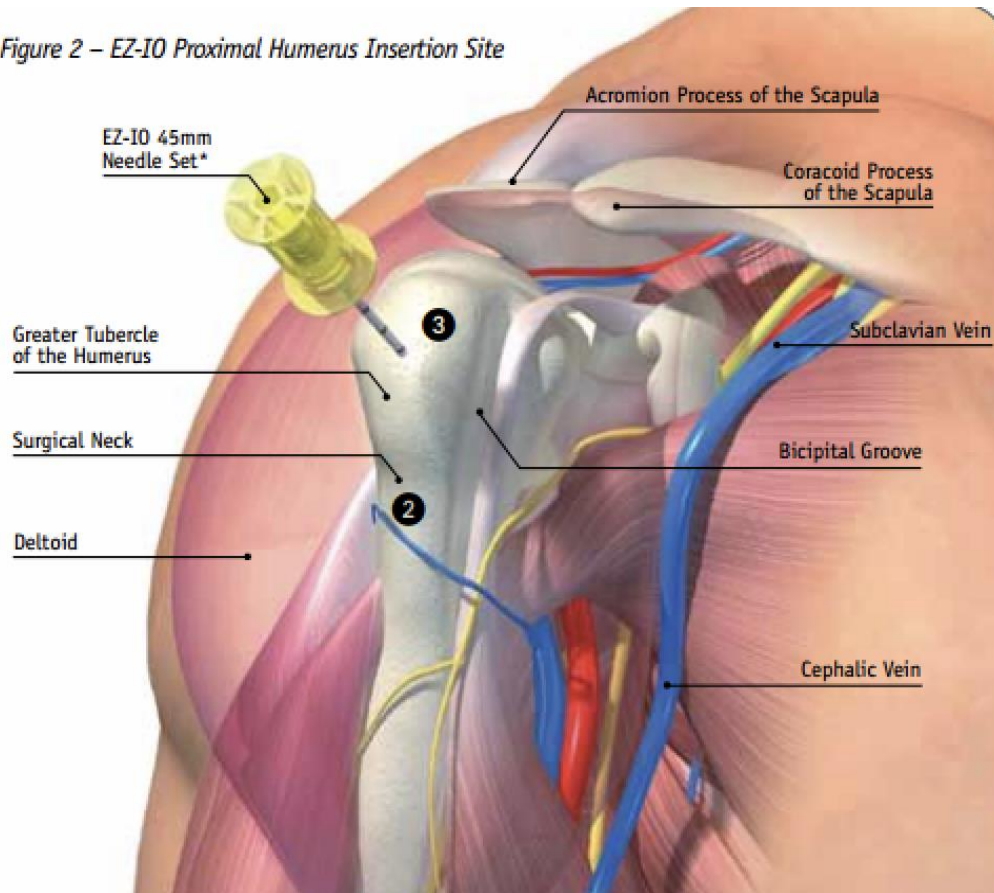


(Insert needle at a 90-degree angle to the plane of the bone.)

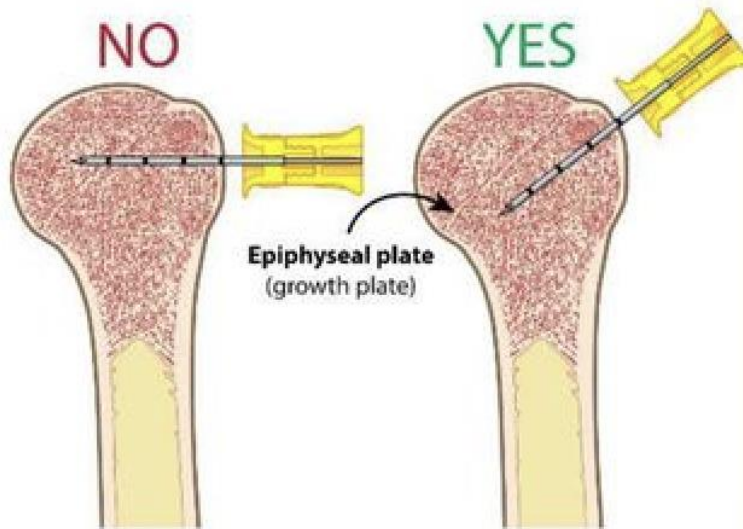


**Figure 2: Proximal Humerus Insertion Site (Adult Patients Only)**

Figure 2 – EZ-IO Proximal Humerus Insertion Site




(To avoid the epiphyseal growth plate, insert the needle at a 45-degree downward angle to the lateral plane of the shoulder.)



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**END OF POLICY**

  
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