

Standards Procedure (Skill) Parenteral Access Section

Parenteral Access: Intraosseous

A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Rapid, regular IV access is unavailable with any of the following:
- Cardiac arrest.
- Multisystem trauma with severe hypovolemia.
- Severe dehydration with vascular collapse and/or loss of consciousness.
- Respiratory failure / Respiratory arrest.
- Burns.

Contraindications:

- Fracture proximal to proposed intraosseous site.
- History of Osteogenesis Imperfecta
- Current or prior infection at proposed intraosseous site.
- Previous intraosseous insertion or joint replacement at the selected site.

Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
 - **Proximal tibia:** Identify anterior-medial aspect of the proximal tibia (bony prominence below the knee cap). The insertion location will be 1-2 cm (2 finger widths) below this.
 - **Distal tibia:** If above site is not suitable, and patient is an adult, identify the anterior-medial aspect of the distal tibia (2 cm proximal to the medial malleolus).
 - **Distal femur:** If this site is not suitable, and patient is a pediatric, identify the patella with the leg out-stretched to prevent bending of the knee. The insertion site is approximately 1 cm above the patella and approximately 1 – 2 cm medially.
 - **Proximal humerus:** Acceptable insertion site for adult patients. Locate the insertion site 1 – 2 cm above the surgical neck on the most prominent aspect of the greater tubercle. This is located on the lateral aspect of the ball of the humerus. Direct the needle at a 45 degree angle or toward the opposite hip.
3. Prep the site recommended by the device manufacturer with an antiseptic solution.
4. For manual pediatric devices, hold the intraosseous needle at a 90 degree angle to bone surface, aimed away from the nearby joint and epiphyseal plate, twist the needle handle with a rotating grinding motion applying controlled downward force until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further.
5. For the EZ-IO intraosseous device, hold the intraosseous needle at a 90 degree angle to bone surface, aimed away from the nearby joint and epiphyseal plate, power the driver until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further. Blue (25mm) IO needle is typically recommended for tibial IO placement (adults and children), Yellow (45 mm) IO needle is typically utilized for proximal humerus, and Pink (15 mm) should only be utilized in neonates. IO needle choice may vary based on a patients body habitus, or abnormal weight for age.
6. For the Bone Injection Gun (BIG), find and mark the manufacturers recommended site. Position the device and pull out the safety latch. Trigger the BIG at 90° to the bone surface and remove the injection device.

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7. Remove the stylette and place in an approved sharps container.
8. Attach a syringe filled with at least 5 ml NS; For IO manual devices only, verify placement by aspirating bone marrow. Inject at least 5 ml of NS to clear the lumen of the needle. Look for infiltrations around site.
9. Attach the IV line and adjust flow rate. A pressure bag may assist with achieving desired flows.
10. Stabilize and secure the needle with dressings and tape.
11. Paramedics and AEMT may administer 20 to 50 mg (1 to 2.5 ml) of 2% Lidocaine in adult patients who experience infusion-related pain. This may be repeated prn to a maximum of 60 mg (3 ml).
For infant/child dose is 0.5mg/kg, Not to exceed 40mg.
12. Following the administration of any IO medications, flush the IO line with 10 ml of IV fluid.
13. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.