

**Clinical Indications:**

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

**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.).
2. Select the appropriate IO device: EZ-IO 3-39 kg, 40 kg and greater needle size or the manual IO needle.
3. Locate insertion site for EZ-IO device:
  - (a) Primary insertion site is the proximal tibia, 1-2 cm (2 finger widths) below the tibial tuberosity (bony prominence below knee cap) and medially.
  - (b) Secondary insertion site is the anteriomedial aspect of the distal tibia (2 cm proximal to the medial malleolus).
  - (c) An acceptable alternative site is the prominence of the anterior humeral head. Place the supine patient's elbow on the floor or stretcher and place the palm of the same extremity over the umbilicus. Palpate the middle of the humeral shaft, moving toward the head, locating the greater tubercle. Pinch the anterior and inferior humerus with the other hand ensuring that you have located the midline of the tubercle. Palpate for the most prominent area. Check arm adduction to avoid insertion site nerve injury.
4. Manual pediatric device:
  - (a) This shall be used as an alternative device to the EZ-IO Drill for patients less than 8 years old.
  - (b) Primary insertion site is the proximal tibia (bony prominence below knee cap). This insertion site is 1-2 cm (2 finger widths) below and medially.
  - (c) Secondary insertion site is the distal femur, midline 2-3 cm above the external condyles.
5. Prep the site with providone-iodine ointment or solution.
6. For the manual pediatric device proximal tibia site, hold the intraosseous needle at a 60 degree to 90 degree angle, aimed away from the knee joint and growth plate, twist the handle with a rotating grinding motion applying controlled downward force until a "pop" or "give" is felt or resistance is lost. Advance the needle no further.
7. For the EZ-IO device, hold the IO needle at a 60 degree to 90 degree angle, aimed away from the knee joint and any growth plate, power the driver until a "pop" or "give" is felt/resistance is lost. Advance needle no further.
8. Remove the stylette and place in an approved sharps container.
9. Attach a syringe filled with at least 5 cc NS; aspirate bone marrow for manual devices only, to verify placement; then inject 10 cc of NS to clear the lumen of the needle.
10. Attach the IV line and adjust flow rate. A pressure infuser device may assist with achieving desired flows.
11. Stabilize and secure the needle with dressings and tape.
12. You may administer 20 to 40 mg (2 to 4 cc) of 2% Lidocaine in adult patients and 0.5 mg/kg in pediatric patients who experience infusion-related pain. This may be repeated as needed to a maximum of 60 mg (6 cc).
13. Following the administration of any IO medications, flush the IO line with 10 cc of IV fluid.
14. Document the procedure, time, and result (success) on/with the patient care report (PCR).

**Certification Requirements:**

- EMT-P
- Successful completion of training module and skill evaluation.