

INTRAOSSEOUS PLACEMENT

Intraosseous placement is intended **only** for those patients needing immediate vascular access in those that peripheral access cannot be established. In rare cases, it may be considered **prior** to peripheral attempts, but only as outlined below. This procedure may only be used by personnel specifically trained and signed off by their agency's Squad Medical Director.

A. Indications:

1. Immediate vascular access in life-threatening emergencies.

Note: IO insertion shall NOT be performed just for prophylactic access.

2. Intravenous fluids or medications are urgently needed and peripheral intravenous access cannot be established in a timely manner AND the patient exhibits one or more of the following:
 - a. Altered mental status (GCS \leq 8).
 - b. Respiratory compromise (pulse oximeter \leq 90% after appropriate O₂ therapy, or respiratory rate < 10 or > 40).
 - c. Hemodynamic instability (systolic BP < 90).
3. Intraosseous may be considered **prior** to peripheral IV attempts where successful rapid peripheral IV placement is doubtful, as in the following situations:
 - a. Cardiac arrest (medical or trauma).
 - b. Profound hypovolemia with altered mental status.
 - c. Patient in extremis with immediate need for medication or intravenous fluids (patient in status epilepticus, impending arrest, etc.).

B. Contraindications:

1. Fracture of the bone selected for IO infusion (*consider alternate side*).
2. Absence of anatomic landmarks at selected site.
3. Previous significant orthopedic procedure (prosthesis, recent surgery).
4. Infection at the selected site.

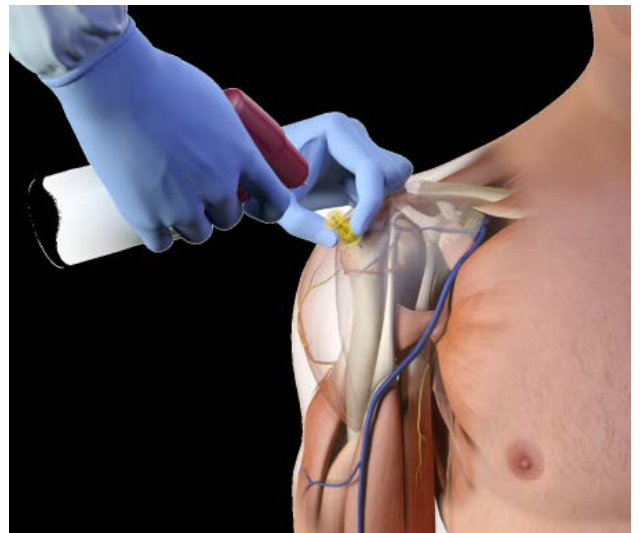
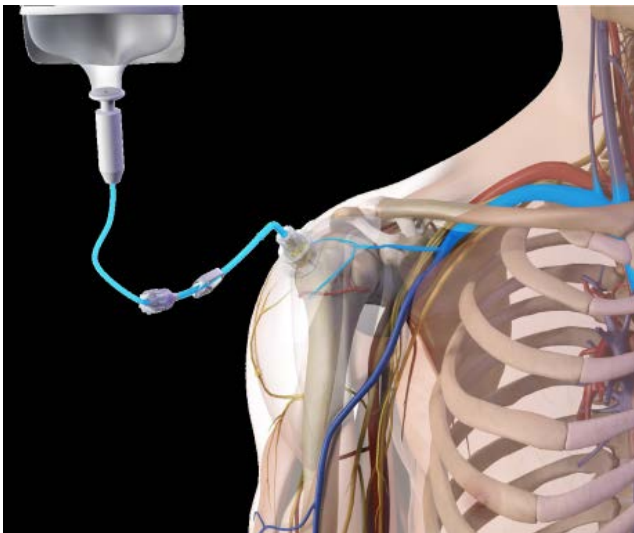
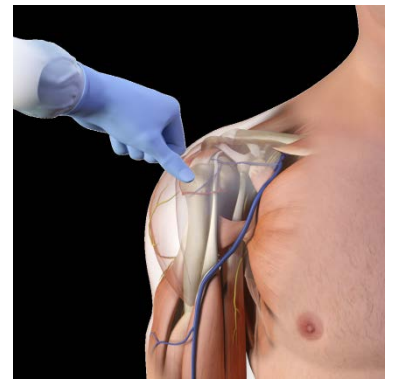
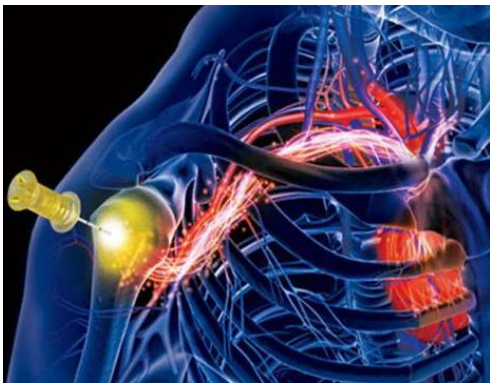
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C. Procedure:

1. **ADULT:** Select insertion site in the following order, unless contraindicated: proximal humerus, proximal tibia, then distal tibia.
2. **PEDIATRIC:** Select insertion site in the following order, unless contraindicated: proximal tibia, distal tibia, then proximal humerus.

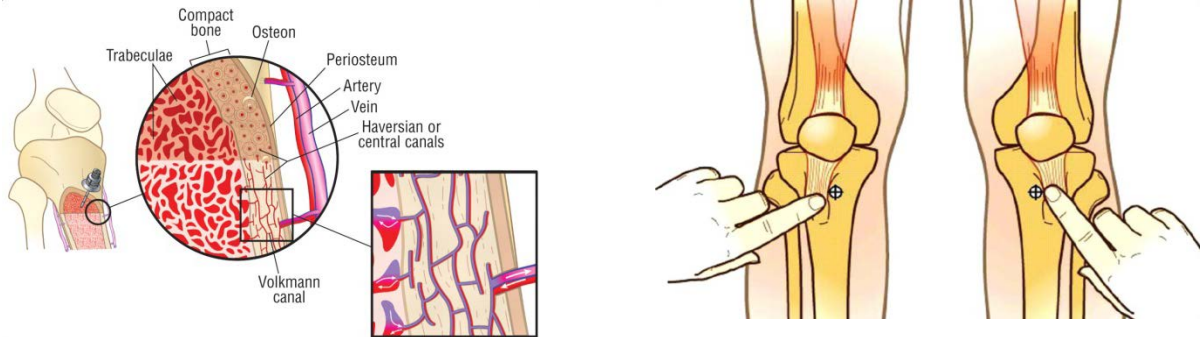
Note: Red arrows point to targeted insertion sites.

- a. Adult and Pediatric proximal humerus: greater tubercle just anterior to midline.

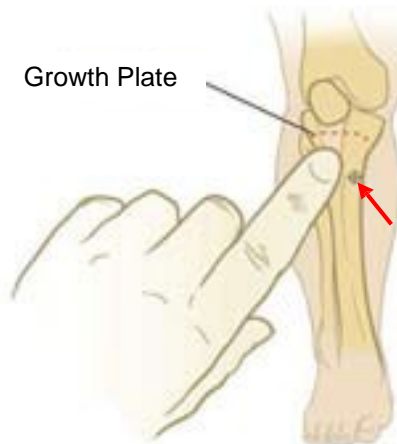


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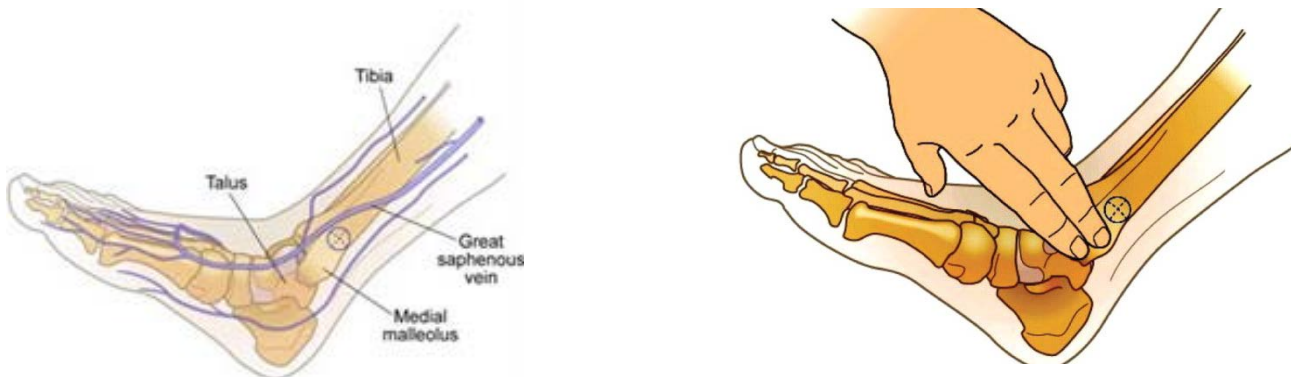
- b. Adult proximal tibia: Measure one (1) fingerbreadth *medial* to the tibial tuberosity, along the flat aspect of the medial tibia as shown below.



- c. Pediatric proximal tibia: one (1) finger width distal to tibial tuberosity OR if unable to palpate tibial tuberosity, two finger widths below the patella along the flat aspect of the medial tibia. Avoid growth plates.

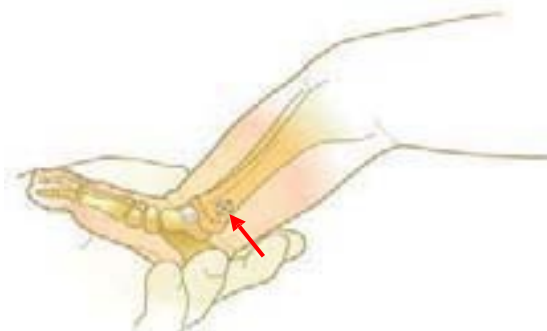


- d. Adult distal tibia: two (2) finger widths proximal to the medial malleolus and midline on the medial shaft.



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- e. Pediatric distal tibia: one (1) finger width proximal to the medial malleolus along the flat aspect of the medial distal tibia.



3. Prepare the skin site with antiseptic.
4. Prepare IO drill and needle set, then load the appropriate sized needle onto the driver.
5. Hold the IO drill in one hand and stabilize the extremity near the insertion site with the opposite hand.
6. Position the drill at the insertion site with the needle at a 90 degree angle to the surface of the bone. Insert IO. Stabilize needle.
7. Analgesia. In the conscious/awake patient, slowly administer lidocaine 2% (**cardiac lidocaine 100mg/5ml [20mg/ml] - preservative free**) through the IO hub as follows. *Ensure that the patient has no allergy to lidocaine.*
 - a. Adults: Lidocaine 40 mg (2 ml) **slow** IO.
 - b. Pediatric: Lidocaine 0.5 mg/kg **slow** IO.

Allow the lidocaine to work from 30 – 60 seconds before giving the flush.

8. Flush: To ensure proper infusion, administer a **rapid syringe bolus flush** as follows and repeat if necessary:
 - a. Adults and Pediatric: 10 ml normal saline rapid IO bolus.
 - b. Include any pediatric flushes into totals for IV fluids given and record the amounts.

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8. If no soft tissue infiltration is seen, attach IV line and infuse fluids and /or medications as usual; for adults, the IV bag will need to be under pressure. If the flow through the intraosseous line decreases after initial success, consider repeating the flush.
9. Monitor the area for signs of soft tissue infiltration and stop all infusions if infiltration is suspected.
10. Notify the receiving facility of the presence of the IO device prior to moving to the hospital stretcher.

** Permission to use the anatomic photos in this protocol was provided by Vidacare Corporation.*