



EDUCATIONAL MATERIAL Intraosseous (IO) Insertion

Objectives:

Following completion of this training, providers will be able to:

- Recognize the indications and contraindications for intraosseous insertion in the prehospital setting
- Demonstrate proper insertion of an intraosseous needle into the following sites:
 - Proximal tibia
 - Humeral head

Resources:

- IO needles
- IO insertion device (optional)
- Commercial training bones (or other acceptable material)

Didactic Topics:

Section #1: Indications:

1. Any patient in extremis/cardiac arrest when an IV attempt has been unsuccessful

Section #2: Contraindications:

ABSOLUTE

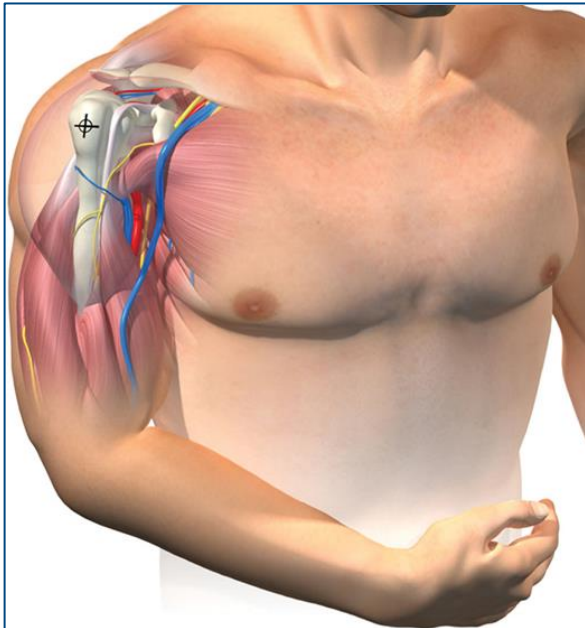
1. Suspected or known fractures of the extremity targeted for placement.
2. Sites below the waist when there has been vascular disruption of the extremity or pelvis.

RELATIVE

1. Infection, burn or cellulitis overlying the site.
2. Congenital deformities of the bone.
3. Metabolic bone disease.
4. Previous IO insertion attempt at site

Section #3: Instructions for Insertion:

1. Aseptic technique must be followed at all times.
2. Position appropriately and stabilize extremity.
3. Identify infusion site
 - Proximal humerus
 - Slide thumb up the anterior shaft of the humerus until you feel the greater tubercle, this is the surgical neck
 - ~ 1 cm above the surgical neck is the insertion site
 - The patient's hand should rest palm down on the their abdomen with the elbow adducted
 - In small children the greater tubercle is poorly developed and may be impalpable
 - Proximal tibia
 - 2 finger breadths below the patella and 1-2cm medial to the tibial tuberosity in adults



4. Clean site
5. Insert IO Needle
 - a. Insert the needle through skin at a 90 degree angle to the surface your are inserting the needle into
 - b. Penetrate to periosteal surface (bone contact)
 - c. Rotate and apply firm pressure on needle or engage device
 - d. Stop when "pop" felt
 - e. Remove obturator



6. Confirm Placement
 - a. Attach syringe to needle or extension set
 - b. Aspirate to confirm position - if no aspirate, continue to next step
 - c. Flush rapidly with 20 mL saline

NOTE: IN the conscious patient, consider prefilling IV extension set, or slow IO push of Lidocaine 2% (up to 30mg) for patient comfort prior to the introduction of saline.

- If needle flushes without resistance, proceed
 - If resistance is met, remove needle, apply pressure, and attempt alternate access
- d. Disconnect syringe
7. Attach IV tubing
 8. Stabilize needle with commercial device or gauze pads and tape to immobilize
 9. Fluid administration may require hand or pressure pump
 10. Any intravenous medications may also be administered intraosseously

Recommended Skills Demonstration:

- Verbalize indications and contraindications for prehospital intraosseous insertion
- Demonstrate the correct placement of an intraosseous needle at the following sites:
 - Humeral head
 - Proximal tibia