

## 7.12 ADULT AND PEDIATRIC VASCULAR ACCESS WITH INTRAOSSEOUS (IO) DEVICE

### INDICATION

- Critically ill or injured patients
  - Unable to obtain pulse;
  - Unresponsive;
  - Apneic;
  - Hypotension with shock;
  - Acute deteriorating level of consciousness.
- If vascular access cannot be established via peripheral IV in 2 attempts or less than 90 seconds, then proceed with either IO or PVAD access.
- Less invasive route of medication administration (PO, IN, IM) is preferred for stable patients prior to the attempting an IO insertion.

### PROCEDURE

1. Assemble needed equipment.
2. Non-traumatized proximal tibia is the preferred insertion site. Locate the landmarks 2-3 cm below the tibial tuberosity on the anteromedial flat bony surface of the proximal tibia and prepare the site.
3. If there is significant trauma or fractures bilaterally in the lower extremities then the humeral head may be used for intraosseous insertion.
  - a. Place the patient's hand over their umbilicus on the side chosen for insertion in order to perform a medial rotation of the humerus and elbow.
  - b. Place the IO about 1 cm above the surgical neck of the humerus.
  - c. Secure extremity in swath bandage.
4. Insert the IO needle holding the leg (or arm) steady:
  - a. Grasp the needle with the obturator still in place and insert it through the skin at the selected site at a 90-degree angle to the skin surface.
5. When the needle is felt to 'pop' into the bone marrow space:
  - a. Remove the obturator.
  - b. Attach a syringe with 0.5 mg/kg of 2% **Lidocaine** solution (max dose 50 mg) and flush the IO needle in patients who are conscious.
  - c. Attach a <10 ml syringe containing IV solution, to flush the IO needle 30 to 60 seconds following lidocaine administration.

**OR**

  - d. Remove the obturator; attach a primed IV solution set with or without a stopcock.
  - e. Draw 5 ml of fluid from the IV bag then pinch or close the stopcock and flush IO needle.
6. If unable to flush, continue procedure and watch carefully for extravasation and swelling while infusing fluids and/or medications.
7. Secure the needle by taping and splint the leg as indicated to maintain stability.
8. If infiltration occurs or needle removed, stop the infusion, remove the needle, and apply a pressure bandage to the IO site. If another IO will be attempted, use a different bone.

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### NOTES

- Active pushing of fluids may be more successful than gravity infusion. Use the same size syringe for fluid boluses.
- An insertion device pre-approved by the EMS Agency Medical Director may be utilized according to manufacturer instructions substituting for steps 2 through 4 above.