7.12 Adult and Pediatric Vascular Access with Intraosseous (IO) Device

INDICATION

- Critically ill or injured patients
    - Cardiac arrest or impending arrest
    - Severe Hypotension with profound shock and poor perfusion;
    - Acute deteriorating level of consciousness.

If vascular access cannot be established via peripheral IV in 2 attempts or less than 90 seconds (in scenarios listed above), then proceed with either IO or see protocol- **7.13 Vascular Access with Pre-Existing Vascular Access Device**

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CONTRAINDICATION

- Fracture to bone and/or splint distal to insertion site;
- Prior orthopedic procedure (total knee or shoulder replacement) or amputation;
- Previous IO attempt in same extremity;
- Pre-existing condition affecting extremity such as burns or infections;
- Patient is not critically ill or injured

PROCEDURE

1. Choose either site:

    a. Humeral Head
        i. Place patient's hand over umbilicus on chosen side
        ii. Place IO about 1 cm above the neck of humerus and at a 45-degree angle to the anterior plane and posteromedial

    OR

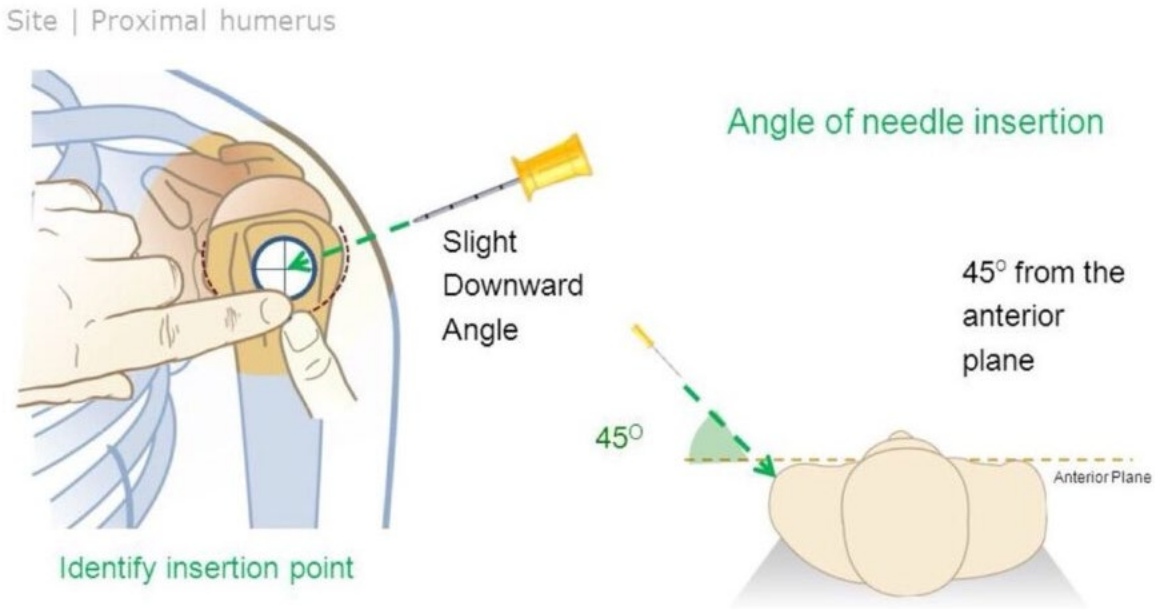
    b. Proximal Tibia
        i. Landmark 2-3 cm below tibial tuberosity on anteromedial flat bony surface at a 90-degree angle

2. Assemble needed equipment
3. Prep site with approved aseptic technique
4. Insert the IO needle:
    a. Humeral Head
        1. Hold the arm steady.
        2. Place the IO about 1 cm above the surgical neck of the humerus
        3. Grasp the needle with the obturator still in place and gently press needle through the skin until the tip touches the bone. The 5 mm black mark must be visible above the skin prior to insertion. Squeeze the trigger and apply gentle steady

pressure insert it through the skin at the selected site at a 45-degree angle to the skin surface.

b. Proximal Tibia
    1. Hold the leg steady.
    2. Grasp the needle with the obturator will in place and insert it through the skin at the selected site at a 90-degree angle to the skin surface.

5. When a needle is felt to 'pop' or have lack of resistance into the bone marrow space:
    a. Remove the obturator.
    b. Attach a syringe with 0.5mg/kg of 2% Lidocaine solution (max dose 50 mg) and slowly flush the IO needle in patients who are conscious.
    c. Attach a <10 mL syringe containing IV solution, to flush the IO needle 120 seconds following lidocaine administration.
    d. Remove the obturator; attach a primed IV solution set with or without a stop cock.
6. If unable to flush, continue procedure and watch carefully for extravasation and swelling while infusing fluids and/or medications
7. Secure the needle, catheter hub to skin, and immobilize extremity
8. If infiltration occurs or needle is 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.
    a. Remove IO by attaching syringe to needle hub and firmly pulling straight out from site



Additional Guidance

- 45mm needle recommended for adults
- Advance 1 to 2cm after 'pop' or lack of resistance
- Use stabilizer
- Immobilize extremity