Section: ALS Protocols 
Subject: INTRAOSSEOUS INFUSIONS
Section #: 345.11
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1. Intraosseous (IO) access shall only be performed by individuals thoroughly trained in the technique.
    a. Approved site locations:
        i. Tibial Tuberosity (Adults and Pediatrics)
        ii. Humeral Head (Adults only)
    b. Approved needle sizes
        i. Yellow – Humeral Head or Tibial Tuberosity (with presence of excessive tissue at site)
        ii. Blue – Tibial Tuberosity
        iii. Pink – Tibial Tuberosity (ages <1 month)

2. Two (2) peripheral IV attempts must be made and documented prior to obtaining intraosseous access.

3. All drugs and solutions authorized for IV administration may be given by the intraosseous route.

4. INDICATIONS:
    a. Critical or unstable patients
        i. Intravenous fluids or medications needed and a peripheral IV cannot be established in two (2) attempts.

5. CONTRAINDICATIONS
    a. Fracture of the tibia or femur (consider the contralateral side).
    b. Previous orthopedic procedures, e.g. intraosseous within last 24 hours, knee replacement (consider the contralateral side).
    c. Pre-existing medical condition (tumor near site or peripheral vascular disease).
    d. Infection at the insertion site (consider the contralateral side).
    e. Inability to locate landmarks (significant edema).
    f. Excessive tissue at the insertion site.
        i. At least one black depth marker must be visible outside of skin before driver activation
        ii. If excessive tissue is present at insertion site, consider using the next larger needle size

6. CONSIDERATIONS
    a. Pain:
        i. Insertion of intraosseous device in conscious patients causes mild to moderate discomfort and is usually no more painful than a large bore IV.
        ii. Intraosseous infusions may cause discomfort for conscious patients.
            1. Prior to intraosseous bolus or flush on an alert patient, SLOWLY administer 0.5 mg/kg up to a maximum of 40 mg of 2% lidocaine (preservative free; 20 mg/mL) through the intraosseous hub. May be repeated once at half dose in 15 minutes if necessary to control pain.
    b. Flow rates:
        i. Due to the anatomy of the intraosseous space, the flow rates will be slower than those achieved with IV access.
            1. Ensure the administration of a 10 mL rapid bolus (flush) of NS with a syringe.
            2. Use a pressure bag or pump for continuous infusions.