

Intraosseous Infusion

Intraosseous infusion is an alternative technique in providing a rapid and effective route for fluid resuscitation and medication administration for pediatric and adult patients in an emergency situation when intravenous cannulation is unsuccessful or cannot be obtained in a reasonable period of time.

INDICATIONS

Burns (extensive)
Cardiac Arrest
Coma (unconscious/unresponsive)
IV access is unobtainable by other means
Medication administration which cannot be administered by other routes (i.e. IV, ET, IM, SC)
Multi-systems Trauma
Shock and/or severe dehydration
Status Epilepticus

CONTRAINDICATIONS

Injury to Tibia(s)
Recent fracture to tibia(s)
Osteogenesis Imperfecta (congenital disease-fragile bones)
Osteoporosis
Infection of extremity (of the intended puncture site)
Burns of the extremity

EQUIPMENT

INTRAOSSIOUS infusion needle (16, 18 or 20 ga)
5 or 10 cc syringe
Micro set IV tubing and IV solution (NS)
Betadine Swab and tape

POTENTIAL COMPLICATIONS

Delay in transportation
Osteomyelitis, subperiosteal infusion, and infection
Subcutaneous abscess, epiphyseal trauma, fat embolus
Thrombosis
Tibial fracture

Intraosseous Infusion (con't)

ASSESSMENT PRIORITIES (if not already done or in progress)

1. Maintain patent ABCs. Assist ventilations as needed. (Assume spinal injury based upon mechanism of injury)
2. Administer high concentration of oxygen by mask or bag-valve-mask (BVM).
3. Ascertain appropriate history related to the event, past medical history, medications, drug allergies and physician.

PROCEDURE

1. Perform enroute to hospital (if possible)
2. Place the patient in a supine position.
3. Locate an appropriate site for intraosseous infusion.
 - a. for children the proximal tibia is an appropriate site.
 - b. When using the anterior medial surface of the proximal tibia, the tibial tuberosity is palpated with the index finger and the medial aspect of the tibia is grasped with the thumb. Half way between these two points or approximately 1-2 cm distally is the optimal point for needle insertion.
 - c. If the distal tibia is used the optimal location is the medial surface of the tibia proximal to the medial malleolus.
4. Select the appropriate site and prepare the area using an aseptic technique.
5. Place the intraosseous needle, using a twisting (screwing) motion with the needle perpendicular to the bone and the bevel pointing away from the joint's base. A rotary motion is used with a downward pressure until there is a slight decrease in resistance indicating that the cortex of the bone has been punctured. The needle usually does not need to be advanced further. The distance from the skin through the cortex is rarely more than 1 cm in an infant or a child and penetration to this depth is usually adequate. At this point remove the stylette. To confirm the position of the needle in the marrow cavity, a syringe is attached and blood or marrow is aspirated. Once the bone marrow needle is confirmed to be in the marrow, a standard IV tubing can be attached to administer fluids and/or medications.
6. Observe for extravasation of fluids into surrounding soft tissue.
7. The patient should be transported as soon as possible, if not already enroute to the hospital.