

**Authority**

Health and Safety Code Division 2.5, California Code of Regulations, Title 22, Division 9

**Purpose**

To obtain rapid circulatory access to provide necessary intravenous fluids or medications for the ALS provider only.

**Approved Devices**

**EZ IO, NIO (New Intraosseous Device) and a manual needle.**

**Approved Sites**

1. Proximal Tibia (anterior medial surface of the tibia, 2 cm below tibial tuberosity)
2. Distal Tibia (lower end of the tibia, 2 cm above medial malleolus)
3. Humeral head (EZ IO only)

**Indications**

1. Approved for use in the adult patient equal to or greater than 12 years old and/or greater than 40 kg. (If less than 40 kg, see Protocol #[04-0817 Pediatric Intraosseous](#)).
2. Consider for use in any cardiac arrest, unconscious and/or critically ill or injured patient in whom IV access cannot be established in a timely fashion.
3. For cardiac arrest consider use as a primary resuscitation device for fluids and/or medications.
4. Any medications or fluids that can be given in a peripheral or central vein can be given intraosseous.

**Contraindications**

1. Inability to locate landmarks.
2. Fracture or recent surgery in the selected site.
3. Infection over the insertion site.
4. Congenital deformity or history of osteogenesis imperfecta or osteopetrosis.
5. Previous orthopedic procedures near the insertion site. (Prostheses or recent IO within the last 24 hours)

**Possible Complications**

1. Compartment syndrome.
2. Skin or bone infection.
3. Bone fracture.
4. Embolus.
5. Bleeding or hematoma. If this occurs stop infusion and apply pressure with sterile gauze.
6. Local infiltration of IO fluids or medication. If this occurs stop infusion and apply pressure with sterile gauze.

**Pain Management**

1. If the procedure is performed on a conscious patient, immediately following placement of the IO needle, may administer 0.5 mg/kg 2% Lidocaine (not to exceed 50 mg) slowly through the IO site. Try to have the lidocaine warmed to decrease the pain. Wait approximately 30–60 seconds before flushing with normal saline.
2. In the event a patient regains consciousness and complains of severe pain secondary to the IO insertion, temporarily stop infusing the fluids, and administer 0.5 mg/kg 2% Lidocaine (not to exceed 50 mg) slowly through the IO. Wait approximately 30–60 seconds before continuing fluid administration. Caution with solution compatibility issues with Lidocaine.
3. If fluids do not flow freely, flush IO site with an additional 10 ml normal saline. Always use a pressure bag for infusion.