

Tuolumne County Emergency Medical Services Agency
EMS System Policies and Procedures

Policy:	INTRAOSSEOUS INFUSION DRILL DEVICE	#252.24
	Creation Date:	9-01-2008
Medical Director:	<u>On File</u>	Revision Date: 9-01-2013
EMS Coordinator:	<u>On File</u>	Review Date:

I. AUTHORITY

Division 2.5, California Health and Safety Code, Sections 1797.172; 1797.185; 1797.206; 1797.214; 1797.218; 1797.220 and; 1797.221. Title 22, California Code of Regulations, Sections 100144 and 100146.

II. DEFINITIONS

- a. "Agency" means the Tuolumne County Emergency Medical Services Agency.
- b. "Emergency Medical Technician Paramedic" or "EMT-P" or "Paramedic" or "Mobile Intensive Care Paramedic" means a person who is educated and trained in all elements of prehospital advanced life support, who has passed all required tests, and who has been certified and accredited by the Agency Medical Director as an EMT-P.
- c. "Intraosseous Infusion Drill Device" i.e. EZ-IO, means a small battery-powered device and two beveled, hollow drill-tipped needles that were specifically designed to provide safe, controlled vascular access via the intraosseous route to patients of all ages in emergent situations when vascular access is challenging or impossible.

III. PURPOSE

Allow Paramedics to perform Intraosseous Infusion, during resuscitation or transport situations utilizing the Intraosseous Infusion Drill Device.

IV. POLICY

- a. Indications
 1. Unable to obtain peripheral vascular access after two attempts or 90 seconds and the patient has an emergent need for either intravenous fluids and/or medications, or if patient has had multiple attempts prior to air crew arrival. Examples (including, but not limited to...) of emergent need for IV access are:
 - a. Burns
 - b. Cardiac Arrest, or near arrest
 - c. Emergent procedure or therapy,
 - d. Respiratory Compromise
 - e. Hemodynamic instability
 - f. Shock

2. There are no contraindications to placement at the proximal tibia.
3. The Intraosseous Infusion Drill Device needle sets may be utilized on the following patients:
 - a. Intraosseous Infusion Drill Device adult size for any adult patient (>40 kg)
 - b. Intraosseous Infusion Drill Device Pedi size for any Peds patients 3-39 kg.

B. Contraindications:

1. Fracture of the tibia or femur.
2. Recent orthopedic procedures: i.e. knee or IO placement within the past 24-hours.
3. Extremity that is compromised by a pre-existing medical condition. i.e. Tumor or PVD
4. Overlying skin infection/trauma at the insertion site
5. Excessive tissue and/or inability to locate anatomical landmarks for insertion.

C. Precautions:

1. Check skin thickness against needle length prior to insertion.
2. The Intraosseous Infusion Drill Device adult size for any AD/PD needle set is intended for insertion in the proximal tibia only
3. The Intraosseous Infusion Drill Device adult size for any may be left in-place for no more than 24-hours.
4. Do not utilize the Power Driver to withdrawal the needle set from the bone.

D. Equipment:

1. Intraosseous Infusion Drill Device adult size for any driver
2. Intraosseous Infusion Drill Device adult size for any Needle Set
3. IV extension tubing
4. Provo-iodine, or betadine.
5. IV setup (with pressure bag preferred)
6. 10 ml or 20 ml syringe
7. Roller gauze

V. PROCEDURE

A. Locate approved site.

1. Proximal Tibia Only
 - a. Feel the front surface of the leg and locate the patella.
 - b. Locate the tibial tuberosity inferior to the patella.
 - c. Insertion location is 1 finger width below the tibial
 - d. Tuberosity on the tibial plateau.
 - e. In pediatric patients where the tibial tuberosity cannot be
 - f. palpated, the insertion site will be **2 finger widths** below
 - g. The patella on the tibial plateau.

2. Insertion

- a. Cleanse site with appropriate antiseptic agent

- b. Position Intraosseous Infusion Drill Device at a 90 degree angle to the bone.
 - c. Power the Intraosseous Infusion Drill Device through the skin to make contact with the bone.
 - d. Evaluate the needle that the skin is below the 5 mm mark.
 - e. If the skin is above the 5 mm mark, skin thickness will not allow the needle set to anchor properly. Find another site.
 - f. Power the Intraosseous Infusion Drill Device and begin insertion until the flange (base) of the Intraosseous Infusion Drill Device needle set touches the skin OR a sudden lack of resistance is felt, indicating entry into the marrow cavity.
 - g. Remove Driver from needle set, while stabilizing needle set with the other hand.
 - h. Remove the stylet from the catheter.
 - i. Attach the extension set to the hub and a standard luer syringe (10-20 ml)
3. Confirm Placement
 - a. Confirm Placement by checking for at least one of the following
 1. Immediately flush the syringe with a crystalloid such as 0.9% NaCl.
 - i. Adults 10 ml of fluid
 - ii. Peds 5 ml of fluid
 - b. If there is any evidence of extravasation or fluid does not flush, stop and remove the device.
 - c. Assure that the catheter is firmly seated and is standing at a 90 degree Angle
 - d. *Do not wiggle the hub!*
 - e. Note blood at tip of stylet.
 - f. Drugs and fluid flow without difficulty
 - g. Connect to fluid and begin infusion.
 - h. If the site does not flow, consider pressure infusion. You may also reflush the catheter or turn it 180 degrees. Repeat as needed.
 - i. *It is imperative that the needle is flushed prior to administering fluids.*
NO FLUSH = NO FLOW
 - j. Secure Intraosseous Infusion Drill Device with roller gauze to prevent accidental dislodgement.
 - k. Make sure to notify receiving healthcare staff of IO insertion, and the need to remove the catheter within 24 hours, and procedure for removal.
5. ADMINISTRATION OF FLUIDS
 - a. Administration of fluids will be slower than through conventional IV cannula.
 - b. Once placement of the needle set has been confirmed, it may be necessary to repeat syringe flushes to maintain flow.
 - c. To maintain flow rates, it may be necessary to utilize a large syringe, pressure bags, or infusion pump.
6. CONSCIOUS PATIENTS

- a. Fluids under pressure or flushing the catheter can cause severe pain in the conscious patient. Prior to administration of fluids under pressure, the following shall be performed.
 1. After confirming placement, administer 2% Lidocaine (preservative free) **slowly** through the Intraosseous Infusion Drill Device.
 - i. **Adults (use of INTRAOSSEOUS INFUSION DRILL DEVICE AD Needle set)**, 20–40 mg. slow.
 - ii. **Peds (use of INTRAOSSEOUS INFUSION DRILL DEVICE PD needle set)**, 0.5 mg/kg slow
 - iii. Pain relief at the site should last for approx. 1 hour.
 - iv. Consider additional analgesia for pain as needed
7. REMOVAL OF NEEDLE/CATHETER
 - a. Attach a sterile syringe to the hub of the needle/catheter. (The syringe will serve as a larger handle for the catheter hub and is preferred)
 - b. Support the patient's extremity while rotating the catheter clockwise and gently pulling.
 - c. Maintain a 90 degree angle while rotating the catheter to insure proper removal without complications.
 1. Remember - the exterior portion of the catheter is smooth or not threaded.
 - d. Rotating the hub during removal reduces catheter to bone friction and will allow for an easier removal process.
 - e. **Be certain that you DO NOT ROCK the catheter while removing.** Rocking or bending the catheter with a syringe may cause the catheter to separate from the hub!
 - f. If hub-catheter separation occurs use an appropriate hemostat to grasp and gently remove the catheter in the same manner as suggested above (rotating while gently pulling).

References

Roberts and Hedges (2004) *Clinical Procedures in Emergency Medicine 4th Edition*, Saunders, Chapter 26 pp 475-485
Vidacare EZ-IO®, Protocol Development Guidelines and Training Manual.
www.vidacare.com