**EZ-IO® Proximal Tibia Insertion Site Identification – Infant/Child**

Extend the leg. Insertion site is approximately 1cm **medial** to the tibial tuberosity, or just below the patella (approximately 1cm or one finger width) and slightly **medial** (approximately 1cm or one finger width), along the flat aspect of the tibia. Pinch the tibia between your fingers to identify the center of the medial and lateral borders.

**EZ-IO® Proximal Tibia Insertion Technique – Infant/Child**

* Prepare the site by using antiseptic of your choice
* Use a clean, “no touch” technique
* Remove the needle set cap
* Stabilize the extremity
* Aim the needle set at a 90-degree angle to center of the bone
* Push the needle set tip through the skin until the tip rests against the bone
* The 5mm mark must be visible above the skin for confirmation of adequate needle set length
* Gently drill, immediately release the trigger when you feel the “pop” or “give” as the needle set enters the medullary space
  + Avoid recoil – do NOT pull back on the driver when releasing the trigger
* Hold the hub in place and pull the driver straight off
* Continue to hold the hub while twisting the stylet off the hub with counter clockwise rotations
  + The catheter should feel firmly seated in the bone (1st confirmation of placement)
* Place the stylet in a sharps container
* Place the EZ-StabilizerTM dressing over the hub
* Attach a primed EZ-Connect**®** extension set to the hub, firmly secure by twisting clockwise
* Pull the tabs off the EZ-Stabilizer dressing to expose the adhesive, apply to the skin
* Aspirate for blood/bone marrow (2nd confirmation of placement)

**Recommended Anesthetic for Infant/Child Responsive to Pain:**

* Observe recommended cautions/contraindications to using 2% preservative and epinephrine free lidocaine (intravenous lidocaine)
* Confirm lidocaine dose per institutional protocol

Usual initial dose is 0.5mg/kg, not to exceed 40mg

* Prime EZ-Connect extension set with lidocaine

*Note that the priming volume of the EZ-Connect is approximately 1.0mL*

For small doses of lidocaine, consider administering by carefully attaching syringe directly to needle hub (prime EZ-Connect with normal saline)

* Slowly infuse lidocaine over 120 seconds

Allow lidocaine to dwell in IO space 60 seconds

* Flush with 2-5 mL of normal saline
* Slowly administer subsequent lidocaine (half the initial dose) IO over 60 seconds

Repeat PRN

* Consider systemic pain control for patients not responding to IO lidocaine

**Infant/Child Unresponsive to Pain**

* Prime EZ-Connect extension set with normal saline
* Flush the IO catheter with 2-5 mL of normal saline
* Connect fluids if ordered, infusion may need to be pressurized to achieve desired rate
* Assess for any signs of extravasation/complications

Should patient develop signs that indicate responsiveness to pain, refer to section “Recommended anesthetic for infant/child responsive to pain”

**EZ-IO® Removal Technique**

* Remove EZ-Connect and EZ-Stabilizer dressing
* Stabilize catheter hub and attach a Luer lock syringe to the hub
* Maintaining axial alignment, twist clockwise and pull straight out
  + Do not rock the syringe
* Dispose of catheter with syringe attached into sharps container

**Lidocaine dosing recommendations were developed based on the research below. For additional references, research and dosing charts, please visit www.eziocomfort.com**

* Philbeck TE, Miller LJ, Montez D, Puga T. Hurts so good; easing IO pain and pressure. *JEMS* 2010;35(9):58-69\*
* Ong MEH, Chan YH, Oh JJ, Ngo AS-Y. An observational, prospective study comparing tibial and humeral intraosseous access using the EZ-IO. *Am J Emerg Med* 2009;27:8-15\*
* Fowler RL, Pierce A, Nazeer S et al. 1,199 case series: Powered intraosseous insertion provides safe and effective vascular access for emergency patients. *Ann Emerg Med* 2008;52:S152\*
* Paxton JH, Knuth TE, Klausner HA. Proximal humerus intraosseous infusion: a preferred emergency venous access*. J Trauma*. 2009; 67: 606-11\*
* Wayne MA. Intraosseous vascular access: devices, sites and rationale for IO use. *JEMS* 2007;32:S23-5.
* Frascone RJ, Jensen JP, Kaye K, Salzman JG. Consecutive field trials using two different intraosseous devices. *Prehosp Emerg Care* 2007;11:164-71\*
* Fowler R, Gallagher JV, Isaacs SM, et al. The role of intraosseous vascular access in the out-of-hospital environment (resource document to NAEMSP position statement). *Prehosp Emerg Care* 2007;11:63-6
* Miller L, Kramer GC, Bolleter S. Rescue access made easy. *JEMS* 2005;30:S8-18\*
* Davidoff J, Fowler R, Gordon D, et al. Clinical evaluation of a novel intraosseous device for adults: prospective, 250-patient, multi-center trial. *JEMS* 2005;30:S20-3\*
* Gillum L, Kovar J. Powered intraosseous access in the prehospital setting: MCHD EMS puts the EZ-IO to the test. *JEMS* 2005;30:S24-6\*
* Cooper BR, Mahoney PF, Hodgetts TJ, Mellor A. Intra-osseous access (EZIO®) for resuscitation: UK military combat experience. *JR Army Med Corps* 2008;153(4):314-6.
* Hixson R. Intraosseous administration of preservative-free lidocaine. http://www.vidacare.com/files/Hixson-Lidocaine-%20032012.pdf. Accessed November 22, 2013.

*\*Research sponsored by Vidacare Corporation*

*Vidacare disclaims all liability for the use, application or interpretation of this information in the medical treatment of any patient*.