

Comprehensive Protocol Development Guide

Training:

EZ-IO® infusion systems require specific training prior to use.

INDICATIONS:

EZ-IO® 25mm (40 kg and over) & EZ-IO® 15mm (3–39 kg) EZ-IO® 45mm (40 kg and over with excessive tissue)

Note: *Certain patients may require a Needle Set outside their ideal weight range "One size does not fit all"*

1. Immediate vascular access in emergencies.
2. Acute need for intravenous fluids or medications

CONTRAINDICATIONS:

- Fracture of the bone selected for IO infusion (*consider alternate sites*)
- Excessive tissue at insertion site with the absence of anatomical landmarks (*consider alternate sites*)
- Previous significant orthopedic procedures (*IO within 24 hours, prosthesis - consider alternate sites*)
- Infection at the site selected for insertion (*consider alternate sites*)

CONSIDERATIONS:

Flow rate: Ensure the administration of a rapid and vigorous 10ml flush with normal saline prior to infusion **"NO FLUSH = NO FLOW"**

- Repeat syringe bolus (flush) as needed

Pain: Insertion of the EZ-IO® in conscious patients has been noted to cause mild to moderate discomfort (usually no more painful than a peripheral IV). However, IO infusion for conscious patients has been noted to cause severe discomfort

- *If the patient responds to pain; 2% lidocaine without preservatives or epinephrine (cardiac lidocaine) has been demonstrated to be an effective local anesthetic for numbing the intraosseous space. As with any drug, always consult the pharmaceuticals DFU's prior to use and ensure the patient does not have an allergy or sensitivity to lidocaine.*
- *The prescribed dosage of 2% lidocaine without preservatives or epinephrine (cardiac lidocaine) must be infused slowly in 0.2 ml increments to prevent it from being sent directly into the central circulation. Titrated doses of the lidocaine should be given with increasing pressure as this will allow for expanded anesthetic effect in the medullary space. Following administration of the prescribed dose, it is crucial that you wait a minimum of 15-30 seconds for the drug to reach maximum anesthetic effect before giving the bolus. Lidocaine is to be used as an anesthetic and not as analgesia and repeated dosing may be necessary.*
- ***Consult pharmaceutical DFU's for lidocaine 2% (preservative and epinephrine-free) prior to infusion**
- ***Medical Director must authorize appropriate dosage range**
Pain Management Bibliography available to aid decision (M-220)
- ***Do not exceed 3mg/kg/24hr**

EQUIPMENT:

- One (1) EZ-IO Power Driver
- Appropriate size intraosseous Needle Set based on patient size and weight
- EZ-IO 15mm 3-39 kg
- EZ-IO 25mm 40kg and greater
- EZ-IO 45mm 40kg and greater with excessive tissue
- One (1) EZ-Connect®
- Two (2) 10 ml syringes
- Sterile saline solution for flush **Note:** 2% lidocaine without preservatives or epinephrine (cardiac lidocaine) for patients responding to pain
- Non-sterile non-latex gloves
- Antiseptic agent per institution protocol
- One (1) semi-permeable transparent dressing (optional)
- One (1) sterile 2x2 or 4x4 gauze pad
- One (1) (appropriate volume and type) intravenous solution
- One (1) fluid administration set (institution specific)
- One (1) fluid administration pump or pressure bag (institution specific)
- EZ-Stabilizer
- EZ-IO wrist band

PROCEDURE: *If the patient is conscious, explain procedure*

- Apply non-sterile latex free gloves
- Cleanse site using antiseptic agent per institution protocol
- Allow to *air dry thoroughly*
- Connect appropriate Needle Set to driver
- Stabilize site

- Remove needle cap
- Insert EZ-IO needle into the selected site. IMPORTANT: Keep hand and fingers away from Needle Set
- Position the driver at the insertion site with the needle set at a 90-degree angle to the bone surface. Gently pierce the skin with the Needle Set until the Needle Set tip touches the bone.
- Ensure visualization of at least on black line Needle Set
- Penetrate the bone cortex by squeezing driver's trigger and applying gentle, consistent, steady, downward pressure (allow the driver to do the work)
 - ***Do not use excessive force.** In some patients insertion may take greater than 10 seconds, if the driver sounds like it is slowing down during insertion; reduce pressure on the driver to allow the RPMs of the needle tip to do the work.
 - **In the unlikely event that the battery on the Driver fails clinicians may manually finish inserting the EZ-IO Needle Set. Grasp the Needle Set and, rotate arm, while pushing the needle into the intraosseous space. This may take several minutes.*
- Release the driver's trigger and stop the insertion process when a sudden "give or pop" is felt upon entry into the medullary space or when desired depth is obtained
- Remove EZ-IO Power Driver from Needle Set while stabilizing the catheter hub
- Remove stylet from catheter by turning counter-clockwise and immediately dispose of stylet in appropriate biohazard sharps container
 - ***NEVER** return used stylet or cartridge to the EZ-IO kit
- Secure site with EZ Stabilizer
- Connect primed EZ-Connect to exposed Luer-lock hub
- Confirm placement
- Syringe bolus: flush the catheter with 10 ml of normal saline
 - * If the patient is responsive to pain the clinician should consider 2% lidocaine without preservatives or epinephrine (cardiac lidocaine) for anesthetic effect prior to the 10ml normal saline flush and it may be necessary to administer additional lidocaine following the saline flush.
- Assess for potential IO complications
- Disconnect 10 ml syringe from EZ-Connect extension set
- Connect primed EZ-Connect extension set to primed IV tubing
- Begin infusion utilizing a pressure delivery system
- Secure tubing per institution policy
- Continue to monitor extremity for complications
- Place EZ-IO armband on patient, document time and date