EZ-IO® is an immediate vascular access option that provides peripheral venous access with central venous catheter performance. The EZ-IO® Vascular Access System uses the intraosseous space of the humerus and tibia as a large non-collapsible vein. The EZ-IO® needle has a uniquely designed needle tip that drills a hole in the bone the same size as the needle, minimizing the risk of extravasation or dislodgement. Insertion is gentle, fast and relatively painless.

WHO SUPPORTS IO ACCESS?
Intraosseous access is globally supported by many major medical societies and professional nursing organizations.

WHAT IS THE PREFERRED SITE FOR AN EZ-IO®?
EZ-IO® is indicated for humeral insertion (Figure 1)
- Average flow rate of 5 L/hour via humerus
- Well tolerated by conscious/alert patients
- Proximal or distal tibia are alternate insertion sites

WHY DOES MY PATIENT HAVE AN EZ-IO®?
- The patient needed vascular access
- The patient had limited or no venous access
- Due to limited time and resources
- To prevent multiple IV sticks and minimize patient pain/anxiety
- To minimize vascular access related complications and facilitate vein preservation

WHAT DOES IT LOOK LIKE?
There are three EZ-IO® needle sets to choose from. All are 15 gauge surgical stainless steel. The color of the catheter hub correlates to the catheter length; pink=15mm, blue=25mm, yellow=45mm. The site should be dressed with an EZ-Stabilizer™ dressing.

WHAT MEDICATIONS AND FLUIDS CAN BE INFUSED VIA THE EZ-IO® CATHETER?
Virtually any fluid and medication that can be safely infused via peripheral IV route may be safely infused through the IO route using the same dosage, rate and concentration. Adequate flow rates are dependent on periodically performing a syringe flush (Figure 2) and infusing fluids and medications under pressure via infusion pump, pressure bag (Figure 3) or syringe boluses.

PRIOR TO ADMINISTRATION OF MEDICATIONS OR FLUIDS, CONFIRM EZ-IO® PLACEMENT:
- Ability to aspirate blood
- Stability of catheter in the bone

WHAT IF I FEEL RESISTANCE ON THE LINE, OBTAIN LOW INFUSION RATES OR THE IV PUMP ALARMS?
Assess the IO site and if there is no evidence of complications, perform a rapid syringe flush of normal saline (5-10mL adult, 2-5mL infant/small child) into the IO space. This helps clear the intraosseous marrow and fibrin allowing for effective infusion rates. Periodic flushes may be necessary.

WHAT THINGS DO I NEED TO ASSESS AND DOCUMENT?
Frequent assessment is essential for safe vascular access management. Verify placement prior to each infusion and assess frequently for complications including extravasation which can lead to compartment syndrome. Assess for flow rates and physiologic or pharmacological effects of infusions. While an EZ-IO® is in place in the humerus, movement to the affected arm should be minimized and the arm should not be elevated above shoulder level. Patients should not go to MRI with an EZ-IO®, this should be part of your MRI Checklist.

HOW IS THE EZ-IO® REMOVED? ARE THERE AFTERCARE INSTRUCTIONS?
The EZ-IO® must be removed within 24 hours from the time of insertion. Remove any extension set and dressing and attach a luer-lock syringe to the hub. While maintaining axial alignment, twist the syringe and catheter clockwise while pulling straight out (Figure 4). Do not rock or bend during removal. Place the catheter into a designated sharps container for sharps containment and disposal. Apply gentle pressure as needed and apply a clean dressing to site. There are no activity restrictions after EZ-IO® removal.
**EZ-IO® Information Sheet: Care, Maintenance, and Removal**

**MY PATIENT STATES THE IO IS CAUSING PAIN. WHAT CAN I DO?**

- Observe recommended cautions/contraindications to using 2% preservative and epinephrine free lidocaine (intravenous lidocaine)
- Confirm lidocaine dose per institutional protocol
- Prime EZ-Connect® extension set with lidocaine
  - *Note that the priming volume of the EZ-Connect is approximately 1.0mL*
- Slowly infuse lidocaine 40mg IO over 120 seconds
  - Allow lidocaine to dwell in IO space 60 seconds
- Flush with 5 to 10mL of normal saline
- Slowly administer an additional 20mg of lidocaine IO over 60 seconds
  - Repeat PRN
- Consider systemic pain control for patients not responding to IO lidocaine

**Recommended anesthetic for ADULT patients 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

**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
- Prime EZ-Connect® extension set with lidocaine
- 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

**DOSING RECOMMENDATIONS WERE DEVELOPED BASED ON THE RESEARCH BELOW.**

For additional references, research and dosing charts, please visit www.eziocomfort.com


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