

# INTRAOSSUEOUS INFUSION - EZ IO

## OVERVIEW:

Alternative technique for establishing vascular access in critical patients (both pediatric and adult) when peripheral IV access may be difficult and/or time consuming.

## INDICATIONS:

- ❑ Situations where time critical fluids or medications need to be administered and peripheral IV access attempts have failed or are deemed likely to lead to significant treatment delay.

## CONTRAINDICATIONS:

- ❑ Fracture of the tibia or femur involving vascular compromise
- ❑ Previous orthopedic procedures (Example – knee replacement)
- ❑ An extremity that is compromised by a pre-existing medical condition (Example – tumor or peripheral vascular disease).
- ❑ Cellulitis or infection at the insertion site
- ❑ The inability to locate anatomical landmarks

## PROCEDURE:

**NOTE: AEMT may only perform procedure on Pediatric patients – Intermediate and above may perform procedure on both pediatric and adult patients**

- ❑ Palpate the landmarks to locate access site
  - Pediatric proximal tibial site one finger below and medial to tibial tuberosity
  - Pediatric distal tibial site one finger above medial malleolus
- ❑ Cleanse the site
- ❑ Prepare the EZ-IO Driver & select the appropriate sized needle for patient (usually 15mm – “Pink” or 25mm – “blue” needle)
- ❑ Open the plastic cover containing the IO needle and attach the needle set to the driver (you should hear and feel a “click” as the small magnet connects to the driver). Remove safety cap from needle.
- ❑ Begin insertion
  - Holding the driver in one hand while stabilizing the leg near the insertion site with the opposite hand
  - Position the driver at the insertion site with the needle at a 90 degree angle to the surface of the bone.
  - Without activating the driver, insert the needle through the skin at the insertion site until you feel the needle tip encounter the bone.
    - Verify that the 5 mm marking on the needle is visible. If this most proximal black line is not visible on the needle, you will either need to use a longer needle (e.g., 25mm) or change insertion sites – distal tibia.
  - Activate driver trigger & Apply light and steady pressure on the driver and power through the cortex of the bone, ensuring the driver is maintained at a 90 degree angle at all times.
  - Stop when the needle flange touches the skin or a sudden decrease in resistance is felt
- ❑ Remove driver from the needle set
- ❑ Remove the stylet from the needle by grasping the hub gently with one hand, and unscrewing the stylet counter clockwise - place it in a sharps container (do not replace or attempt to “recap” the stylet)
- ❑ Attach the extension set to the EZ-IO hub and then SYRINGE FLUSH the IO with a minimum of 10cc saline.
- ❑ Aspiration of a small amount of bone marrow with a syringe may be completed as a means to confirm placement. Use caution not to aspirate marrow past the extension set 90 degree elbow as occlusion may occur.
- ❑ Secure IV extension tubing only, not EZ-IO needle
- ❑ Initiate fluid administration under moderate pressure.

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- ❑ For the adult patient, may consider proximal humerus as an alternative insertion site.
  - Insertion site is located directly on the most prominent aspect of the greater tubercle. Slide thumb up the anterior shaft of the humerus until you feel the greater tubercle, this is the surgical neck. Approximately 1 cm (depending on patient anatomy) above the surgical neck is the insertion site.
  - Ensure that the patient's hand is resting on the abdomen and that the elbow is adducted (close to the body).
- ❑ In adult patient, flush the IO with a minimum of 10cc of saline following insertion noted above.
- ❑ Consider administration of Lidocaine – IO, to facilitate anesthesia at the IO site when performing the procedure on the conscious patient. Lidocaine should be administered 1 to 2 minutes prior to the administration of any fluid.
  - Adult Lidocaine: 40 mg
  - Pediatric Lidocaine: 0.5mg/kg

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## CONSIDERATIONS:

- ❑ Proximal tibial site (Adult): Medial to the tibial tuberosity
- ❑ Proximal tibial site (Peds): One finger below and medial to tibial tuberosity
- ❑ Distal tibial site (Adult): Two fingers above medial malleolus
- ❑ Distal tibial site (Peds): One finger above medial malleolus
- ❑ Contact Medical Control for Humeral site
- ❑ Do not use blood or bone marrow drawn from IO site for blood glucose determination.
- ❑ Do not allow IO procedures to delay transport
- ❑ Potential complications include
  - Fracture
  - Growth plate injury
  - Infiltration
  - Complete insertion

