



Madison County EMS

Updated 5-15-09



EZ-IO Guideline

This guideline is intended to be used as a supplement to the standard Madison EMS medical protocols. The EZ-IO may be attempted only on the critically ill or injured adult patient when IV fluids and/or medications are needed. It is not to be used when routine IV access is unsuccessful or difficult to establish, unless it is ordered by a medical command physician.

Indications: Adult patients (Greater than 35 kg or 16 years of age) who:

1. Need IV fluids or medications and a peripheral IV cannot be established in 2 attempts or 90 seconds **AND** exhibit 1 or more of the following:
 - a. An altered mental status (GCS of 8 or less)
 - b. Respiratory compromise (SpO₂ < 80% after appropriate oxygen therapy, respiratory rate < 10/min or > 40/min)
 - c. Hemodynamic instability (Systolic BP < 90mmHg)
2. EZ-IO may be considered PRIOR to peripheral IV attempts in the following situations:
 - a. Cardiac arrest (medical or traumatic)
 - b. Profound hypovolemia with or without alteration of mental status

Contraindications:

1. Fracture of the tibia or femur (consider alternate tibia)
2. Previous orthopedic procedures (IO within 24 hours, knee replacement)
3. Pre-existing medical condition involving that extremity
4. Infection at insertion site (consider alternate tibia)
5. Inability to locate landmarks (significant edema)

Procedure:

1. Wear approved body substance isolation.
2. Locate and cleanse insertion site using aseptic technique.
 - a. **Adult Tibial insertion site:** Extend leg, locate tibial tuberosity by feeling the anterior surface of the tibia approximately 2 finger widths down from the patella. Move 1 finger-width medially from the tibial tuberosity: this is the tibial insertion site.
 - b. **Adult Humeral insertion site:** Expose the shoulder and place the patient's arm against the patient's body, resting the elbow on the stretcher or ground and the forearm resting on the abdomen. Note the humeral head on the anterior-superior aspect of the upper arm, or the anterior-lateral shoulder. Palpate and identify the mid-shaft humerus and continue palpating toward the proximal end (humeral head). Near the shoulder feel for the small protrusion, this is the base of the greater tubercle and the insertion site. With the opposite hand, pinch the anterior and inferior aspects of the humeral head, while confirming the identification of the greater tubercle. This will help ensure that you have located the midline of the humerus.
3. Prepare the EZ-IO driver and needle set. If patient is obese, consider using the longer needle.
4. Stabilize extremity.
5. Insert EZ-IO needle set.
6. Remove EZ-IO driver from needle set while stabilizing catheter hub.
7. Remove stylet from needle set and dispose in sharps container.
8. **If the patient is awake and able to feel pain**, ensure no allergy to **Lidocaine**.
9. Prime extension set with a bolus of **Lidocaine 2%**. Confirm placement by aspiration of bone marrow, followed by infusion of lidocaine and 10 mL bolus of normal saline.
 - a. **Adult: Lidocaine 2% 20-40 mg SIVP over 15 seconds**
 - b. **Peds: Lidocaine 2% 0.5 mg/kg SIVP over 15 seconds**



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****Contraindicated in patients with bradycardia/2nd or 3rd degree AVB (with ventricular escape), rate <40 BPM****

10. In patients presenting with a contraindication to **Lidocaine**, consider **nitrous oxide** instead.
11. Connect the IV tubing, stabilize with kling on either side and tape down.
12. Place a pressure bag on solution being infused and adjust the flow rate, as desired.
13. Monitor EZ-IO site and patient condition.
14. Ensure receiving hospital is aware of EZ-IO placement with ID bracelet and the ease of device removal.