

## SANTA BARBARA COUNTY EMERGENCY MEDICAL SERVICES AGENCY

**INTRAOSSEROUS (IO) VASCULAR ACCESS****Attachment A - HUMERAL IO INSERTION**

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**I. Proximal Humerus Procedure – Indicated for patients  $\geq$  18-years-old****A. Position the patient's targeted arm in the position as indicated for Humeral IO placement.**

1. Positioning of the patient's arm can be safely and appropriately done using either of the approved techniques:
  - a. "Hand-to-Abdomen" Technique: Move the patient's hand (on the targeted arm) so that the palm rests over the umbilicus, while still maintaining the elbow close to the body.
    - i. This will result in adduction of the elbow and rotation of the humerus towards the body, effectively moving the biceps tendon away from insertion site.
  - b. "Thumb-to-Bum" Technique: Move the patient's hand (on the targeted arm) so that the patient's thumb and dorsal aspect of hand rest against the hip ("thumb-to-bum").
    - i. This will result in flexion of the elbow and rotation of the humerus towards the body, effectively moving the biceps tendon away from insertion site.
    - ii. This technique is preferred if utilizing Humeral IO during cardiac arrest; however, Humeral IO should only be utilized in a cardiac arrest if the following conditions are present:
      - a. Indications are not met for Tibial IO **and** other peripheral vascular access is not readily available.
      - b. Two (2) Tibial IO attempts have been performed unsuccessfully **and** Base Hospital Order has been obtained to perform a third (Humeral) attempt at IO vascular access.

**B. Locating the Insertion Site**

1. Place your palm on the patient's shoulder anteriorly; the "ball" under your palm is the general target area.
  - a. You should be able to feel this ball, on all patients, by pushing deeply
2. Place the ulnar aspect of your hand vertically over the axilla and the ulnar aspect of your other hand along the midline of the upper arm laterally ([Refer to Figure 1](#)).
3. Place your thumbs together over the arm; this identifies the vertical line of insertion on the proximal Humerus ([Refer to Figure 2](#)).
4. Palpate deeply up the humerus to the surgical neck.
  - a. This may feel like a golf ball on a tee – the spot where the "ball" meets the "tee" is the surgical neck.
  - b. The insertion site is 1-2 cm above the surgical neck, on the most prominent aspect of the greater tubercle.

**C. Insertion of the Humeral IO**

1. Aim the needle set at a 45-degree angle to the anterior plan and posteromedial.
2. Push the needle set tip through the skin until the tip rests against the bone.
  - a. **The 5 mm mark must be visible above the skin for confirmation of adequate needle set length**
3. Gently drill into the humerus approximately 2cm or until the hub is close to the skin; the hub of the needle set should be perpendicular to the skin.

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4. Carefully remove the IO needle. The catheter should feel firmly seated in the bone.

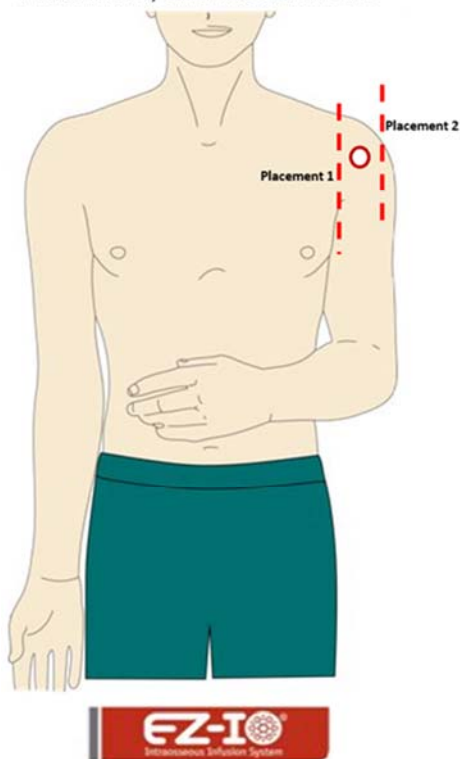
#### D. Securing the IO and Disposal of Used Equipment

1. Safely discard the used IO needle in the sharps container, and discard any equipment/supplies in the corresponding biohazard container.
2. Secure the device in place using the EZ-IO® Stabilizer
  - a. Use a longboard or sling to further immobilize the extremity prior to transport.
3. Attach appropriate saline lock and/or Normal Saline bag with primed IV tubing.
  - a. Ensure that pressure bag is located on Normal Saline bag
  - b. Aspirate for blood/bone marrow
    - i. Inability to withdraw/aspirate blood from the catheter hub does not mean the insertion was unsuccessful.
  - c. Flush with 5-10mL of Normal Saline.
4. Safely discard the used IO needle in the sharps container, and discard any equipment/supplies in the corresponding biohazard container.

- E. Prehospital personnel cannot remove Humeral IO once placed, unless otherwise directed by Base Hospital Physician.

## II. Reference Diagrams:

**FIGURE 1:** Hand-to-Abdomen (Umbilicus) Technique, Ulnar Hand Placement, and Insertion Site



**FIGURE 2:** Thumb Placement and Site Identification Technique, and Visualization of Humeral Insertion Site ("Golf ball & Tee")

