

# Intraosseous Cannulation

**Indication:** Patients who require intravenous interventions (e.g. medications, fluids) in whom intravenous access is either unsuccessful or impractical.

## GENERAL CONSIDERATIONS:

- Any medication that can be given via the intravenous (IV) route can also be given via the intraosseous (IO) route.
- IO access **SHOULD NOT** be attempted in long bones that are fractured. If there is evidence of overlying skin infection or burns, another site should be chosen.
- Routine use of pressure bag is recommended when delivering fluid via IO due to higher resistance.
- It is recommended to use D10 or D25 when administering dextrose via IO due to the higher viscosity of D50.

## PAIN MANAGEMENT:

- The pain of IO insertion is usually tolerable. Extreme pain is experienced with initial flushing the IO, as this displaces marrow to create a fluid cavity.
- **ADULTS:**
  - Administer 40mg of **Lidocaine 2%** **very slowly** to limit pressure in the bone while the anesthetic takes effect. The medication may need to dwell in the bone for at least 1 minute before the anesthetic takes effect.
  - If repeat dosing is required, another 20mg of 2% Lidocaine may be administered in a similar fashion.
- **PEDIATRICS:**
  - Administer 0.5mg/kg **Lidocaine 2%** (maximum 40mg) **very slowly** to limit pressure in the bone while the anesthetic takes effect. The medication may need to dwell in the bone for at least 1 minute before the anesthetic takes effect.
  - If repeat dosing is required, another 0.25mg/kg Lidocaine 2% (maximum 20mg) may be administered in a similar fashion.

## INTROSSOEUS NEEDLE REMOVAL:

- When necessary, an intraosseous needle can be removed by attaching a Luer-lock syringe to the needle and using it to rotate the needle clockwise while withdrawing it from the bone.

## EZ-IO® INSERTION:

1. Choose the correct size of needle. A needle that is too long can still be stabilized and used. A needle that is too short and doesn't enter the marrow space will not be functional.
2. Cleanse the skin with an antiseptic.
3. Attach the needle to the needle driver and insert it perpendicularly until the needle strikes bone. **At least one black line on the needle must be visible outside the skin or the needle will be too short to enter the marrow space.**
4. Depress the button on the driver to start drilling into the bone. The driver should be allowed to do the work with only modest pressure applied to it. The needle should not be forced into the bone during the process.



**NOTE:** If the driver fails, the needle may still be inserted by hand. Once the needle has been inserted through the skin, the hub should be grasped firmly and twisted into the bone while applying steady pressure.

5. Drill until a "pop" is felt and the needle enters the marrow space. At this point, completely release the button.
  6. Disconnect the driver from the needle.
  7. Stabilize the hub of the needle and separate stylet from hub by twisting it counter-clockwise. Withdraw the stylet and dispose in a sharps container.
  8. Place the adhesive stabilizer over the catheter hub.
  9. Attach a primed extension set to the needle and flush 5-10mL normal saline to create a fluid cavity.
- NOTE:** If the patient is conscious, consider administering lidocaine for pain control prior to use (see Pain Management above).

## JAMSHIDI® INSERTION:

1. Cleanse the skin with an antiseptic.
  2. Insert the needle perpendicularly until the needle strikes bone.
  3. Grasping the needle hub firmly, twist into the bone while applying steady pressure.
  4. Continue twisting until a "pop" is felt and the needle enters the marrow space.
  5. Stabilize the hub of the needle and separate the stylet from it by twisting it counter-clockwise. Withdraw stylet, dispose of it in sharps container.
  6. Stabilize the needle as an impaled object.
  7. Attach a primed extension set to the needle and flush 5-10mL normal saline through the line to create a fluid cavity.
- NOTE:** If the patient is conscious, consider administering **Lidocaine** for pain control prior to use (see Pain Management above).

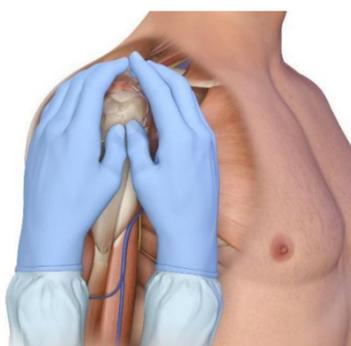
## APPROVED INSERTION SITES:

### PROXIMAL HUMERUS

Adduct and internally rotate arm.



Locate the "ball" (greater tubercle) of humerus.



### PROXIMAL TIBIA

Palpate tibial tuberosity below the patella.  
Feel for flat area medial (+/- superior) to the tuberosity.

