

Intraosseous Catheterization

What are the indications for Intraosseous Catheterization? Almost any medication or fluid that can be administered IV can also be administered IO, including blood products. It is not recommended to administer alkaline (sodium bicarbonate) or hypertonic solution through an IO catheter. IO catheterization, with or without a power drill, may provide more rapid parenteral access than IV catheterization in certain patients. Patients with small peripheral vasculature, peripheral vasoconstriction (due to shock, cardiovascular collapse or cardiorespiratory arrest), Polytrauma to the legs, or difficult IV access due to conformation (ex chondrodystrophic dogs) may benefit from rapid IO access. An IO catheter can act as a bridge for emergent treatment while simultaneously working on IV access. In most cases, an IO catheter is a short-term solution for parenteral access and should be removed once IV access can be obtained.

Where can an Intraosseous Catheter be inserted? The most common sites are the greater tubercle of the humerus and the flat medial surface of the proximal tibia or the tibial tuberosity, IO catheters placed in the humerus can deliver up to 120ml/kg/hr vs 36mls/kg/hr in the tibia.

In very small patients or neonates, the femur or wing of the ileum can be used.

What are the risks and contraindications of IO catheterization? An IO catheter should never be inserted into a broken bone. Additionally, an IO catheter should not be inserted through damaged or infected skin. The most common complications are dislodgment of the catheter and leakage of the infused fluid/medications into the surrounding tissues. Other potential complications include introduction of infection, bone fracture, nerve injury and compartment syndrome. Infusion of irritating, hypertonic, and alkaline solutions increase the risk of compartment syndrome.

Preparation for the use of the Intraosseous Power Driver

1. For all insertion sites, clip the skin of fur and perform a sterile scrub to the skin, in the same manner as placing an IV catheter. Given that intraosseous catheters are used most often in emergency situations, this should be completed rapidly and efficiently.
2. Choose the appropriate size needle set and remove from the sterile packaging.
3. Attach the needle set to the driver-there is a strong magnet that holds the needle in place on the driver.

4. Grasp the power driver with your dominant hand. Locate the site of insertion and firmly push the needle through the skin until bone is reached. Hold the skin taut with the other hand depress the trigger on the gun to drive the needle through the bone into the medullary cavity. Once the base of the needle is against the skin, release the trigger of the gun. Detach the gun from the needle base.
5. Remove the stylet by twisting the upper plastic portion off, revealing the lumen of the catheter.
6. A luer-lock syringe can be attached directly to the catheter, if desired. Attach a luer-lock syringe to the extension set and apply negative pressure to the line. If no blood or bone marrow contents appear within the line, flush a small volume of saline to clear any potential bony plugs from the catheter. Then try re-aspiration. Once blood or bone marrow appears, correct placement is confirmed and the catheter can be used for injections.