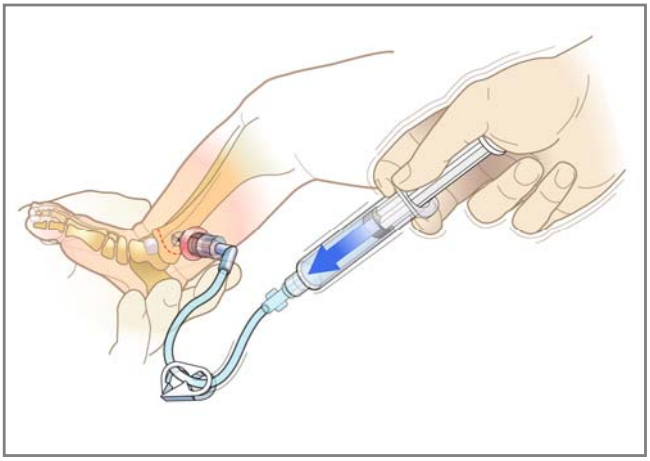
EZ-IO by vidacare

Immediate Vascular Access...
When You Need It Most

EZ-IO PD Distal Tibial Access



Training Program

The EZ-IO PD® was developed as a direct result of the need to improve intraosseous access in patients of smaller size.

The images and training that follow were designed to simplify IO understanding and improve emergency vascular access.

Our collective goal has long been Immediate, Safe and Effective vascular access for all critical patients. Vidacare's approach to this goal is simple - the right equipment - in the best hands - where it's needed most.

At the completion of this program if you still have questions or concerns please call us at 1.866.479.8500 or visit our web site at www.vidacare.com.

We at Vidacare® appreciate what you do and the time you devote to it. Thank you for inviting us to be a member of your team!

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Immediate Vascular Access...
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Indications for EZ-IO PD Access

- Altered level of consciousness
- Respiratory compromise
- Hemodynamic instability

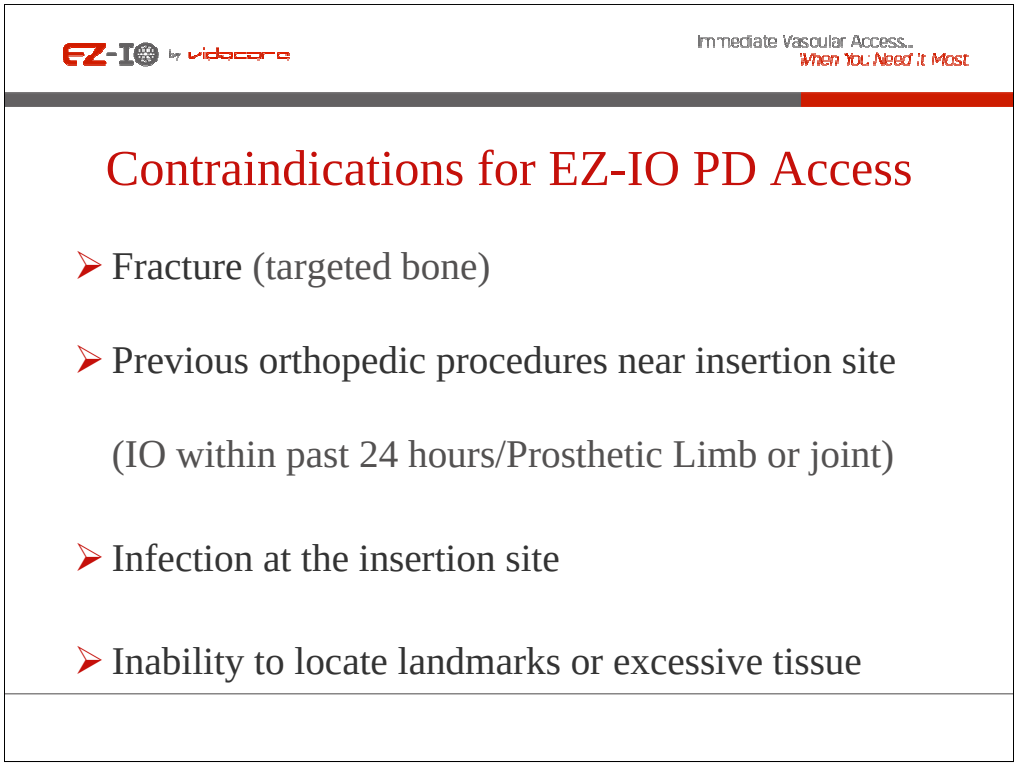
To gain immediate vascular access in an emergency

FOR PATIENTS WEIGHTING BETWEEN 3 – 39 KILOGRAMS

Listed here are the primary indications. Can you think of specific conditions that would fit each indications?

Examples of disease states often meeting these criteria include, but are not limited to the following:

Cardiac arrest, Status epilepticus, All shock states, Arrythmias, Dehydration Burns, Drug Overdose, DKA (diabetic), Renal failure, Stroke, AMI, Coma, OB complications, Thyroid crisis, Trauma, Anaphylaxis, CHF, Emphysema, Respiratory arrest, Hemophiliac crisis



These are the contraindications.

Recent fractures may cause fluid or drugs to leak – thus not reaching target tissue and possibly causing additional significant injury.

Certain Orthopedic procedures at or near the insertion site. An example of an orthopedic procedure that would cause problems for the EZ-IO® would be a joint replacement. This would render the IO space inaccessible secondary to the indwelling device. Another example would be a recent (within the past 24 hours) IO placement in the same extremity. This "extra penetration" might allow extravasation (leakage) into surrounding soft tissue from the initial IO site (that has not yet closed) . *Not all orthopedic procedures pose a contraindication or concern to EZ-IO® usage.*

Infections at the insertion site pose a risk because they could be introduced into the bone and systemic circulation.

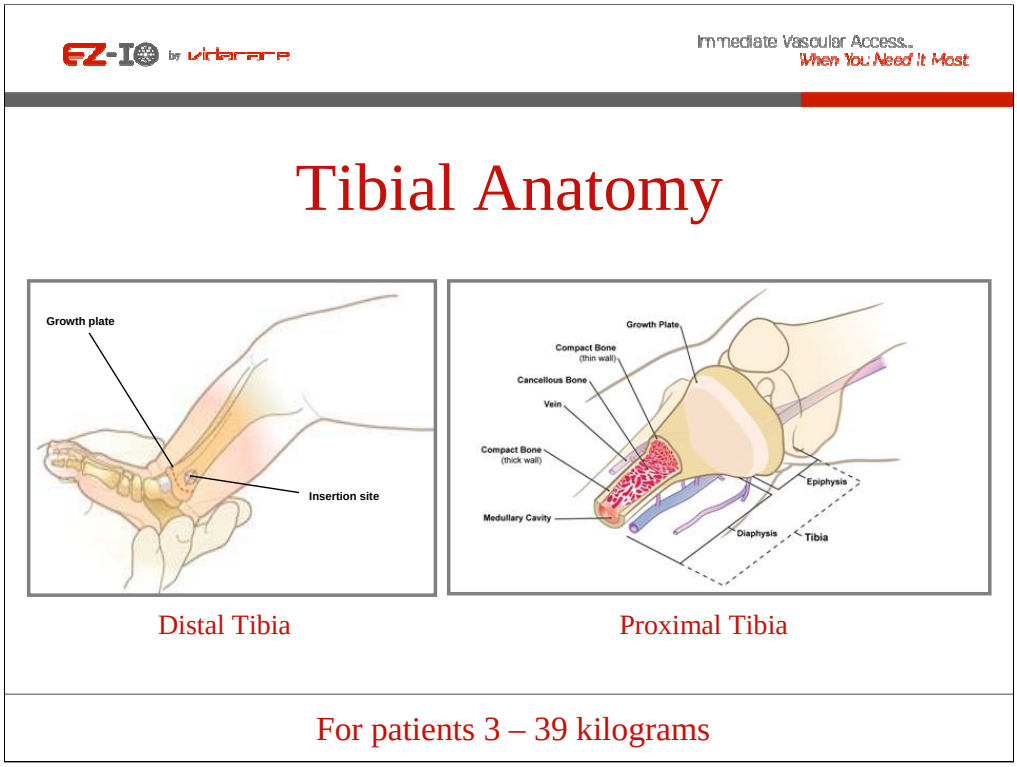
Inability to locate the EZ-IO® landmarks could result in an attempted placement that is unacceptable and dangerous.

Lastly, Excessive tissue over the insertion site may result in the needle set failing to reach the intraosseous space.

With each of the contraindication listed above the provider should consider alternate appropriate sites. Additionally, a risk versus benefit assessment should always be considered prior to any IO placement.

Observe Body Substance Isolation Precautions

Anytime you are providing care to the public it is important to protect yourself as well as the patient. Practicing proper Body Substance Isolation (BSI) is vital to quality patient care and is recommended anytime the EZ-IO® infusion system is in use.



Let's start with an anatomical overview. Here we identify the structures of the developing tibia. Important points to note include the thin cortex at the Epiphysis (located on the proximal and distal ends of the bone) versus the thicker compact bone on the Diaphysis. Note also the vasculature crossing from the cancellous bone, through the thin cortex and into the veins – this makes IO infusion possible!

The growth plate is of particular interest with regard to pediatric intraosseous placement.

There is a great deal of discussion and a substantial body of evidence surrounding the pediatric growth plate. The fear, though unproven, suggests that permanent injury may result from the placement of an IO catheter into the growth plate. At present there are no studies in the literature associating IO placement with growth plate injury.

Research in animal models suggests that inadvertent IO placement through the growth plate does not cause any long term deformity or complication. Additionally, follow up x-rays in pediatric patients, whose epiphyseal plates had been inadvertently penetrated by IO needles, failed demonstrate complications.

However, to be prudent you should always maintain a reasonable distance from the growth plate to avoid it's inadvertent penetration.

The following slides will assist you in the selection and confident placement of the EZ-IO PD® in the correct anatomical location (with due regard for specific developmental changes).

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Immediate Vascular Access...
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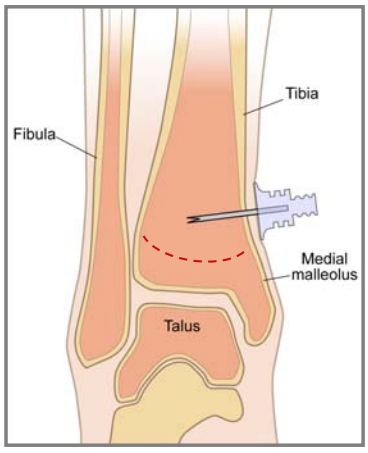
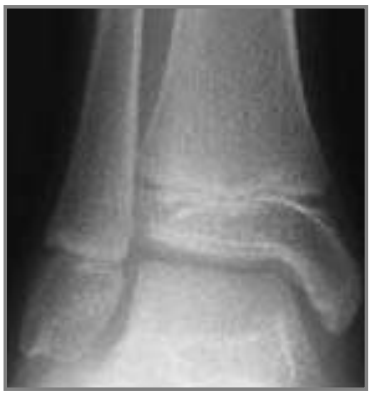
Distal Tibia Anatomy





X-Ray image of nine year patient

For patients 3 – 39 kilograms

Here we can identify the major structures of the lower leg as well as the **EZ-IO PD® landmarks**, the distal **Tibia** (the lower portion of the anterior lower leg bone), The **Medial Malleolus** (Ankle) and the insertions site - one finger width proximal to the medial malleolus – along the flat aspect of the medial distal tibia.

Important note: As the patient's size approaches 39 kg the practitioner should accommodate for the larger bone and joint space. Consider the EZ-IO AD (40 kg and greater) insertion site of two finger widths proximal to the medial malleolus.

If the patient "fits" on the Broselow™ Tape THINK PINK and use the EZ-IO PD

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The Broselow™ tape adds a straight forward decision making tool for the EZ-IO PD®.

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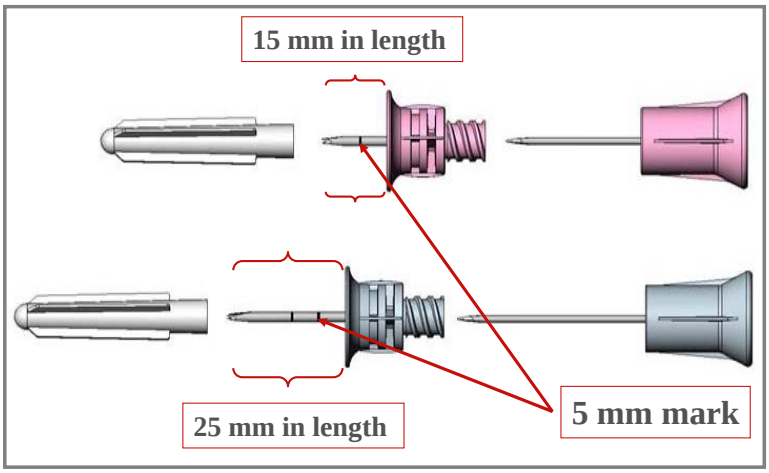
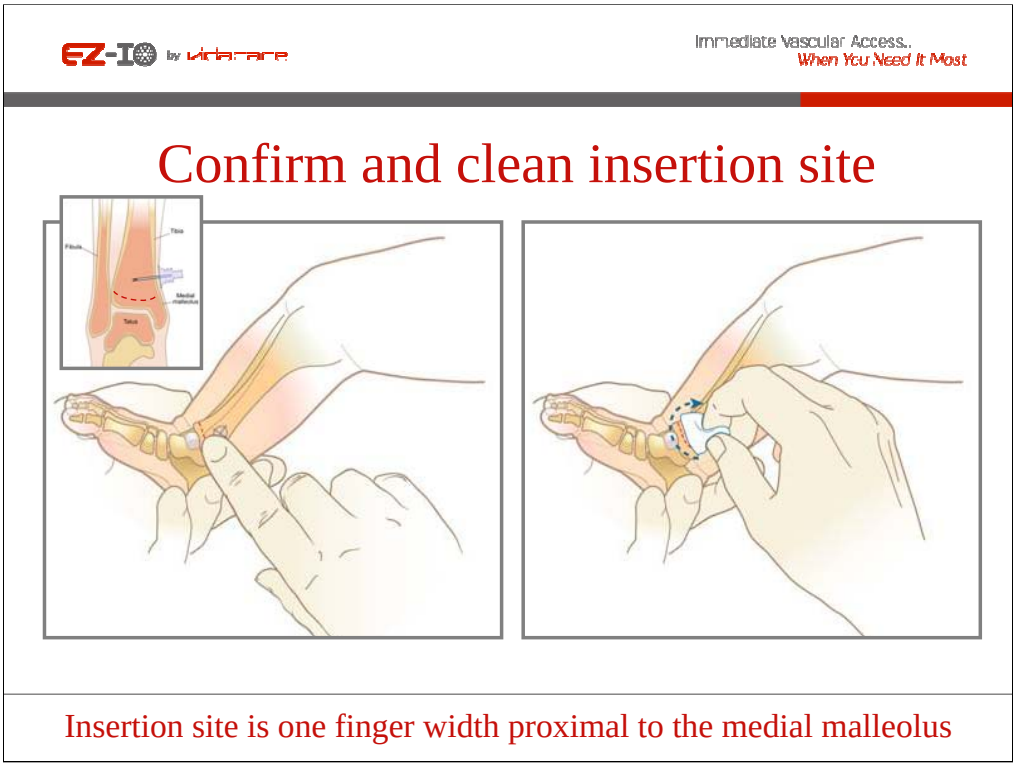
Immediate Vascular Access... When You Need It Most

EZ-IO PD & EZ-IO AD needle sets



Ensure selection of the appropriate catheter length for your patient

This slide compares the EZ-IO PD® to the AD®.

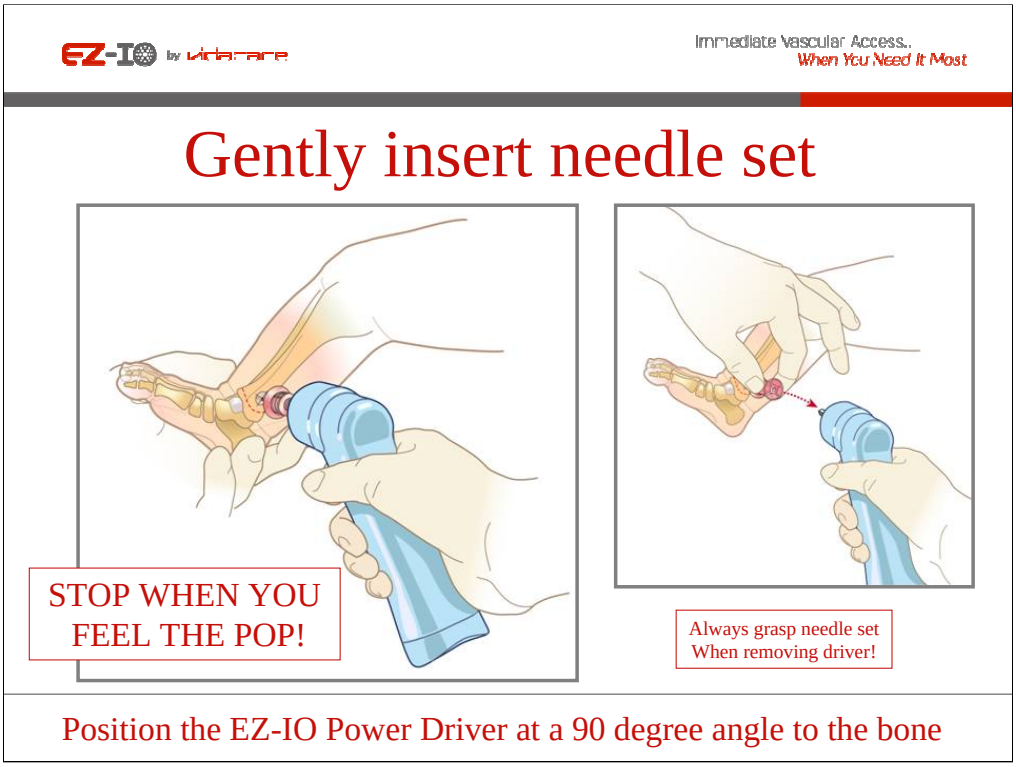


Here we can identify the major structures of the lower leg as well as the **EZ-IO PD® landmarks**, the distal **Tibia** (the lower portion of the anterior lower leg bone), The **Medial Malleolus** (Ankle) and the insertions site - one finger width proximal to the medial malleolus – along the flat aspect of the medial distal tibia.

Important note: As the patient's size approaches 39 kg the practitioner should accommodate for the larger bone and joint space. Consider the EZ-IO AD (40 kg and greater) insertion site - two finger widths proximal to the medial malleolus.

Helpful reminders: **"If you want to get in – think in!"** (rational – If you want to get inside (*the IO space or bone)* – think inside – (the *medial aspect of the leg.*)

"Big Toe – Go EZ-IO®" (rational – the EZ-IO PD® is placed on the medial (inside) aspect of the leg – the Big toes are found on the medial (toward the inside) aspect of the leg.

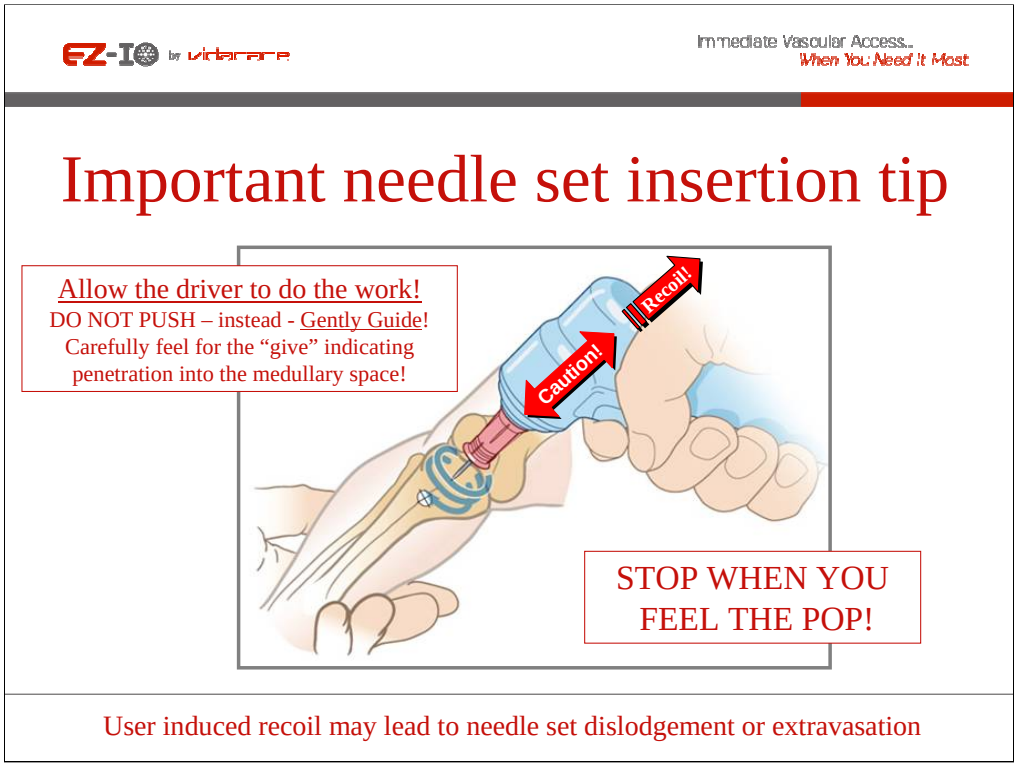


Hold the EZ-IO® Driver (with the appropriate Needle Set attached) **lightly** in your dominate hand.

Stabilize the leg and gently place the EZ-IO PD® Needle Set - maintaining a 90 degree angle during the insertion process.

STOP- WHEN YOU FEEL THE POP

IMPORTANT - Stabilize the needle set prior to any attempt at removing the driver. Failure to stabilize the needle set may cause inadvertent dislodgment.



Multiple insertions with the EZ-IO PD® training needle sets, drivers and mannequins will properly prepare you for your first IO placement. Keep in mind that you need to:

1. Place the needle set tip on the insertion site at a **90 degree angle** to the tibia.

2. **Lightly** hold the driver in your dominant hand.

3. **Allow the driver to do the work! Do not "pulse" or intermittently push the trigger** – complete the insertion in one "smooth motion".

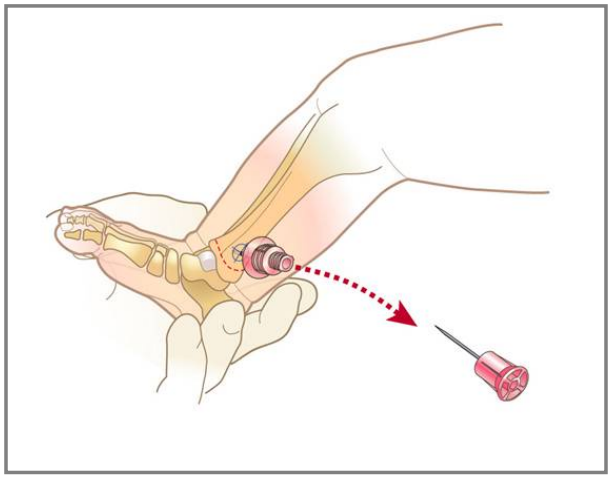
4. **DO NOT PUSH – instead – Gently Guide!**

5. **Carefully feel for the "give" indicating penetration into the medullary space!**

6. **STOP - WHEN YOU FEEL THE "POP"**

*Don't panic when you "feel the pop"! You have not penetrated the opposite cortex – simply release your finger from the trigger and allow the rotation of the needle set to slow while the needle tip advances another mm.

Remove the stylet

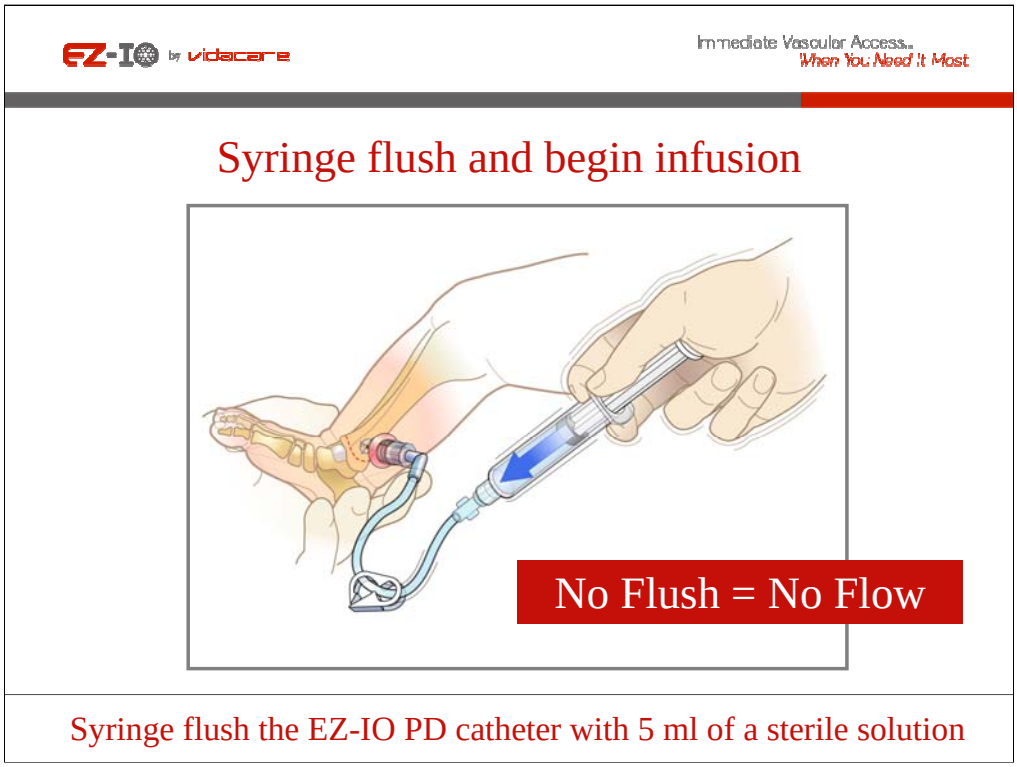


Grasp the catheter hub while gently removing the stylet

Remove the stylet from the catheter by grasping the hub and then rotating (unscrewing) the coupling end of the stylet counter clockwise. Once the stylet has been released - remove it from the catheter by continuing to grasp the hub and then gently pulling the stylet out. Be cautious with the sharp stylet.

At this point you may note blood slowly filling the catheter hub. This will serve as additional confirmation of placement.

The stylet tip may also be checked for the presence of blood or marrow by wiping the tip on a 4x4. This may additionally aid in confirmation of EZ-IO PD® placement.



Attach the EZ-Connect® extension set to the standard Luer lock & confirm placement of the catheter. This can be accomplished by identifying several important findings:

The catheter is firmly seated and does not move.

You note blood at the catheter hub.

You are able to aspirate blood or marrow from the catheter (We recommend aspiration of only a small amount of blood due to its extremely viscous nature).

Drugs or fluids flow without difficulty – there are no signs of extravasation (leakage) in or around the tissue. CAUTION : Conscious patients will experience pain with infusion prior to Lidocaine! Flow rates may be slow or non existent prior to the 5 ml syringe flush.

You may have checked the stylet tip for blood prior to placing it in the stylet shuttle or bio hazard container.

Other indicators of proper placement include:

Noticing the effects of administered drugs

X-Ray confirmation

Protect the sterile connection point on the catheter hub!

Four Important points to consider once the EZ-IO PD® has been established:

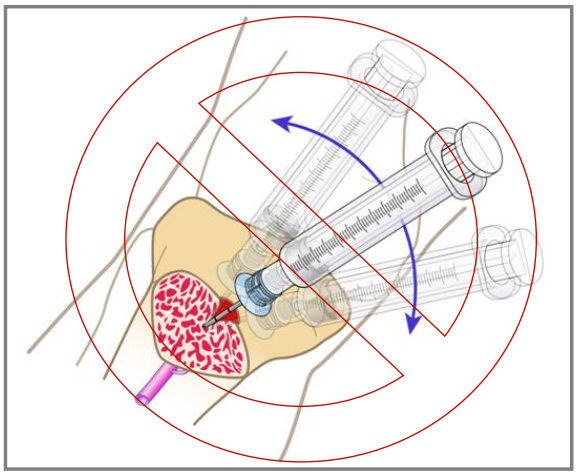
Routinely reconfirm that the EZ-IO PD® catheter is secure and in position.

Maintain appropriate protection at the insertion site guarding against accidental bumping or dislodgement.

Frequently monitor the EZ-IO PD®, the fluid and the extremity.

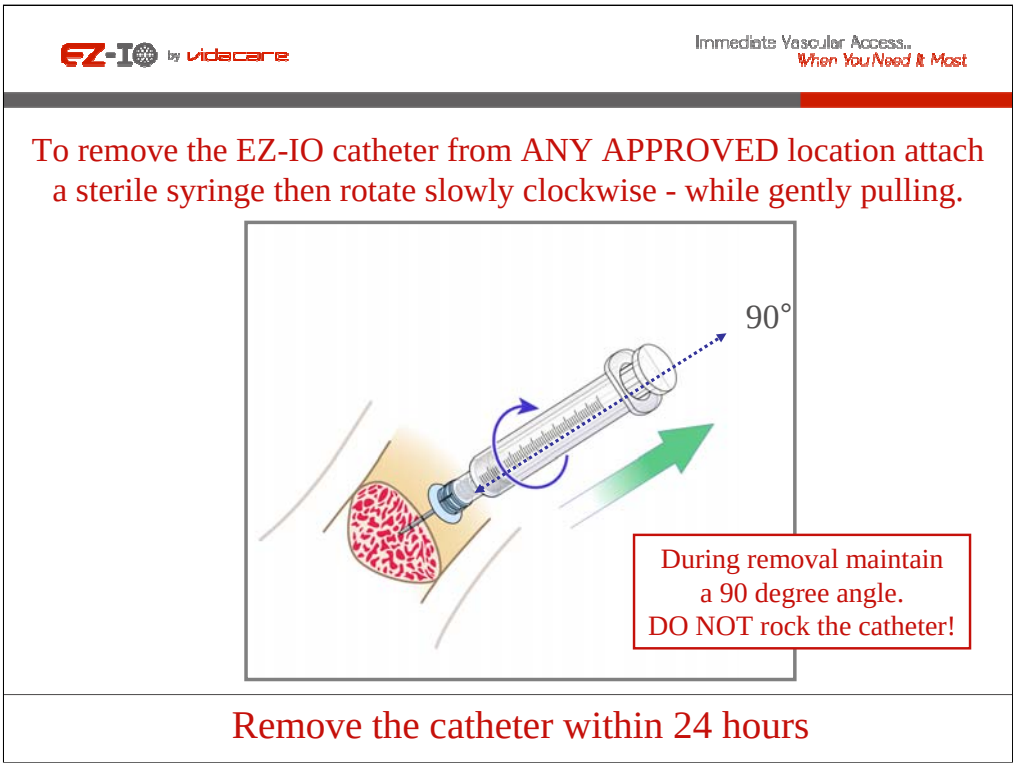
Remove the EZ-IO PD® within 24 hours.

Avoid rocking the EZ-IO catheter during usage



For added safety - use the EZ-Connect supplied with the needle set!

Do not connect a syringe directly the EZ-IO PD® during treatment. Use of the EZ-Connect® will help to avoid complications.



The EZ-IO® catheter should be removed within 24 hours!

Removal of the EZ-IO® catheter is simple. You may either grasp the hub directly or attach a sterile syringe. (The syringe will serve as a larger handle for the catheter hub and is preferred) Support the patient's extremity while rotating the catheter clockwise and gently pulling. (Recall that the exterior portion of the catheter is smooth and not threaded). Rotating the hub during removal reduces catheter to bone friction and will allow for an easier removal process. **Be careful with the sharp catheter once removed from the patient!** Once the catheter has been removed immediately place it in an FDA approved bio hazard sharps container. We recommend that you place a portable sharps container near the patient for this procedure (example - P2 Sharps Shuttle by Tyco/Kendall)

•Removal of the extension or fluid administration set, without proper protection of the EZ-IO® hub (in the form of a sterile cap, port or extension set), could cause bleeding or infection.

•Maintaining a 90 degree angle while rotating the catheter will insure proper removal without complications.

*** Be certain that you DO NOT ROCK the catheter while removing. Rocking or bending the catheter with a syringe may cause the catheter to separate from the hub!**

If hub-catheter separation occurs use an appropriate hemostat to grasp and gently remove the catheter in the same manner as suggested above (rotating while gently pulling).