

EZ - IO ADULT INTRAOSSEOUS INFUSION

INDICATIONS:

- Intravenous access is indicated
- Two (2) unsuccessful peripheral intravenous attempts
- Patient is unresponsive to verbal stimuli/unconscious AND has one of the following:
 1. Cardiac arrest where the presenting rhythm is VENTRICULAR FIBRILLATION or PULSELESS VENTRICULAR TACHYCARDIA
 2. Impending arrest
 3. Shock

APPROVED I.O. SITES:

1. Proximal medial tibia
2. Distal tibia (medial malleolus)
3. Proximal Humerus

CONTRAINDICATIONS

- Infection at the site selected for insertion (choose alternate site)
- Fracture of the bone selected for IO infusion (choose alternate site)
- Excessive tissue preventing identification of landmarks (choose alternate site)
- Previous significant orthopedic procedures. (IO within 24 hours, prosthesis- choose alternate site.)

EQUIPMENT:

EZ-IO Driver	Tape
EZ-IO needle set	Sterile Gloves
10 ml syringe	Dressing
Normal Saline IV solution, regular IV tubing	Skin prep pad

PROCEDURE:

15. Select appropriate insertion site
16. Prepare insertion site using aseptic technique
17. Identify Landmarks:
 - i. **Proximal Tibia:** Palpate tibial tuberosity, move (2) fingers below and medial to it
 - ii. **Distal Tibia:** Palpate medial malleolus move fingers two (2) finger width above it
(inside ankle bone)
 - iii. **Proximal Humerus:** Adduct arm (humerus against body) with the elbow at 90 degrees, the hand on the umbilicus, and the elbow resting on ground or stretcher. Palpate the mid-shaft humerus continuing proximally toward the humeral head identifying a small protrusion, the greater tuberosity insertion site.

IO ADULT INTRAOSSEOUS INFUSION (cont.)

18. Prepare the EZ IO driver and appropriate needle set.
19. Stabilize site and insert appropriate needle set.
20. Drill until loss of resistance is felt.
21. Remove EZ-IO driver from needle set while stabilizing catheter hub
22. Remove stylet from catheter.
23. Confirm placement by attempting to aspirate bone marrow or blood
24. Flush with 10cc of normal saline
25. Assess for signs of infiltration
26. Begin utilizing pressure bag for infusion if IO flushes easily and no infiltration
27. Dress site, secure tubing
28. Monitor EZ-IO site for swelling
29. **MAXIMUM 2 ATTEMPTS (2ND ATTEMPT MUST BE AT ALTERNATE SITE)**

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MDC Approval: 4/7/09

IDPH Approval: 7/9/09


Implementation: 1/1/10

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The Right Site

Site selection is dependent upon:

- Absence of contraindications
- Accessibility of the site
- Ability to monitor and secure the site
- Desired flow rates



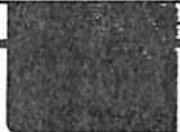
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The Right Needle

Selection based on:

- Needle Length (15 mm, 25 mm, and 45 mm)
- Soft tissue depth estimated by using your finger
- Visualization of a black line after penetration of the skin
- The 45 mm needle should be considered for all proximal humerus insertions - patients >40 kg
- Special situations
 - Excessive soft tissue
 - Excessive muscle tissue
 - Edema

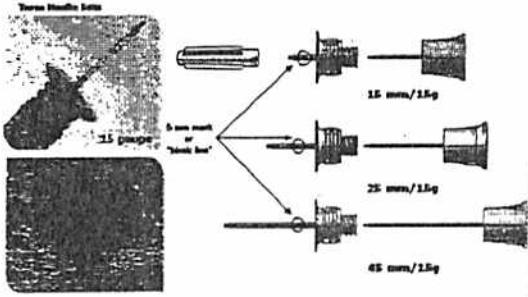


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Three Needle Sets

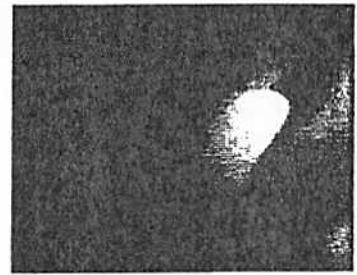
15 gauge
5 mm mark or "black line"



15 mm/15g
25 mm/15g
45 mm/15g

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Medication and Laboratory Analysis

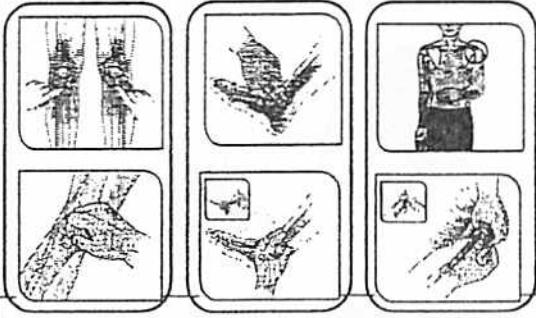
- Any medication that can be safely given through a peripheral vein can be given safely through an IO
- IO and IV doses are the same
- Follow each med administration with 3-5 ml fluid flush
- Laboratory Analysis:
 - > Draw 2 ml for waste
 - > Aspirate IO blood for standardized labs
 - > May use heparinized syringe



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Confirm and Clean Approved Insertion Site

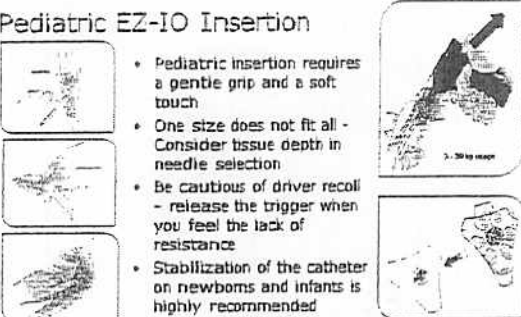


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Pediatric EZ-IO Insertion

- Pediatric insertion requires a gentle grip and a soft touch
- One size does not fit all - Consider tissue depth in needle selection
- Be cautious of driver recoil - release the trigger when you feel the lack of resistance
- Stabilization of the catheter on newborns and infants is highly recommended




1.08 Rev 1

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Prepare Equipment

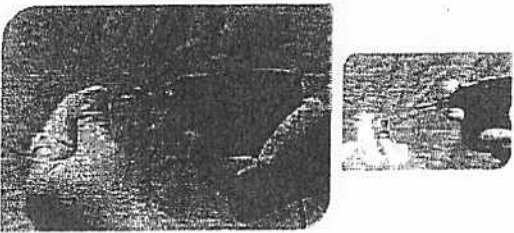
- Inspect needle cartridge or packaging for damage and sterility (verify seal)
- Open EZ-Connect and prime w/saline (or lidocaine for conscious patients)
- Leave syringe attached to EZ-Connect
- Open cartridge and attach driver to Needle Set (leave cap on needle until ready to insert)



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Remove Needle Set Safety Cap



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Stabilize Extremity



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Insert Needle Set at a 90° angle to the bone - insert through the skin until you touch bone



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Needle Size

Size matters!

Make sure that a black line is NOT visible above the skin

NO

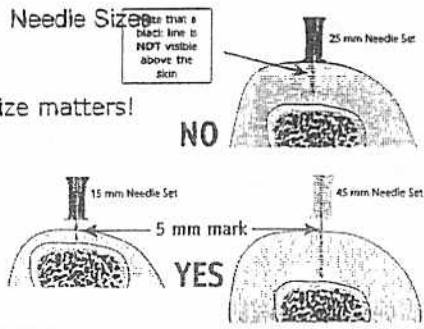
25 mm Needle Set

15 mm Needle Set

45 mm Needle Set

5 mm mark

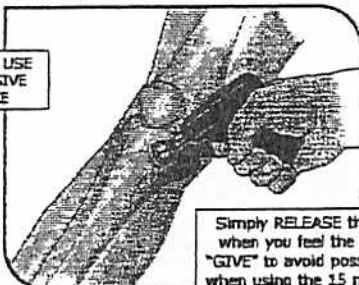
YES



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Needle Insertion


DO NOT USE EXCESSIVE FORCE



Simply **RELEASE** the trigger when you feel the "POP" or "GIVE" to avoid possible recoil when using the 15 mm needle

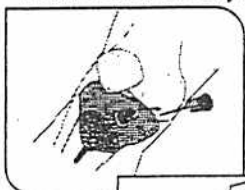
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Remove Driver from Needle Set

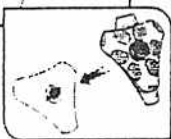


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Removal of the Stylet




- Stabilize Needle Set and rotate the stylet counter-clockwise
- Remove stylet and dispose of in approved bio-hazard sharps container




A stabilizer is available if needed

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Put Stylets Where They Belong . . .



45 mm Needle Set sharps protector

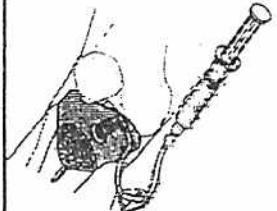


Portable sharps protector



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Confirm Catheter Placement



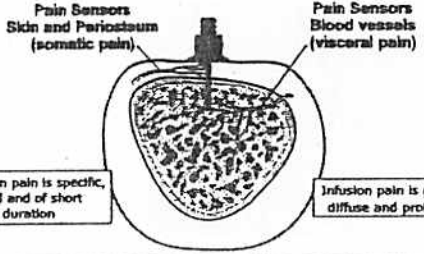
Confirm by noting one or more of the following:

- Firmly seated catheter
- Flash of blood in the catheter hub or blood on aspiration *
- Pressurized fluids flow without difficulty
- Pharmacologic effects

* may or may not be able to aspirate blood

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Intraosseous Usage and Pain



Insertion pain is specific, local and of short duration

Infusion pain is general, diffuse and protracted

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Anesthesia vs. Analgesia

- Lidocaine directly blocks the sensation of pain at the source
- 2% lidocaine without preservatives or epinephrine (cardiac lidocaine)- given IO - has been shown to offer effective local anesthesia in most patients responsive to pain

1-438-100-1

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Anesthesia vs. Analgesia


- Pain management with analgesic agents can cause systemic effects and may not eliminate local pain
- Analgesics alter the perception of pain while anesthetics block sensation

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The Right Lidocaine Administration


- *Prescribed dosages must be given slowly in small increments (give 0.2 ml at a time until pain is resolved)
 - As with any drug always consult the pharmaceutical DRI's prior to use
 - Ensure patient does not have an allergy to lidocaine
- Prime the extension set with lidocaine
- Allow 15-30 seconds for anesthetic effect, following administration of prescribed dose
- Repeat as needed for pain management
- Do not exceed 3mg/kg/24hr



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The Right Flush




- The IO space is filled with a thick fibrin mesh
- The medullary space must be pressure flushed to obtain maximum flow rates
- 10ml of normal saline is required for initial bolus
- Flush must overcome initial resistance felt with bolus administration
- More than one flush may be required to achieve maximum flow rate

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Syringe FLUSH Catheter

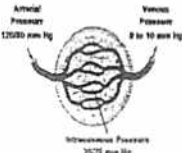


- Prime and use extension set
- **Reminder:** Patients responsive to pain usually require 2% lidocaine without preservatives or epinephrine (cardiac lidocaine) **intraosseous PRIOR** to syringe flush
- Some patients may require multiple syringe flushes

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The Right Amount of Pressure

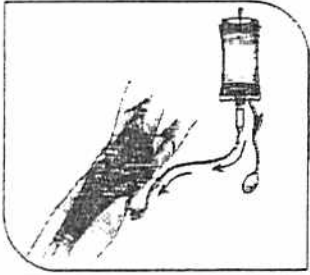



- The pressure in the medullary space is approximately 1/3 of the patient's arterial pressure
- Pressurizing fluids for infusion is required to obtain maximum flow rates
- For aggressive fluid resuscitation a rapid infuser may increase flow rates

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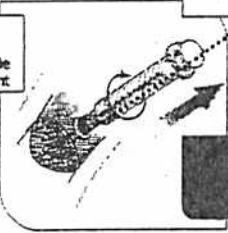
Infuse Fluids with Pressure

Regulate fluid delivery for ALL patients and take patient condition into account with amounts delivered

EZ-IO by **vidacare** Immediate Vascular Access... When You Need It Most™

EZ-IO Removal




Rotate syringe clockwise while pulling straight back

Maintain axial alignment - DO NOT rock the syringe

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The 5 Rights of the EZ-IO



1. The Right Site
2. The Right Needle
3. The Right Lidocaine Administration
4. The Right Flush
5. The Right Amount of Pressure

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Cleaning & Disinfecting

- Wipe clean with moistened cloth
- Spray with anti-microbial solution
- Momentarily depress trigger several times during cleaning
- Clean around drive shaft with cotton applicator - check to ensure nothing has attached to the magnetic tip
- Wipe dry
- Inspect driver and return to case or replace trigger guard

EZ-IO by **vidacare** Immediate Vascular Access... When You Need It Most™

Clinical Support

- Wrist band
- 24 hour Emergency Line
 - 1-800-680-4911
- www.vidacare.com
- Web Feedback form

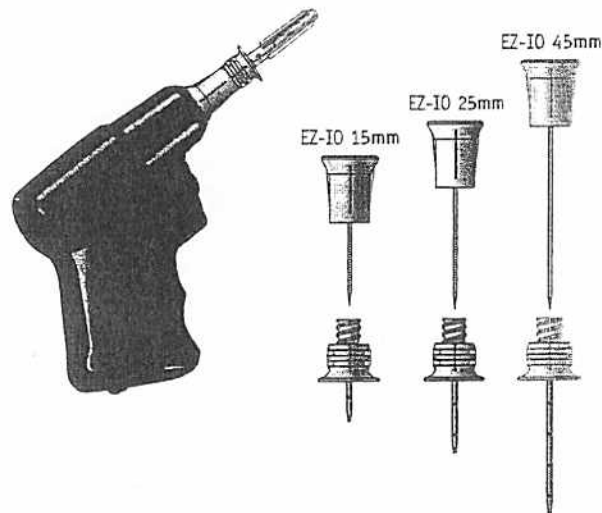
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Questions?

EZ-IO

1. EZ-IO® 15mm (3-39 KG), EZ-IO® 25mm (40 KG AND GREATER) AND EZ-IO® 45mm (EXCESSIVE TISSUE)

DEVICE DESCRIPTION: EZ-IO Needle Sets are comprised of a Safety Cap, a Stylet and a Catheter. When the Stylet is removed a standard Luer lock is exposed. Needle Sets are made of 304 Stainless and Catheters are 15 gauge. Needle Sets are provided sterile, non pyrogenic and in protective packaging. Needle Sets are intended for use with the EZ-IO Power Driver (Figure 1).



EZ-IO Power Driver and Needle Sets (FIGURE 1)

EZ-IO

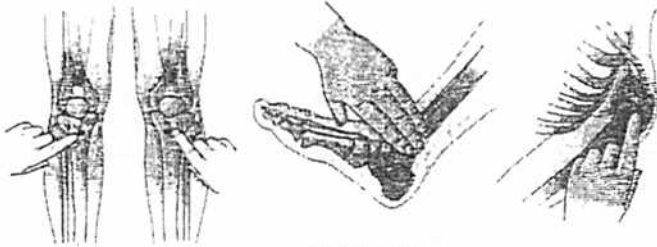


FIGURE 2

INSERTION STEPS:

1. BSI/PPE precautions.
2. Aseptic technique.
3. Locate insertion site. (Figure 2)
4. Prepare insertion site. (Figure 3)
Tibial site shown for clarity.
5. Prepare infusion system.
6. Ensure that the Driver and Needle Set are securely seated. (Figure 4)
7. Remove and discard the Needle Set Safety Cap from the IO Needle Set installed on the EZ-IO Power Driver. (Figure 5)
8. Insert EZ-IO Needle Set.

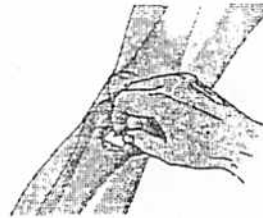


FIGURE 3



FIGURE 4



FIGURE 5

IMPORTANT: Only handle Needle Set by the plastic hub.

IMPORTANT: Control the patient's movement prior to and during Needle Set insertion.

- a. Position Driver at insertion site with Needle Set at a 90-degree angle to the bone. (Figure 6) **Gently** power or press Needle Set until Needle Set tip touches bone.
- b. Ensure at least 5 mm of the catheter is visible. (Figure 7)

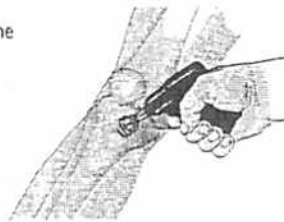


FIGURE 6

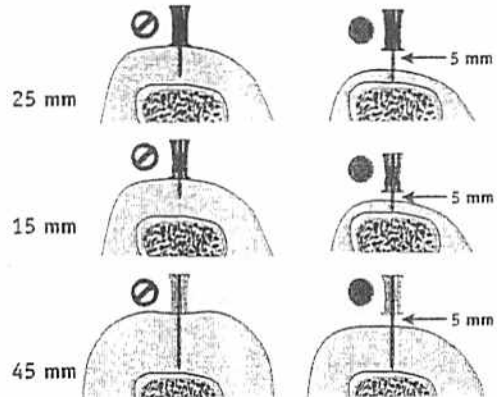


FIGURE 7

- c. Penetrate bone cortex by squeezing the Driver's trigger and applying gentle, steady downward pressure.
- d. Release Driver's trigger and stop insertion process when:
 1. A sudden "give" or "pop" is felt upon entry into the medullary space.
 2. The desired depth is obtained.

IMPORTANT:

Use gentle-steady pressure. DO NOT USE EXCESSIVE FORCE. Allow the Needle Set rotation and gentle downward pressure to provide the penetrating action.

Note: If the Driver stalls and will not penetrate the bone you may be applying too much downward pressure.

Note: In the unlikely event of a driver failure, remove the Power Driver, grasp the needle set by hand and advance the needle set into the medullary space while twisting the needle set.

9. Remove Power Driver and Stylet. (Figure 8)

10. Confirm Catheter stability.

11. Attach EZ-Connect® Extension Set. (Figure 9)

Prior to attaching the EZ-Connect® perform the following steps:

- a. Open Clamp if required.
- b. Attach female adapter to product source.
- c. Prime set and purge air.
- d. Attach male adapter to access device with a firm push and best motion.
- e. Engage the Luer lock collar in order to prevent accidental disconnection.
- f. Continue with procedure for fluid transfer.

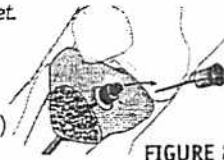


FIGURE 8

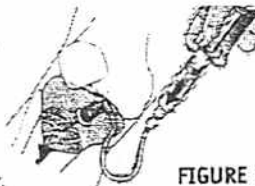


FIGURE 9

DO NOT ATTACH A SYRINGE DIRECTLY TO THE EZ-IO CATHETER HUB EXCEPT WHEN DRAWING BLOOD FOR LABORATORY ANALYSIS, WITH THE NEEDLE SET STABILIZED.

12. Flush the EZ-IO catheter with 10 ml of Normal Saline.

IMPORTANT:

- Prior to flush consider the aspiration of a small amount of blood to confirm placement.
- Consider IO 2% lidocaine without preservatives or epinephrine (cardiac lidocaine) for patients responsive to pain prior to flush. Follow institutional protocols/policy.
- Medications intended to remain in the medullary space, such as a local anesthetic, must be administered very slowly until the desired anesthetic effect is achieved.
- **NO FLUSH = NO FLOW.** Failure to appropriately flush the EZ-IO catheter may result in limited or no flow. REPEAT FLUSH AS NEEDED.
- Once EZ-IO catheter has been flushed, administer fluids or medications as indicated.

Note: Frequently monitor the insertion site for extravasation.

13. Apply dressing and EZ-IO wristband.

14. Remove catheter from patient.

Attach Luer lock syringe, continuously rotate clockwise while slowly and gently applying traction to catheter. **DO NOT**

ROCK OR BEND THE CATHETER

DURING REMOVAL. (Figure 10)

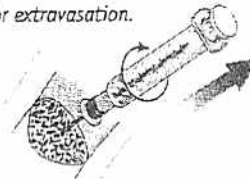


FIGURE 10

Once removed, immediately place catheter in appropriate sharps container.

15. Dress site as appropriate.

CAUTION: Do not leave the catheter inserted for longer than 24 hours.

Education and training materials available at Vidacare.com

EZ-ID

Vidacare.com

U.S. AND CANADA 24 HOUR TOLL FREE

EMERGENCY NUMBER:

1-800-680-4911

vidacare

4350 Lockhill Selma, Suite 150

Shavano Park, Texas 78249

1 866 479 8500

Vidacare.com

R_x CAUTION: Federal (U.S.A.) law
restricts this device to sale by
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EZ-IO® Competency Exam

Name: _____ Date: _____

1. T or F Optimal flow rates for the EZ-IO can be obtained using gravity drip rates.
2. T or F A rapid syringe bolus (flush) of the EZ-IO immediately after insertion will ensure optimal flow. "No flush, no flow"
3. T or F The EZ-IO is indicated for patients needing immediate vascular access and/or emergent additional vascular access.
4. Which of the statements concerning placement of the EZ-IO are correct?
 1. Grip the driver lightly & avoid excessive force during insertion
 2. Maintain a 90-degree angle to the bone during insertion
 3. Monitor the extremity for signs of complications
 4. Avoid attaching a syringe directly to the EZ-IO® catheter hub
 - a) 1, 2, & 3
 - b) 2, 3, & 4
 - c) 1, 3, & 4
 - d) All of the above
5. T or F For patients that respond to pain consider:
2% lidocaine without preservatives or epinephrine (cardiac lidocaine) - IO prior to initial sterile saline bolus or flush
6. T or F The 45mm needle is the recommended needle for the proximal humerus on patients weighing greater than 40kg.
7. T or F The proximal humerus offers better flow rates and is optimal for patients who respond to pain.
8. T or F In case of emergency, product failure or need for immediate assistance, clinicians should call the emergency number listed on the EZ-IO wristband and removal poster.
9. T or F The 25mm needle is only for adult patients and the 15mm needle is only for pediatric patients.
10. You are unable to aspirate blood when confirming placement, you should:
 - a) try to flush the IO while looking for signs of extravasation
 - b) remove the IO and try a new site
 - c) do not use the IO and continue looking for a peripheral IV site