Procedure: Central Venous Access Devices - Obtaining a Blood Specimen

Approved:

/s/
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Procedure: Central Venous Access Devices - Obtaining a Blood Specimen

**Essential Information**
1. Intravenous Therapy, Blood Draws via a VAD, and Venipuncture Competency Required. Do not return discard blood from CVADs locked with Heparin concentration > 100 units/mL (e.g., apheresis catheters are locked with Heparin 1000 units/mL).
2. PICCs smaller than 4 French are not recommended for blood draws.
3. When drawing blood or flushing a CVAD, use only a 10 mL syringe or larger to prevent catheter rupture.
4. Vacutainers may not be used to directly draw blood from PICCs or midlines.
5. Manufacturer’s guidelines state that central catheters placed in adults must be flushed with 20ml 0.9% sodium chloride post blood draw and TPN infusion. For pediatric patients follow flushing guidelines.
6. Current literature does not support the return of discard blood in adult patients.

**Equipment List**
1. Four way stopcock with male luer lock
2. Vacutainer holder with luer adapter attached or 10 mL syringe for obtaining blood specimens
3. Blood collection tubes
4. 10 mL or 20 mL syringe for obtaining discard blood
5. Alcohol swabs
6. Two (2) Pre-filled 10ml syringes containing 0.9% sodium chloride
7. Pre-filled syringe containing Heparin, if required.
8. Non-sterile gloves
9. Mask
10. Sterile injection cap
11. Goggles (optional)

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<th>STEPS</th>
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<td>1. Perform hand hygiene.</td>
<td>1.</td>
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<td>3. Assemble four-way stopcock setup per figure 1, with either vacutainer or empty syringe most proximal to patient, then empty syringe at next port, then 10cc 0.9% normal saline syringe at end of stopcock. Turn stopcocks off towards the empty syringes/vacutainer and prime the four-way stopcock with saline.</td>
<td>3. Do not use syringes smaller than 10ml. Do not use vacutainers directly on PICC lines.</td>
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<td>4. Insure that all IV infusions have been turned off and all existing catheter clamps have been closed.</td>
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<td>5. For Injection Cap Collection: a. Perform hand hygiene for second time. b. Put on non-sterile gloves c. Attach blunt cannula to male luer lock end of double stopcock. d. Disinfect injection cap with alcohol and allow it to dry. Insert cannula through injection cap.</td>
<td>5. This is the preferred method for collection. If difficulty is encountered in obtaining specimens, attach double stopcock directly to catheter hub. Scrub the hub for 15-30 seconds.</td>
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c. Put on non-sterile gloves.
d. Disinfect injection cap with alcohol and allow it to dry
e. Connect male hub of closed loop system (four-way stopcock) to catheter.

6. Turn proximal stopcock off to syringe/vacutainer and distal stopcock off in direction of 0.9% sodium chloride syringe.

7. Using empty 10ml syringe at the distal port, draw blood into the syringe in the amount of waste/needed collection.

7. Minimum volume to discard when drawing blood through venous access device: http://intranet.cc.nih.gov/dlm/specimenguidelines/inlinedraws.html
   a. Blood cultures = 0 mL of blood
   b. Coagulation tests = 20 mL (for Heparinized lines). When possible, coordinate coagulation sampling with other specimen collections, drawing other specimens first and include this volume in the 20 mL discard. If specimens drawn do not equal 20 mL, discard the remainder of blood prior to collecting coagulation sample.
   c. Other lab tests = 5 mL - waste of 3ml may be enough in pediatric lines. Consult with DLM.
   d. Blood drawn from adults and children for research purposes should not exceed the blood volumes stated in M95-9: Guidelines for Blood Drawn for Research Purposes in the Clinical Center.

In pediatric patients, if necessary utilize a closed-loop system to permit reinfusion of blood.

8. Turn proximal stopcock valve off in the direction of the patient (catheter hub)

9. Place appropriate waste tube into vacutainer holder and allow blood to flow from 10 ml syringe into vacutainer tube and discard, unless obtaining blood cultures.

10. Turn proximal stopcock off to vacutainer.

11. Repeat steps 7-12 withdrawing appropriate amounts of blood first into 10ml syringe and then into appropriate tubes in appropriate sequence.

12. When all blood specimens are obtained, make sure proximal stopcock valve is off in direction of vacutainer holder and distal valve off in direction of empty 10cc syringe.

13. Inject with 0.9% sodium chloride solution, per CVAD Flushing guidelines PRO, using the push-pause technique by making frequent pauses (push-pause) while injecting the solution.

14. **For catheters not requiring heparin**, flush using the positive pressure technique by closing catheter clamp (or withdraw four-way stopcock) while flushing just

14. Positive pressure prevents blood from being pulled back into the catheter. Do not inject solution against a clamped catheter because this could damage the catheter.
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<td>15.</td>
<td>Before the syringe completely empties. <strong>For catheters requiring heparin and not to be reconnected to an infusion, remove 0.9% sodium chloride syringe from end of stopcock and attach heparin syringe.</strong></td>
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<td>16.</td>
<td>Make sure any clamps/stopcocks are open. Fill catheter with heparin solution using the “positive pressure” technique. <strong>Flush using the positive pressure technique by closing catheter clamp or withdraw four-way stopcock while flushing just before the syringe completely empties.</strong></td>
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<tr>
<td>17.</td>
<td>Remove stopcock connection from catheter hub.</td>
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| 18.  | **For Injection Cap Collection:**   
|      | a. Remove injection cap.   
|      | b. Disinfect injection cap with alcohol and allow it to dry. Attach new sterile injection cap to hub. **Priming new injection cap is not necessary.** |
| 19.  | **For Hub to Hub Collection:**   
|      | a. Disinfect injection cap with alcohol and allow it to dry.   
|      | b. Attach new sterile injection cap to hub. **Flushing new injection cap is not necessary.** |
| 20.  | Dispose of stopcock setup in a sharps container. |
| 21.  | Remove gloves. |
| 22.  | Document in approved electronic medical record. **For pediatric patients, document the amount of blood withdrawn (including waste) in an approved electronic documentation system or on an approved medical records form.** |
FIGURE 1: Double Stopcock and Vacutainer or Syringe Method (Closed Loop System)

1. Attach vacutainer holder or syringe for drawing blood (sampling syringe) to stopcock port closest to patient-end of the stopcock. Turn valve off in direction of vacutainer OR sampling syringe.
2. Attach empty 10 mL syringe to next port. Turn valve off to syringe.
3. Attach syringe of 0.9% Sodium chloride to female end of stopcock and flush air out of stopcock. Turn valve off to 0.9% sodium chloride syringe.

References:
1. Infusion Nursing Standards of Practice 2011, Journal of Infusion Nursing, 34 (1Suppl) S68-69
2. ONS guidelines 2012.

Contributing Policy
1. MAS policy M03-1: Patient Identification