Central Venous Catheter (CVC): Repair of Cracked Catheter Adaptor, Limb or Clamp

BCRenal
Provincial Health Services Authority

Table of Contents

This procedure is posted on the BC Renal website:
Health Professionals ▶ Vascular Access ▶ Resources

Direct link: www.bcrenalagency.ca/health-professionals/clinical-resources/vascular-access

IMPORTANT INFORMATION

This BC Renal guideline/resource was developed to support equitable, best practice care for patients with chronic kidney disease living in BC. The guideline/resource promotes standardized practices and is intended to assist renal programs in providing care that is reflected in quality patient outcome measurements. Based on the best information available at the time of publication, this guideline/resource relies on evidence and avoids opinion-based statements where possible; refer to www.bcrenalagency.ca for the most recent version.

For information about the use and referencing of BC Renal guidelines/resources, refer to http://bit.ly/28SFr4n.

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1.0 Practice Standard

Skill Level (Nursing): Specialized

Registered Nurses who have completed the required hemodialysis (HD) specialty education and who provide nursing care in a BC In-Centre and/or Community Renal Program AND have received the appropriate training for repairing cracked catheter adaptors, limbs or clamps may perform this procedure.

Need to Know:

1. This guideline applies only to cracks distal to the "Y" limb portion of a tunneled CVC.
2. If the crack is proximal to the "Y" limb portion, clamp the lumen segment of the catheter with a flat edged scissor clamp (stainless preferred) as close to the exit site as possible and notify the nephrologist immediately. **Do not attempt to repair this CVC.**
3. The clamp is always applied proximal to the crack (i.e., between the patient and the crack).
4. Use Routine (also known as "standard") precautions.
   - Perform hand hygiene.
   - Wear gloves (non-sterile to remove the dressing and sterile for the rest of the procedure), non-sterile gown and non-sterile mask/face shield during connect procedures. If institution policy is for a clean "no touch" procedure, then may wear non-sterile gloves throughout the procedure and change gloves as indicated.
5. Use clean (also known as "medical") aseptic technique, with additional precautions as follows:
   - Use *sterile* equipment and supplies and a "no touch" technique when handling the catheter and catheter ports and caring for the exit site.
   - Maintain a *sterile* drape under the catheter ports.
   - Use an antiseptic wipe and vigorously apply mechanical friction to clean the hubs of the catheter ports ("hub scrubs"). If Tego connectors present, use antiseptic wipe and vigorously apply mechanical friction to clean the connectors.
   - Use a separate antiseptic wipe for each clamp/limb/port/Tego connector.
   - Allow antiseptic to dry for maximal effect.
   - Leave hubs "open" (i.e., uncapped and disconnected") for the shortest time possible.
   - Use *sterile* normal saline in a syringe to flush the catheter lumens.

Notes re: antiseptics:

- The Center for Disease Control and Prevention guideline (CDC, 2011) suggests the use of the following antiseptic solutions: >0.5% chlorhexidine with alcohol, 70% alcohol or 10% povidone-iodine. They conclude there is not enough evidence to recommend one antiseptic over the others.
- The Society for Healthcare Epidemiology of America (SHEA) and the Infectious Diseases Society of America (ISDA) joint guideline (Marschall, 2014) suggest that alcoholic chlorhexidine may have additional residual activity (up to 24 hours) compared with 70% alcohol for this purpose.

6. Air embolus is a potential catastrophic complication of CVCs and the relative risk while accessing a CVC is high.

   Ways to reduce the risk:

   - **Never leave catheter ports unattended and open to the air; clamp ports when not being used.**
   - Place the patient supine in as flat a position as the patient can comfortably tolerate (e.g., Semi-Fowler's position).

2.0 Equipment

- Non-sterile gown
- Non-sterile mask (2)/eye protection
- Sterile gloves
- Sterile dressing tray
- Sterile drape (or sterile 4x4)
- 4 x 4 sterile gauzes (several)
- Antiseptic solution
- 1 x 3 mL sterile syringe filled with sterile NS
- 1 x 10 mL sterile syringe
- Sterile beta-cap adapter
- Sterile surgical scissors
- Sterile replacement clamp
- Supplies for flushing and locking, as needed.
- Garbage receptacle

3.0 Assessment & Interventions

Preparation:

1. Place the patient supine in as flat a position as the patient can comfortably tolerate.
2. Perform hand hygiene.
3. Don ***non-sterile*** gown (staff).
4. Don ***non-sterile*** mask (staff and patient) and eye protection (staff).
5. Gather supplies, including a 10 mL ***sterile*** syringe filled with ***sterile*** normal saline.

Access hemodialysis catheter lumens:

6. Don ***sterile*** gloves or, if using no-touch technique, clean gloves.
7. Using an antiseptic wipe, cleanse each port/Tego, clamp and limb using friction scrub for 30 seconds. Un-clamp, move clamp, clean under clamp segment, and re-clamp. Use new wipes for each port/Tego.
8. Place catheter limbs on a fresh, dry, ***sterile*** 4x4 drape/gauze. Air-dry.
9. Move the clamp of the "suspected" cracked limb as close to the "Y" hub as possible. Close clamp.
10. Ensure port clamps are closed. Remove the port cap/Tego of the "suspected" cracked limb and discard. Hub-scrub (i.e., cleanse the outer hub of the catheter to remove blood and contaminants that collect on the hub over time) port with antiseptic wipe. Discard wipe.

Identify location and repair crack:

11. Attach a 10 mL sterile syringe with normal saline to the port of the "suspected" cracked limb. Push in saline against the clamped catheter – saline will leak from the crack.
12. Using sterile scissors, cut proximal to the crack. Do not cut off any more than necessary of the catheter limb.
13. Discard damaged portion of the limb and, if broken, the clamp.
14. If the clamp needs to be replaced, slide a new clamp onto the lumen.
15. Insert the long-ringed end of the beta-cap adapter into the newly cut end of the catheter.
16. Push the adapter all the way in (up to the hub). Pull on the adapter to check it is a snug fit.
17. Connect 10 mL syringe and withdraw the air now in the limb of the catheter. Remove the 10 mL syringe.
18. Attach a 3 mL syringe filled with normal saline and instill the saline into the lumen. Slowly withdraw the saline until blood reaches the tip of a 3 mL syringe. Visualize the 3 mL syringe to see the amount of normal saline that has been withdrawn. The amount of normal saline is the new volume of the lumen. Record this volume as per unit policy.

Continue with dialysis:

19. Continue dialysis or flush and lock the lumen (refer to policy: Flushing and Locking a CVC).

4.0 Patient Education & Resources

- Do not use sharp objects like scissors or a razor near the catheter tubing.
- Notify kidney doctor (nephrologist) or dialysis unit for any of the following:
  - Redness, warmth, or pain along the catheter.
  - Oozing or drainage from catheter exit site.
  - Noticeable swelling or itching around catheter or neck.
  - Feverish and any of the above symptoms.
  - Part of the catheter that is outside the skin seems to be getting longer.
  - Catheter is accidentally pulled and there is bleeding around the exit site.
  - Gauze around the ports is damp for an unknown reason.
- If the catheter develops another hole or leak or the cap falls off, make sure that the catheter is clamped off between the problem area/ catheter tip and the body (move the catheter clamp up the catheter towards the body; if no clamp, kink the catheter with fingers to close the catheter off). Call 911.

Resource:

- *Care of Your Catheter*: BCR website, health information, vascular access, pamphlets: www.bcrenalagency.ca/health-info/managing-my-care/vascular-access

5.0 Documentation

- Document actions taken to repair the catheter and the new volume of the lumen as per unit protocol.

6.0 References

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7.0 Developed & Approved by

Developed by:

- BC Vascular Access Educators Group (VAEG)
- Renal Educators Group (REG)

Approved by:

- BCR Hemodialysis Committee (reviewed 2011 version; only minor changes in 2017 version)
- BCR Medical Advisory Committee (reviewed 2011 version; only minor changes in 2017 version)

For information about the use and referencing of BCR provincial guidelines/resources, refer to the table of contents.