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

Vascular Access Guideline

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This procedure is posted on the BC Provincial Renal Agency website – Health Professionals Channel – Vascular Access –
http://www.bcrenalagency.ca/professionals/VascularAccess/ProvGuide.htm

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. Standard/routine precautions are used to repair tunneled catheters to reduce the risk of transmission of blood-borne and other pathogens.
   - Wash hands before and after manipulation of the CVC and administration lines. If hands visibly soiled, wash with antimicrobial soap; if not, may use either an antimicrobial soap or alcohol hand sanitizer.
   - Wear gloves (non-sterile for some parts of procedure and sterile for other parts), non-sterile gown and non-sterile mask/face shield during repair procedure.

5. Medical/clean aseptic technique is used to repair tunneled catheters, with additional precautions as follows:
   - Use sterile equipment and supplies and a “no touch” technique when handling the catheter and catheter ports.
   - Maintain a sterile drape/gauze under the catheter ports.
   - Use a sterile antiseptic solution (see #6 for a list of recommended antiseptic solutions) and sterile gauze to clean catheter hubs (“hub scrubs”).
   - Use a sterile syringe and sterile normal saline to flush the catheter lumens.

6. Recommended antiseptic solutions, in order of priority:

<table>
<thead>
<tr>
<th>Solution</th>
<th>Required Drying Time</th>
</tr>
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<tbody>
<tr>
<td>Chlorhexidine gluconate 2% with alcohol</td>
<td>30 seconds (persistent antimicrobial activity, up to 48 hours)</td>
</tr>
<tr>
<td>Chlorhexidine gluconate without alcohol</td>
<td>2 minutes</td>
</tr>
<tr>
<td>Sodium hypochlorite 0.11% (ExSept Plus®) or Amuchina 10%</td>
<td>2 minutes</td>
</tr>
<tr>
<td>Povidone-iodine 10% (Betadine)</td>
<td>2 minutes</td>
</tr>
</tbody>
</table>

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

Ways to reduce the risk:
   - Place the patient supine in as flat a position as the patient can comfortably tolerate.
   - Never leave catheter ports unattended and open to the air; clamp ports when not being used.
2.0 Equipment

- Non-sterile gown
- Non-sterile mask/eye protection (2)
- Sterile gloves
- Sterile dressing tray
- Sterile drape (or sterile 4x4)
- 4 x 4 sterile gauzes (several)
- Antiseptic solution, preferably chlorhexidine gluconate 2% with alcohol
- 1x 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. Wash hands with antimicrobial soap.
3. Don non-sterile gown (staff).
4. Don non-sterile mask (staff and patient).
5. Open the tray and add supplies. Supplies to include a 10 mL sterile syringe filled with sterile normal saline.

Access hemodialysis catheter lumens:
6. Don sterile gloves.
7. Using a sterile 4x4 gauze soaked in an antiseptic solution, cleanse the port, clamp and limb of the “suspected” cracked limb using friction scrub for 30 seconds. Discard used gauze.
8. Place catheter limbs on a fresh, dry, sterile 4x4 drape/gauze. Air-dry (see point #6 under “need to know” for drying time).
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 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 *sterile* 4x4 gauze soaked in an antiseptic solution. Discard 4x4.

**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.
  - If the 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
• http://www.bcrenalagency.ca

5.0 Documentation

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

6.0 References


### 7.0 Developed By

1. BCs Vascular Access Educators Group (VAEG).
2. Adapted from Fraser Health Renal Program guidelines/standards.

### 8.0 Reviewed By

1. British Columbia Renal Educators Group (BCREG)
2. BC Provincial Renal Agency – Medical Advisory Committee (MAC)