

Removal of Non-Tunnelled Hemodialysis Central Venous (CVC)

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Vascular Access Guideline

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This procedure is posted on the BC Renal website – Health Professionals - Vascular Access - Resources – Central Venous Catheter Guidelines: www.bcrenal.ca/health-professionals/clinical-resources/vascular-access.

1.0 Practice Standard

This guideline applies to In-centre and Community Dialysis Units (CDUs) in the majority of situations. If a site-specific protocol differs from this guideline, the site-specific protocol will take precedent.

This guideline does not apply to patients who are dialyzing at home.

Skill Level (Nursing): Specialized

1. *Registered Nurses* who have completed the required hemodialysis (HD) specialty education and who provide nursing care in a BC In-Centre and/or Community Dialysis Unit; and/or
2. *Registered Nurses* who have received training in central venous (CVC) care and maintenance, including those who work in intensive care and acute care settings.

Need to Know:

1. *Registered Nurses* may remove *non-tunnelled* central venous catheters (CVCs) upon the order of a physician. Physicians remove *tunnelled* CVCs.

2. Air embolus is a potential catastrophic complication of CVCs and the relative risk while removing a CVC is high. Ways to reduce the risk:
 - a) Place patient supine, either flat or in the Trendelenburg position, with the access site lower than the heart.
 - b) Instruct the patient to take a deep breath and hold it while the CVC is being pulled out, creating a Valsalva response.
3. Bleeding during or after the procedure is a potential risk. Prior to removal, assess bleeding risk. If indicated, check INR.
4. Prior to patient contact, perform hand hygiene. Don appropriate PPE based on the patient's need for isolation precautions or the risk of exposure to body fluids. Refer to BCR guideline [Prevention of Disease Transmission in HD Units](#).
5. Sterility of "key parts" must be maintained during CVC removal.
 - 5.1 "Key parts" include:
 - a) Skin surrounding CVC exit site to the border of the dressing
 - b) Inside of the sterile gauze used to stop the bleeding
 - c) Inside of the fresh sterile dressing where it will contact the skin after the bleeding stops
 - 5.2 Aseptic non-touch technique may be used IF sterility of "key parts" can be maintained.
 - 5.3 Sterile supplies are used as needed to maintain sterility of "key parts." Do not open supplies in advance of the procedure. For CVC removal:
 - A sterile dressing tray (or equivalent) is recommended.
 - Unless sterile gloves are utilized:
 - i. Gloved hands must not come into contact with "key parts."
 - ii. Swab sticks (vs wipes) are recommended for cleaning the exit site prior to removal. If swab sticks are not available, clean gloves and antiseptic soaked wipes picked up by forceps from a sterile dressing tray may be used.
6. Recommended antiseptics for CVC removal:
 - 6.1 Cleansing skin prior to CVC removal
 - 1st choice: 2% chlorhexidine (CHG) with 70% alcohol.
 - Application time: 30 seconds
 - 2nd choice:
 - 2% chlorhexidine without alcohol - application time: 30 seconds; OR
 - 70% alcohol - application time: 30 seconds; OR
 - 10% povidone-iodine – application time: 60 seconds

If all options have failed and, after consultation with vascular access team or nephrologist:

- 0.057% sodium hypochlorite (Anasept) –application time: 30 seconds¹ (single patient use only; 118 mL is the smallest bottle)

NOTES:

1. *Application time (contact time) is important to ensure the antiseptic contact time is long enough to achieve the desired “kill” time).*
2. *After applying the antiseptic, allow to air dry completely.*
 - *Adequate dry time allows the antiseptic to work AND, if using CHG, reduces the risk of CHG sensitivity and sensitization.*
 - *Amount of dry time depends on amount used, presence or absence of hair, humidity, body site, etc.*
 - *Dry time for preparations without alcohol is longer.*
3. *If skin is sensitive to chlorhexidine, utilize an alternative antiseptic until the sensitivity resolves. Assuming no previous anaphylactic reaction to chlorhexidine, consider a second trial after sensitivity resolves, ensuring adequate dry time after application.*
4. *DO NOT use normal saline:*
 - *As the primary cleaning solution as it does not have antimicrobial properties.*
 - *To rinse off the skin/CVC after applying an antiseptic. Antiseptics have residual antimicrobial action which lasts beyond the initial application.*
5. *Use single-use antiseptic preparations when available.*

6.2 Cleansing of CVC clamp and limbs

2% chlorhexidine (CHG) with 70% alcohol

- Application time: 30 seconds

OR

70% alcohol

- Application time: 30 seconds

See notes under 6.1 for details on application and dry times.

¹ www.clwk.ca/get-resource/anasept-skin-wound-cleanser

2.0 Equipment

- Personal protective equipment (gloves, gown, mask/eye protection)
- Clean gloves to remove old dressing
- Sterile dressing tray (or equivalent) (see #5 under “need to know” section)
- Sterile gloves (see #5 under “need to know” section)
- Sterile suture scissors
- 4 x 4 sterile gauzes (several)
- Antiseptic swab sticks/wipes (several)
- Normal saline & C&S swabs (2, for exit site and CVC tip)
- Sterile, air-occlusive dressing
- Tape

Note: To prevent contamination, do not open supplies until needed.

3.0 Assessment & Interventions

This procedure applies to removal of non-tunnelled CVCs which may be placed in the neck (jugular vein) or femoral vein (leg).

Preparation:

1. Gather supplies. Perform hand hygiene.
2. Place patient in a supine, either flat or in the Trendelenburg position with the CVC access site lower than the heart. Expose CVC access site.
3. Prepare aseptic field and organize supplies/dressing tray. Perform hand hygiene.
4. Don clean gloves and mask and other PPEs as required.

Remove dressing:

5. Remove exit site dressing and discard. Assess the exit site.
 - If ordered or if local infection is suspected, cleanse the exit site area with normal saline and swab for culture & sensitivity (C&S).
6. Remove gloves and perform hand hygiene.

Exit site care:

7. Don sterile gloves.
8. Using a dry, sterile 4x4 gauze, grasp and carefully lift the CVC limbs with one hand.
9. Using an antiseptic swab stick/wipe, cleanse the skin around the CVC exit site and under the CVC limbs thoroughly. Discard used swab sticks/wipes.

- Apply solution using repeated back and forth strokes, 15 seconds horizontally and 15 seconds vertically.
 - Continue until approximately 10 cm square area is cleaned.
10. Allow to air dry completely.
 11. Carefully remove the suture(s) that anchors the temporary CVC in place.
 12. Place a dry, sterile 4x4 gauze, folded into four, over the exit site (to help stop the bleeding when the CVC is removed).
 13. Instruct the patient to take a deep breath and hold it. While the patient is holding their breath, pull the CVC out:
 - Using a dry, sterile 4x4 gauze, grasp the CVC at its exit site from the skin.
 - Remove the CVC, pulling straight out and parallel to the skin while maintaining gentle, constant traction.
 - If resistance is met, stop the removal, secure the CVC, and contact the nephrologist.
 14. Apply pressure to the exit site and vessel entry site for a minimum of 10 minutes (longer if bleeding persists). Do not lift the 4x4 gauze to determine if bleeding has stopped (could cause an air embolus).
 15. Apply sterile, air-occlusive dressing over exit sites such as:
 - Paraffin or petrolatum dressing (e.g., Vaseline, Jelonet, Xeroform); OR
 - Petrolatum gauze (e.g., Adaptic) or gauze with a sterile petroleum-based ointment or jelly (e.g., Vaseline or polysporin), covered by a transparent film (semi permeable) dressing.Leave dressing in place for at least 24 hours.
 16. Inspect the CVC tip. Send tip for C&S if ordered or if a systemic infection is suspected.
 17. Keep on bedrest in a flat or reclining position for at least 30 min after CVC removal.

4.0 Patient Education & Resources

- Occlusive dressing will be in place for at least 24 – 72 hours.
- Notify kidney doctor (nephrologist) or dialysis unit for any of the following:
 - Oozing or drainage from CVC exit site.
 - Noticeable swelling or itching around neck.
 - Shortness of breath.
 - Feverish and any of the above symptoms.

5.0 Documentation

- Document date, time, procedure, integrity of the CVC, condition of the exit site, any bleeding and tolerance of the procedure.
- Document if exit site swab and/or CVC tip is sent for C&S.
- Document the procedure in Dialysis Access module in PROMIS.

6.0 References

The following references were considered in the development of this guideline.

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7.0 Sponsors

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For information about the use and referencing of BCR provincial guidelines/resources, refer to www.bcrenal.ca.