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MANITOBA RENAL PROGRAM

SUBJECT ▪ Alteplase for Clearing Hemodialysis Central Venous Catheter(CVC) Thrombosis using the Push (30 minute) Method	**SECTION** **30.20** Hemodialysis; Vascular Access **CODE** **30.20.08**
AUTHORIZATION ▪ Professional Advisory Committee, Manitoba Renal Program ▪ Nursing Leadership Council, St. Boniface General Hospital	**EFFECTIVE DATE** June 2005 **REVISION DATE** June 2010 May 2013 Oct 2015 October 2018

PURPOSE:

1. To describe the procedure for safe administration of a thrombolytic agent to treat thrombosis of non-tunneled or tunneled central venous catheter (CVC) for Hemodialysis.
2. To achieve optimal blood flow through the non-tunneled or tunneled CVC for Hemodialysis.

POLICY:

1. Alteplase is a thrombolytic agent used for the treatment of CVC-related thrombosis. CVC thrombosis should be suspected if there is a decrease in blood flow rate or an inability to withdraw blood or infuse fluid through the CVC. Once mechanical obstruction has been ruled out through visual inspection, patient re-positioning and manual irrigation of lumens, alteplase will be instilled as outlined in this procedure. The maximum dose used is 2 mg per lumen. There are minimal side effects at this dose but the patient should be monitored for signs of bleeding.

2. Hemodialysis nurses who have received instruction and have demonstrated competency to the renal educator or delegate may instill alteplase into the CVC as indicated on the standing Chronic Hemodialysis Physician's Order Sheet (#W-00109C).

3. May administer second dose of alteplase if the first dose was unsuccessful. Notify nephrologist and vascular access nurse (or Local Renal Health Centre community nurse) prior to the next treatment.

4. Registered nurses in ICU at St Boniface Hospital who have received instruction and have demonstrated competency to their educator or delegate may instill alteplase into the CVC when ordered by a physician.

5. Hemodialysis nurses are not required to obtain a physician order each time alteplase is instilled. The standing orders (as above) are intended for repetitive use.

6. Hemodialysis nurses must notify the nephrologist by the following hemodialysis day if alteplase has been instilled 2 times within a 2-week period.

7. A Home Hemodialysis patient educator or delegate will teach Home Hemodialysis patients the procedure. The patient must demonstrate an understanding of the protocol.

EQUIPMENT:

- 4 - 10 mL syringes containing 0.9%NaCl
- 2 - 10 mL syringes for withdrawal
- 4 – 3 mL syringe

KEY POINTS:

- 2 - vials alteplase (2 mg each)
- Sterile water for injection (without bacteriostat)
- 0.9% NaCl for injection
- Alcohol swabs
- Clean disposable gloves
- 4-Blunt fill needle

PROCEDURE:	**KEY POINTS:**
1. Check if patient has a history of active bleeding or platelets less than 135 X 10^{9} /Litre. It patient has a history of active bleeding, notify physician prior to instillation of Alteplase.	
2. Check if patient has received Alteplase in the past 2 weeks.	▪ If patient has received Alteplase (x1) in the past 2 weeks, notify physician/Vascular Access Nurse prior to next dialysis treatment.
3. Attach the blunt fill needle onto 3 mL syringe withdraw 2.2 mL of sterile water for injection and inject into a 2 mg alteplase vial.	▪ Final concentration = 1 mg/mL (vial contains 2.2 mg alteplase).
4. Swirl vial until contents are completely dissolved. Do not shake.	▪ Reconstituted solution should be colorless or pale yellow and transparent. ▪ Inspect vial. Discard if particulates are present.
5. Repeat Steps 3 and 4 for the second vial of alteplase.	
6. Attach the blunt fill needle withdraw 2 mL (2 mg) of reconstituted solution from each vial into 2 separate 3 mL syringes.	▪ Expiry of the solution is 24 hours after reconstitution when stored at 2 to 30 ° C
7. Access central venous catheter lumen following Procedure 30.30.02 *Accessing and Locking Dialysis Central Venous Catheter (Anticoagulant/ Thrombolytic/Antibiotic Locking) or 30.20.04 Use of Closed Needleless Access device with Hemodialysis Central Venous Catheters (CVC)*.	
8. Flush each CVC lumen with 10 mL 0.9% NaCl.	
9. Slowly instill sufficient volume of alteplase solution to fill volume of CVC lumen plus 0.1 mL.	▪ The extra 0.1 mL alteplase beyond the lumen volume will ensure alteplase gets to the tip of the CVC.
a. For CVC with lumen volumes <2 mL: If the lumen volume is <2 mL, only alteplase is instilled (to a volume equal to the CVC lumen volume + 0.1 mL). See example under "Key Point".	Example: ▪ For a 1.7 mL arterial lumen and a 1.8 mL venous lumen: o Instill 1.8 mL (1.7 mL + 0.1 mL) alteplase into the arterial lumen. o Instill 1.9 mL (1.8 mL + 0.1 mL) alteplase into the venous lumen.
b. For CVC with lumen volume ≥2 mL: If the lumen volume is ≥2 mL, a mixture of alteplase and sterile water for injection is instilled. This is because the maximum dose of alteplase is 2 mL (2 mg) per lumen. See example under "Key Point".	Example: ▪ For a 2.1 mL arterial lumen and a 2.2 mL venous lumen: o Total volume needed for arterial lumen: 2.1 mL + 0.1 mL = 2.2 mL. ▪ Instill 2 mL (2 mg) of alteplase + 0.2 mL sterile water for injection.

- Total volume needed for the venous lumen: 2.2 mL + 0.1 mL = 2.3 mL.
  - Instill 2 mL (2 mg) alteplase + 0.3 mL sterile water for injection.

10. Wait 10 minutes.

- Monitor patient for signs of allergic reactions (i.e. pruritus, edema). There is a very low risk of hypersensitivity reactions (<0.02%).
- Monitor patient for any signs of bleeding, particularly at any sites of recent trauma or venipuncture. The risk of bleeding is minor due to small dose of alteplase used (maximum dose = 4 mg).

11. Attach a 3 mL syringe with at least 0.6 mL of 0.9% NaCl to each catheter hub.

12. Instill 0.3 mL 0.9% NaCl into EACH CVC lumen.

13. Wait 10 minutes.

14. Instill another 0.3 mL 0.9% NaCl into EACH CVC lumen.

15. Wait 10 minutes.

16. Attach 10ml syringe to each lumen; attempt to aspirate both lumens of CVC.

17. Flush both CVC lumens with 10 mL 0.9% NaCl.

18. If CVC is clear, initiate hemodialysis.

19. May repeat rTPA push procedure x1. If unsuccessful, contact nephrologist.

- Per WHRA parental monograph maximum dose is 2 mg/lumen x 2 doses in a 24h period.

DOCUMENTATION:

- PRN Medication Administration Record (MAR)
- Integrated Progress Notes:
  - Time of administration
  - Blood flow rate prior to alteplase administration (if applicable)
  - Blood flow rate after alteplase administration

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