Huron Perth Healthcare Alliance		
1. Clinical Policies and Procedures	Original Issue Date:	August 05, 2016
Cathflo (Alteplase) Instillation	Review/Effective Date:	April 26, 2021
Approved By: VP People & Chief Quality Executive	Next Review Date:	April 26, 2023

Scope

This policy applies to all Registered Nurses who have received appropriate theoretical preparation to care for patients requiring Cathflo® (alteplase) instillation to restore patency of an occluded Central Venous Access Device (CVAD) at the Huron Perth Healthcare Alliance (HPHA).

Policy

The instillation of Cathflo® (alteplase) is indicated for the restoration of patency to an occluded or partially occluded Central Venous Access Device (CVAD) in order to ensure limited interruption of therapies, reduced risk of occlusion related complications (such as infection), and reduced trauma, psychological stress and cost relating to line replacement.

Purpose:

The purpose of this policy is to provide guidelines for RNs regarding the safe and effective instillation of Cathflo® (alteplase) for the purpose of restoring patency to an occluded CVAD, which is a skill that Registered Nurses have the authority to perform, under the order of a physician, provided the RN has the appropriate training, knowledge, skill and judgement as per the Regulated Health Professionals Act 1991. Please refer to the College of Nurses of Ontario standard – "Decisions about Procedures and Authority". It is expected that all staff shall adhere to the principles outlined in this policy.

Definitions:

Central Venous Access Device (CVAD) – Also known as a central venous line (CVL), or central venous catheter (CVC) is a catheter whose tip terminates in a great vessel. The great vessels include the aorta, pulmonary artery, superior vena cava, inferior vena cava, brachiocephalic veins, internal jugular veins, subclavian veins, external iliac veins, and common femoral veins. Neither the type of line alone nor the site of insertion can determine if a line is a CVAD. If the line terminates in a great vessel, it is a CVAD (National Healthcare Safety Network, 2012).

Patency - A CVAD is considered to be patent if it flushes easily and produces blood return easily upon aspiration.

Indications:

Cathflo® (alteplase) instillation is indicated for the restoration of patency in a CVAD, when other causes of occlusion (such as mechanical and chemical) have been ruled out.

Considerations:

- The drug product monograph for Cathflo® (Alteplase) outlines precautions, contraindications, and side effects to be aware of when using this thrombolytic for CVAD occlusion management, and should be used as the main reference for all precautions.
- Cathflo® (Alteplase) should not be administered to patients with known hypersensitivity to Alteplase or any component of the formulation.
- The most common adverse reaction associated with thrombolytics is bleeding; therefore, Cathflo® (Alteplase) should be used with extreme caution in patients:
    - With active internal bleeding
    - Who have had surgery or an obstetrical delivery within 48 hours
    - Who have had recent pulmonary embolism
    - With known or suspected infection in the CVL
    - Who have thrombocytopenia, or other hemostatic defects (including those secondary to severe hepatic or renal disease)
    - With any condition for which bleeding constitutes a significant hazard or would be particularly difficult to manage because of its location

- Who are at high risk for embolic complications (e.g., venous thrombosis in the region of the catheter)

- Prior to any intervention involving a Central Venous Access Device (CVAD) it is expected that nurses follow the related policies and procedures that apply to that type of CVADs. This includes utilizing 2 patient identifiers, performing hand hygiene, wearing appropriate PPE as indicated and using aseptic technique to access the line.

Competency Requirements:

An RN having participated in the HPHA CVAD/Cathflo Nurse Champion Training program and who has an understanding of the underlying condition for which this treatment is proposed and having demonstrated the appropriate knowledge, skills and judgement may perform this treatment on the order of a physician.

Procedure Chart:

Equipment:

- Appropriate PPE (as indicated per patient)
- Gloves
- Cathflo® (Alteplase) 2mg vial
- 10mL vial Sterile Water for Injection
- (2)10mL syringes
- Blunt tip needle
- (2) 10mL prefilled Sodium Chloride 0.9% syringes
- 2% Chlorhexidine/70% Alcohol swabs
- Completed medication label indicating “Alteplase instilled - DO NOT USE”
- End cap (prn adapter)
- Tape
- 3-way stop-cock (if using the stop-cock method)

Procedure for determining line patency

Procedure	**Rationale**
1. Assess catheter patency by attempting to flush the catheter with 10mL of Sodium Chloride 0.9% and aspirate blood. Do not use excessive force while attempting to flush or aspirate.	• In order to be considered patent, the catheter must both flush and easily produce blood return on aspiration.
2. Rule out mechanical causes of occlusion by ensuring clamps are open, checking for kinks, repositioning the patient, having them cough or raise their arms above their head.	• Excessive force when flushing may rupture the catheter or dislodge the thrombus into venous circulation. Excessive suction while aspirating may damage the vessel wall and collapse the catheter.
3. Rule out chemical occlusion via lipid aggregation or drug precipitates by reviewing the eMAR for solutions that have been infused.	• Lack of blood return or a sluggish flow may indicate a partial catheter occlusion. Either can be signs of a malpositioned tip, and further assessment of the line will be necessary.
4. Rule out external catheter thrombotic occlusion by assessing for symptoms such as neck, arm or facial swelling or distention, or burning along tunnel tract.	• Mechanical occlusions cannot be corrected with Cathflo® (Alteplase).
5. Consider obtaining an order for verification of catheter tip placement via x-ray, especially if the patient experiences symptoms such as shoulder, neck or jaw pain, or if they complain of a “whooshing” sound in their ear while the CVAD is in use.	• Chemical occlusions cannot be corrected with Cathflo® (Alteplase).
6. For Implanted Ports consider re-accessing the port with a new needle then reassess patency.	• Pharmacy should be consulted for suspected chemical occlusions as there may be treatments that can be ordered to restore patency.
7. If all other causes of occlusion have been ruled out, and there are no known contraindications, obtain a physician’s order for Cathflo® (Alteplase).	• Thrombotic occlusions outside of the catheter lumen will not be corrected with Cathflo® (Alteplase), as the medication is instilled within the line, not into the bloodstream.
	• Inability to aspirate blood is one sign of catheter malposition.

Procedure for preparing solution

1. Aseptically withdraw 2.2mL of Sterile Water for injection into a 10 mL syringe (Do Not use Bacteriostatic Water). 2. Inject the 2.2mL of Sterile Water for injection into the Cathflo® (Alteplase) vial, directing the diluent stream into the powder. Slight foaming is not unusual. Let the vial stand undisturbed to allow bubbles to dissipate. 3. Mix by gently swirling until contents are completely dissolved. Complete dissolution should occur within 3 minutes. DO NOT SHAKE. The reconstituted preparation results in a colourless to pale yellow transparent solution. **Note:** • Standard Cathflo® (Alteplase) dosage is 2mg per lumen for patient weight greater than 30kg. • For patient weight less than 30kg, standard dosage is 110% of the catheter lumens' fill volume/priming volume (not to exceed 2mg). • Maximum total dose should not exceed 4mg (i.e. 2 doses/attempts with 2mg each attempt).	• Using a smaller syringe to administer Cathflo® (Alteplase) may cause the catheter to rupture due to increased pressure. • Shaking the vial may result in bubbles in the solution.
Procedure for administration in a PARTIALLY occluded catheter	
Note: Elsevier provides instruction for the technique of instilling Cathflo® (Alteplase) for **partial** occlusions. Elsevier: Central Venous Catheter: Declotting with Anteplase Continue reading below for the procedure for **complete** occlusions.	
Procedure for administration in a COMPLETELY occluded catheter	
Procedure	**Rationale**
<u>Single syringe negative pressure method</u> 1. Withdraw 2 mL (2 mg) of reconstituted Cathflo® (Alteplase) solution from the vial into a 10 mL syringe. Affix a completed Medication Label to the syringe. 2. If the CVAD has more than one lumen: • Unless contraindicated, stop infusions that are infusing through the other lumens until Cathflo® (Alteplase) instillation procedure is complete. • If both lumens are completed occluded, one dose of Cathflo® (Alteplase) may be instilled into each lumen. 3. Clamp catheter lumen (if catheter has a clamp) and remove the Microclave Clear cap from the occluded catheter lumen. 4. Scrub the open lumen with 2% chlorhexidine/70% alcohol, using vigorous friction for 15 seconds. Allow to air dry completely. 5. Attach the 10 mL syringe containing the Cathflo® (Alteplase) solution to the occluded catheter, holding the syringe vertically with the plunger end up. 6. Gently pull back on the plunger and hold it to create negative pressure (Figure 1.) 7. Slowly release the plunger and the negative pressure on the syringe. 8. Repeat steps 6 & 7 every 10 to15 minutes for <u>up to 120 minutes</u> or less if	• To increase the chance of the Cathflo® (Alteplase) solution coming into contact with a clot at the end of the catheter • To decrease the risk of air embolism • To decrease the amount of "dead space" in between the clot and the Cathflo® (Alteplase) solution • To allow the Cathflo® (Alteplase) solution to be introduced into the catheter and prevent air from being introduced into the catheter. • This will allow the Cathflo® (Alteplase) to be drawn into the catheter and come in contact with the clot formation. • This will allow the Cathflo® (Alteplase) to be pulled into the catheter as the clot dissolves. • Complete occlusions may take the entire 120 minutes to resolve or may require a second dose of Cathflo® (Alteplase). • If an x-ray for catheter tip placement was not performed, and the Cathflo® (Alteplase) was not effective in restoring patency, consider obtaining an order for x-ray confirmation of tip placement now. • An unresolved occlusion is a potential source of infection. • To increase the chance of the Cathflo® (Alteplase) solution coming into contact with a clot at the end of the catheter. • To decrease the risk of air embolism.

catheter function is restored. **Note:** If leaving the bedside in between attempts, leave the syringe connected to the catheter. Tape the syringe securely to the patient's arm and label catheter "Cathflo instilled, DO NOT USE". Inform the primary nurse (if applicable) that the line should not be used until the procedure is complete and patency has been restored. 9. Once blood return is easily obtained, aspirate 5mL of blood to remove Cathflo® (Alteplase) and the residual clot from the line. Attach a new primed end cap to the catheter, and flush per hospital policy using prefilled 10 mL 0.9% Sodium Chloride syringes 10. If blood return is not obtained or is sluggish after a total of 120 minutes of dwell time a second dose of Cathflo® (Alteplase) may be instilled repeating steps 1-9. **Note:** If after the second dose catheter function is not regained, label line "Blocked- DO NOT USE" and notify the physician. **<u>Stop-cock negative pressure method</u>** 1. Withdraw 2 mL (2 mg) of reconstituted Cathflo® (Alteplase) solution from the vial into a 10 mL syringe. Affix a completed Medication Label to the syringe. 2. If the CVAD has more than one lumen: • Unless contraindicated, stop infusions that are infusing through the other lumens until Cathflo® (Alteplase) instillation procedure is complete. • If both lumens are completed occluded, one dose of Cathflo® (Alteplase) may be instilled into each lumen. 3. Clamp the catheter lumen (if catheter has a clamp) and remove the cap from the occluded catheter lumen. 4. Scrub the open lumen with 2% chlorhexidine/70% alcohol, using vigorous friction for 15 seconds. Allow to air dry completely. 5. Attach the syringe containing the Cathflo® (Alteplase) solution to the side port of the stop-cock, and attach an empty 10 mL syringe to the end port of the stop-cock (Figure 2). 6. Turn the stop-cock off to the end port containing the empty syringe and prime the stop-cock with the Cathflo® (Alteplase) solution. 7. Connect the stop-cock, with both syringes still in place, to the occluded catheter lumen (see Figure 2.) 8. To attempt to instill the Cathflo® (Alteplase) solution into the completely occluded catheter lumen, turn the stop-cock off to the port containing the Cathflo® (Alteplase) syringe and pull back gently on the plunger of the empty 10 mL syringe in order to create negative pressure. 9. While maintaining this negative pressure on the syringe plunger, turn the stop-cock off to this empty syringe. A very small amount of Cathflo® (Alteplase) should have been introduced into the catheter lumen (you may even see the Cathflo® (alteplase) solution "jump' as this occurs). 10. Repeat steps 8 & 9 every 10 to 15 minutes for <u>up to 120 minutes</u> or less if catheter function is restored. **Note:** If leaving the bedside in between attempts, leave the entire system	· The cap is removed to decrease the amount of "dead space" in between the clot and the Cathflo® (Alteplase) solution • Complete occlusions may take the entire 120 minutes to resolve or may require a second dose of Cathflo® (Alteplase). • If an x-ray for catheter tip placement was not performed, and the Cathflo® (Alteplase) was not effective in restoring patency, consider obtaining an order for x-ray confirmation of tip placement now. • An unresolved occlusion is a potential source of infection.

connected to the catheter. Tape the syringe securely to the patient's arm and label catheter with completed medication label: "Cathflo instilled, DO NOT USE". Inform the primary nurse (if applicable) that the line should not be used until the procedure is complete and patency has been restored.

11. Once blood return is easily obtained, aspirate 5mL of blood to remove Cathflo® (Alteplase) and the residual clot from the line. Attach a new primed end cap to the catheter, and flush per hospital policy using prefilled 10 mL 0.9% Sodium Chloride syringes

12. If blood return is not obtained or is sluggish after a total of 120 minutes of dwell time, a second dose of Cathflo® (Alteplase) may be instilled repeating steps 1-10.

Note: If after the second dose catheter function is not regained, label line "Blocked- DO NOT USE" and notify the physician.

Documentation should include:

- Initial assessment of catheter function.
- Physician order for Cathflo® (Alteplase) for CVAD patency.
- Identification of occluded catheter/lumens.
- Cathflo® (Alteplase) dosage/volume used, dwell time and number of attempts.
- Outcome of procedure and follow up interventions required.
- Recommendations for any required change in plan of care related to maintaining catheter patency.
- Patient education.
- Communication with physician and the patient's primary nurse (if applicable).

Related Documents and references:

HPHA Clinical Policy and Procedures:

- Central Venous Access Devices- PICC line
- Central Venous Access Devices- Non-Tunneled
- Central Venous Access Devices- Tunneled
- Central Venous Access Devices- Implanted Ports
- Central Venous Access Devices- Troubleshooting

Drug Product Monograph included with Cathflo® (Alteplase) vial

Cathflo® (alteplase) Order set (forms on-line)

Elsevier: Central Venous Catheter: Declotting with Alteplase

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