

Hemodialysis: Alteplase (t-PA) Instillation into Blocked Central Venous Catheter

Site Applicability

SPH In-center hemodialysis unit and PHC community dialysis units

Practice Level

Nurses who have completed the required education and who provide care in PHC Renal Program - hemodialysis specialty perform this procedure

Requirements

Alteplase (t-PA, Cathflo) Order

1. Thrombolytic are initiated only after all other possibilities for poor blood flow have been explored and attempts to resolve the problem (i.e. repositioning patient, flushing catheter, etc.) have been made.
2. Obtain Prescriber's Orders – alteplase (t-PA, CATHFLO) for Occluded Hemodialysis Catheter from Cerner Powerplans

Need to Know

1. Blocked or dysfunctional central venous catheters are identified by: difficult instilling or aspirating catheter lumens and/or a decrease in blood flow of less than 300 mL/min during hemodialysis.
2. Hemodialysis catheter lumens range in volume. The volume of each lumen is clearly marked on the catheter above the Y on each lumen clamp.
3. Alteplase is a thrombolytic agent that works by binding to fibrin in a thrombus, then converting the entrapped plasminogen to plasmin resulting in local fibrinolysis (i.e. digests fibrin and dissolves blood clot).
4. Alteplase vials need to be protected from light and kept in their original box until needed.
Alteplase vials do not contain antibacterial preservatives and should be stored in a refrigerator at a temperature between 2 and 8 degrees C and reconstituted **immediately** before use. The **solution** must be used within 8 hours following reconstitution when stored between 2 and 30 degrees C.

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5. A single dose **Sterile Water for Injection vial** must be used to reconstitute Alteplase. Mix gently with a swirling motion. **Do not** shake the vial to dissolve.
6. Alteplase should not be administered to patients with known hypersensitivity to Alteplase.
7. A physician's order is required for alteplase administration.
8. Alteplase may be instilled pre or post dialysis.
9. Locking solutions must be aspirated or flushed from the catheter lumens prior to alteplase administration.
10. Common sites of thrombus formation: catheter lumen, site where catheter enters the vein, catheter tip, and along the external surface of the catheter.

Equipment and Supplies

For All Instillation Methods

1. Sterile On or Off tray
2. Chlorhexidine 2% with 70% Isopropyl alcohol (CHG) swabs
3. Alcohol swabs
4. 3 mL syringes
5. Sterile Gloves
6. Masks
7. Gown, and goggles/face shield
8. Alteplase 2 mg. (1 to 2 vials)
9. Sterile Water for Injection
10. 18 g needles

Push/Pause Method

1. 3 mL syringe with sterile Normal Saline (NS) **without preservative** (2 to 4)
2. 3 mL syringes (3)
3. 10 mL syringes (2)
4. 20 mL syringes with sterile NS **without preservative** (2)

Dwell Method

1. 3 mL syringe with sterile NS **without preservative** (2)
2. 10 mL syringes (2)
3. 20 mL syringes with sterile NS **without preservative** (2)
4. Medication labels

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Procedures

Push-Pause Method

STEPS	RATIONALE
1. Following the procedure for initiating hemodialysis using a central venous catheter with and without TEGO connectors, forcefully flush with “push/pause” method each lumen (i.e. short repetitive pushes on the syringe plunger) with 20 mL of NS using aseptic technique	To ensure catheter is thoroughly cleared of blood and heparin. “Push/pause” flush technique increases the turbulence within the catheter lumen during the flush, thereby making the flush more effective
2. If flush successful, attempt to aspirate blood for 2 to 3 times more and forcefully flush with push/pause technique	
3. If flush unsuccessful, repeat step 1.	
4. <i>If still unsuccessful, notify MD of catheter dysfunction and process order for Alteplase.</i> <ol style="list-style-type: none"> Verify physician’s powerplan order in Cerner regarding alteplase Reconstitute alteplase using sterile water for injection and product monograph 	6D – complete & leave physician’s powerplan order in Cerner. CDU – Fax copy of order to Vascular Access Nurse at SPH Reconstitution with Bacterio-static water is not recommended.
5. Using aseptic technique, ensure both catheter lumens are clamped. Detach syringe from arterial lumen, attach alteplase syringe, open clamp and gently inject alteplase. Clamp lumen.	
6. Detach alteplase syringe and attach 3 mL NS syringe. Open clamp and inject NS to fill volume of lumen plus 0.3 mL overfill . Clamp lumen.	Example: Lumen volume = 1.3 mL, inject 1 mL of Alteplase plus 0.6 mL of NS
7. Repeat steps 5 and 6 using venous lumen	
8. Wait 10 minutes, and then gently push NS 0.3 mL for large volume catheters, and 0.2 mL for low volume catheters (1.5 mL or less), into each lumen. Clamp lumens	
9. Wait another 10 minutes, then repeat step 8.	
10. Wait another 10 minutes. Remove 3 mL syringe from arterial lumen and attach 10 mL syringe. Aspirate any residual alteplase or clots. Clamp lumen	

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11. Repeat aspiration of alteplase as above using venous lumen. Clamp lumen.	
12. Remove 10 mL syringe from arterial lumen and attach 20 mL syringe with NS. Flush with “push/pause” method. Clamp lumen	
13. Repeat step 12 using venous lumen. Clamp lumen	
14. Initiate dialysis following the procedure for initiating dialysis using a central venous catheter.	

Short Dwell Method

1. Follow steps 1 through 7 of Push/Pause method	
2. Wait 60 minutes, remove 3 mL syringe from arterial lumen and attach 10 mL syringe. Aspirate any residual alteplase or clots. Clamp lumen	
3. Repeat aspiration of alteplase as above using venous lumen. Clamp lumen.	
4. Remove 10 mL syringe from arterial lumen and using 20 mL syringe with NS, forcefully flush lumen. Clamp lumen	
5. Repeat step 4 using venous lumen. Clamp lumen	
6. Initiate dialysis following procedure for initiating dialysis using a central venous catheter with and without TEGO connectors	

Overnight Dwell Method

1. Using aseptic technique discontinue dialysis following procedure for discontinuing dialysis using a central venous catheter with and without TEGO connectors. Clamp lumens.	
2. Attach 20 mL syringe with NS to arterial lumen. Flush using the “push/pause” method. Clamp lumen.	To increase turbulence within the catheter lumen and to ensure catheter is thoroughly cleared of blood
3. Repeat step 2 using venous lumen. Clamp lumen.	

4. Detach 20 mL syringe from arterial lumen, attach alteplase syringe, open clamp and gently inject alteplase. Clamp lumen.	
5. Detach alteplase syringe and attach 3 mL NS syringe. Open clamp and inject NS to fill volume plus 0.3 mL overfill . Clamp lumen.	Example: Lumen volume = 1.3 mL; inject 1 mL of Alteplase plus 0.6 mL of NS
6. Repeat steps 4 and 5 using venous lumen	
7. Remove syringe from arterial lumen and discard	
8. Remove syringe from venous lumen and discard	
9. Wrap catheter lumens together with 4 x 4 gauze and secure with tape. Attach alteplase label to venous and arterial lumens	Promotes patient comfort Label will alert medical or nursing personnel that the catheter contains alteplase
10. Leave alteplase in situ into both arterial and venous lumens until next dialysis treatment schedule	The duration of the anticoagulation therapy may enhance the effect of the alteplase
11. Connect arterial and venous blood lines to female ports on the extracorporeal circuit	To prevent blood/fluids from leaking out the open ends of the lines

Documentation

1. Pre, intra, and post assessments of patient and catheter function at CST Cerner Nursing Narrative
2. Notes and at iView Dialysis management Intra-procedure of Central Line
3. Dialysis management, Central Line iView – volume of locking agent instilled
4. Situation & Awareness/Action/Planning (Team communication-Discoverable)
5. Interventions: MD notification, additional monitoring and procedures performed.
6. Alteplase dose instilled on the Cerner medication administration record/HD monthly medication record
7. Document Alteplase dose on the TPA record binder for tracking.

Patient and Family Education

1. Instruct patient to observe and report any signs of bleeding, bruising, urticaria after Alteplase instillation.
2. Instruct patient to inform hemodialysis nurse at beginning of next hemodialysis treatment that they have received alteplase during the previous hemodialysis treatment.

Related Documents

1. [B-00-12-10052](#) – Hemodialysis: Accessing a Central Venous Catheter (CVC) with and without TEGO Connectors
2. [B-00-12-10043](#) – Hemodialysis: Central Venous Access Dressing
3. [B-00-12-10144](#) – Hemodialysis: Flushing Central Venous Catheters
4. [B-00-12-10145](#) – Hemodialysis: Alteplase (t-PA) Infusion during Hemodialysis
5. [B-00-07-13045](#) – Standard Precautions (Infection Control)
6. [B-00-07-13027](#) - Face Protection: Goggles and Face Shields (Infection Control)
7. [B-00-07-13026](#) – Gloves (Infection Control)
8. [B-00-07-13033](#) - Gowns, and Protective Apparel (Infection Control)
9. [PDTM](#) – Parenteral Drug Therapy Manual
10. [Occupational Health and Safety – Cytotoxic /Hazardous Drugs](#)

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