TITLE: Catheter Clearance for Venous Access Devices in the Home

DEFINITIONS:

1. VAD: Venous Access Device inclusive of and limited to the following catheter types: peripherally inserted central catheters (PICCs), ports, tunneled central catheters, split-valve central catheters.

2. Partially Occluded VAD: A VAD can be flushed and not aspirated or if it can be flushed only with resistance.

3. Complete Occlusion: VAD cannot be flushed.

4. Alteplase: Tissue plasminogen activator (Alteplase) is an enzyme that binds to fibrin in a thrombus and converts the entrapped plasminogen to plasmin, thereby initiating local fibrinolysis.

PROCEDURES:

A. Assessment, patient will be assessed on an individual basis by a registered nurse or pharmacist and identified as appropriate to receive Alteplase in the home for resolution of partial or complete catheter occlusion (Exhibit 1: Assessment data requisite of review is inclusive of but not limited to: reasons leading to occlusion, the estimated duration of time the occlusion has existed, patient risk assessment for post procedural bleeding and other documented side effects, allergy history and a medication profile review. Assessment data will be used to substantiate the presence of a fibrin sheath / clot and to rule out the likelihood that a mechanical kink or drug precipitate is the cause of an occlusion. All lumens of the VAD should be treated with Alteplase even if functioning.

B. Exclusion criteria, Patients will be ineligible to receive Alteplase in the home if any of the following are true:
   1. History of hypersensitivity to Alteplase or any components of the formulation.
   2. Weight less than 30 kg.

C. Potential Exclusion Criteria, patients may be ineligible to receive Alteplase in the home if any of the following are true:
   1. Any surgery or obstetrical delivery within the past 10 days, intraspinal surgery within the past 60 days.
   2. Cerebral vascular disease or history of intracranial neoplasm, arteriovenous malformation, or aneurysm.
   3. History of or active gastrointestinal, genitourinary, menstrual or other bleeding.
   4. Physical trauma within the past 10 days.
   5. Uncontrolled or untreated hypertension defined as a systolic blood pressure greater than 180 mmHg or a diastolic blood pressure greater than 110 mmHg.
   6. Active infection.
   7. Suspected catheter infection or currently being treated for catheter infection.
   8. Age greater than 75 years, or less than 2 years.
   9. Diagnosis of a coagulation disorder or concurrent anticoagulant therapy.
   10. History of or active thrombocytopenia.
   11. Diagnosis of hepatic or renal disease.
D. Home Infusion Nursing Administration of Alteplase
   1. Obtain / review physician order, identify patient using 2 identifiers, and explain procedure.
   2. Inspect drug label, solution and equipment / supplies. Validate all items are usable.
   3. Wash hands.
   4. Prepare a clean work surface.
   5. Follow step-by-step guidelines (Exhibit 2) for use of intravenous Alteplase for catheter clearance.

E. Monitoring. A licensed nurse will monitor the patient post instillation of Alteplase for a minimum duration:
   1. Not less than 30 minutes after the occlusion has been resolved or
   2. Not less than 30 minutes after unsuccessful resolution of the occlusion following the second dose.

F. Documentation
   1. The nurse will chart response to therapy in visit note.

G. Patient/Caregiver Education
   1. Review flushing technique and frequency of flushing
   2. Review medication administration and blood drawing technique.
   3. On-going therapy provision and care coordination will occur as indicated in the plan of care.

EXHIBITS:
   1. HomeMed Catheter Clearance Staff Reference.
   2. HomeMed Guidelines for use of intravenous Alteplase for catheter clearance

UMHHC/HCS REFERENCES:

APPROVAL AND REVISIONS:
   1. August 2007, new procedure.
   2. January 2013, removal of 3 exhibits (drug information, supply list, and clearance note) due to electronic databases processes and existing policies and procedures.
   3. January 2016, reviewed and removed references to blunt cannulas.
HOME CATHETER CLEARANCE STAFF REFERENCE

Alteplase therapy is used to treat nonfunctioning or sluggish IV catheters due to a thrombus occlusion.

Box 1: Alteplase May Be Indicated
Box 2: Alteplase Not Indicated

I. Mechanical Interventions To Restore IV Access Function

- IV access is kinked underneath or beyond dressing
- IV tubing is kinked or a clamp closed
- Adequate distance not present from IV bag to IV site to allow gravity to infuse medication
- IV access flushes without resistance
- IV access function restored after changing IV tubing and filter, if present
- IV access function restored after patient asked to change positions and/or lift arms overhead or forward to “lift the clavicle off the subclavian vein” (Notify MD as xray may be indicated.)
- IV access function restored after asking the patient to take a deep breath and cough forcefully and then CG or VN attempt to irrigate and/or withdraw blood
- IV access function restored if patient has an implanted port, by deaccessing and reaccessing with a new bent needle (Ensures correct needle placement or rules out a possible defect in the bent needle itself.)
- No mechanical reason for occlusion, however, IV access flushes with resistance

Continue to Step II for further evaluation.

II. Troubleshooting Thrombosis or Precipitate as a Cause for Obstruction or Inability to Withdraw Blood

Specimen

- Pt reporting pain in neck, chest or shoulder on the same side as IV access located
- Pt experiencing edema in arm, neck, face, chest or shoulder on same side as IV catheter located
- New onset of superficial, collateral veins

Contact MD if any of the above 3 boxes checked

- Medication was infused without using flush protocol (possible precipitate?)
- Lab draw within 48 hours or less as likelihood of thrombus within VAD is increased
- Infusion pump alarming occlusion without mechanical reason and IV access flushing with resistance
- Pt not using positive-pressure technique when flushing IV access

Continue to Steps III and IV if no suspected thrombotic reason for obstruction.

III. Absolute Exclusion Criteria for the Use of Alteplase (see Rx for eligible IV access)

- History of hypersensitivity to Alteplase or any components of the formulation
- Weight less than 30 kg
- Pregnancy

IV. Criteria which May Exclude the Use of Alteplase

- Any surgery or obstetrical delivery within the past 10 days; intraspinal surgery within the past 60 days
- Cerebral vascular disease or history of intracranial neoplasm, arteriovenous malformation, or aneurysm
- History of, or active gastrointestinal, genitourinary, or other bleeding, or active menstrual bleeding
- Physical trauma within the past 10 days
- Uncontrolled or untreated hypertension defined as a systolic blood pressure greater than 180 mmHg or a diastolic blood pressure greater than 110 mmHg
- Suspected catheter infection or currently being treated for catheter infection
- Age greater than 75 years or less than 2 years
- Concurrent anticoagulant therapy
- History of or active thrombocytopenia
- Diagnosis of hepatic or renal failure
- Diagnosis of coagulation disorder

Continue to Step IV if patient assessed to need Alteplase treatment and free of above exclusion criteria in sections III & IV.

V. VNA Availability to Administer Alteplase

- Patient currently has VNA assistance
- VNA has a policy to administer Alteplase
- VNA able to make patient visit within next 24 hours
- HomeMed able to delivery Alteplase prior to VNA home visit
GUIDELINES FOR USE OF IV ALTEPLASE FOR CATHETER CLEARANCE

Alteplase (Cathflo®) therapy is used to treat nonfunctioning or sluggish central VADs with thrombus occlusion. Two milligrams of Alteplase in 2 mL sterile water for injection is administered in occluded lumens of central VADs. The dose is allowed to dwell for up to 120 minutes; after which time, if the function of the lumen is not restored, the dose may be repeated one time. This is a standard dose for all patients equal to or greater than 30 kg body weight.

PROCEDURE:
1. Rule out VAD occlusion due to mechanical problem.
2. Assess VAD and the ability to withdraw blood or infuse fluid using a 10mL syringe. If sluggish flow or unable to withdraw blood or infuse through the VAD, suspect thrombotic occlusion. **Never push past resistance.**
   a. If able to flush and aspirate without any difficulties, stop and call a HomeMed clinician to report that Alteplase therapy is not needed at this time.
3. Gather supplies, including anaphylaxis kit (if patient's first dose)
4. Use aseptic technique to compound Alteplase to a final concentration of 1 mg/mL. (see a-c)
   a. Withdraw 2.2 mL of sterile water for injection using a 5 mL syringe. **DO NOT USE Bacteriostatic Water for injection.**
   b. Inject the 2.2 mL of sterile water into the Alteplase vial, directing the stream into the powder. If slight foaming occurs, let the vial stand undisturbed to allow large bubbles to dissipate.
   c. Swirl vial gently until contents are completely dissolved. **Do not shake.** Reconstituted solution should be colorless or pale yellow and transparent. **Note:** Alteplase should be used within 8 hours of preparation. **Discard unused solution.**
5. Withdraw 2 mL of compounded Alteplase using a 10 mL syringe.
6. Administration technique: Aseptically remove any extension tubing or end cap from the central line, attach the stopcock directly to the VAD, turned off to the VAD
7. Attach an empty 10 mL syringe to one opening of the stopcock and the 10 mL syringe filled with Alteplase to the other open end of the stopcock.
8. Turn the stopcock off to the Alteplase syringe and open to the 10 mL empty syringe.
9. Gently aspirate into empty syringe:
   a. If easy fluid return occurs, you will not be able to use a negative pressure technique. (Skip to step 10a).
   b. If limited or no fluid return occurs, aspirate until the plunger of the empty syringe is approximately at the 7-10 mL mark with air. (This will allow for aspiration of any contents that may be between the occlusion and the VAD hub. Skip to step 10b)
10. Alteplase administration:
    a. Turn stopcock open to the Alteplase syringe and push plunger to insert drug into catheter. (Skip to step 11).
    b. While holding the empty syringe at approximately the 7-10 mL mark, turn the stopcock off to the aspirated syringe and open to the Alteplase syringe (Alteplase should automatically be drawn into the VAD).
11. Turn the stopcock off to the access device, allow Alteplase to remain in the VAD for 30 minutes.
12. After 30 minutes of dwell time, attempt aspiration by opening the stopcock to VAD and empty syringe. Aspirate empty syringe and hold to create negative pressure. If no blood return, turn the stopcock off to the VAD and allow Alteplase to remain in place for 30 minutes. Repeat aspiration attempt. If aspiration attempt is unsuccessful, a second dose of Alteplase should be administered. (Repeat steps 4-12)
13. Aspirate 4-5 mL of blood to assure complete removal of all drug and residual clot. Patency is restored when 4-5 mL of blood is easily aspirated.
14. Remove the stopcock. Aseptically replace any extension tubing or end cap to the VAD.
15. Thoroughly pulse flush the VAD with 10-20 mL of normal saline by push/pause method and follow with heparin per VAD specific orders.
16. **Note:** Pt must be monitored for a minimum of 30 minutes after completion of procedure.
17. Notify HomeMed clinician of outcome of nursing visit with phone call to branch team.
18. **Note:** Second dose should remain in the home if unused.