

	<p>POLICIES &amp; PROCEDURES</p> <p><b>RNSP (Advanced RN Intervention)</b></p> <p>Title: Alteplase (Cathflo) Instillation for Restoration of Patency in Central Venous Access Devices</p> <p>I.D. Number: <b>1049</b></p>
<p>Authorization:</p> <p><input checked="" type="checkbox"/> SHR Nursing Practice Committee</p>	<p>Source: Nursing</p> <p>Date Effective: September, 2016</p> <p>Scope: <b>SHR SPH – Medical Imaging and ICU RUH – 6100 and ICU HDH – COPS</b></p>

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**Definitions:**

**Alteplase:** a fibrinolytic medication used to lysis thrombotic PICCs, brand name Cathflo

**Catheter Obstruction Dysfunction:** impeded flow and/or inability to infuse, and/or withdraw from a catheter

**CVAD:** Central Venous Access Device and refers to all central venous catheters including: short term Central venous catheters, PICC's, tunneled catheters, implanted ports and hemodialysis catheters\*

**Note:** \*The certification to administer Alteplase through a hemodialysis catheter will include Hemodialysis and Continuous Renal Replacement therapy (CRRT) nurses only

**PICCs:** Peripherally Inserted Central Catheters

**CNE:** Clinical Nurse Educator

**MRP:** Most Responsible Physician

**MI:** Medical Imaging

**Roles:**

**Registered Nurses (RNs)** - RNs identified by the manager in targeted practice settings, will be certified in this RN Specialty Practice, Advanced RN Intervention of Alteplase (Cathflo) Instillation for Restoration of Patency in Central Venous Access Devices

**1. PURPOSE**

1.1. To provide standard and safe instillation of Alteplase.

**2. POLICY**

2.1 The RN certified in this RNSP will have first completed the following learning modules/activities prior to instilling Alteplase independently:

- Attended an educational session on Alteplase instillation,
- Completed the learning package and quiz and returned it to the CNE
- Complete skills checklist with a certified RN during first instillation, to validate and ensure safety checks are followed appropriately.

- 2.2 The MRP or designate will write an order for Alteplase including dose when it is deemed appropriate to restore patency in an obstructed or dysfunctional PICCs. The usual dose is 2 mg / lumen. The recommended dwell time is 60 – 120 minutes.

### 3. PROCEDURE

- 3.1 Confirm patient identity.
- 3.2 Establish that the patient does not have a hypersensitivity to Alteplase or any components. If known risk of bleeding, contact MRP or designate.
- 3.3 Evaluate the patency of the catheter to rule out other potential causes of occlusion:

Mechanical obstruction – clamped/kinked tubing, malposition, suture too tight, migration of tip. Having the patient take deep breaths, cough, raise and lower arms, or change position may resolve a mechanical obstruction. If able to infuse but not draw blood, flush the line rapidly using the start-stop method with Normal Saline in a 12 ml syringe, then re-attempt with aspiration. Removing needleless adaptor and flushing directly into line can also be attempted. Replace with new adaptor.

Chemical obstruction – drug interaction (Pharmacy may be able to identify, if occlusion is acid or alkaline), or lipid aggregation. Lipid aggregation may be a contraindication for Alteplase.

Thrombotic obstruction – observe head, neck and thorax for signs and symptoms of venous thrombosis or superior vena cava syndrome (e.g. swelling of face, neck and arms) and distension of collateral circulation of the chest. Venous Doppler or flow studies may be indicated.

**Note:** *The MRP should consider whether the CVAD may be discontinued due to a change in patient's condition or change in treatment such as venous access now available, patient no longer requiring long-term antibiotics.*

- 3.3.1 Document assessment and recommendations in the progress notes.
- 3.4 Ensure order for Alteplase is on the physician order.
- 3.5 Partially Occluded CVAD:
- 3.5.1 Gather supplies
- Gloves
  - Sterile gauze pad
  - Alcohol swabs
  - Medication label or Alteplase label
  - Alteplase supplied by pharmacy. This is to be stored in medication fridge and used immediately once taken out
  - Preservative free sterile water (10ml vial)
  - 12ml syringe with 18gauge blunt needle
  - Needleless adaptor
  - 2 x 12ml prefilled 0.9% sodium chloride syringes (minimum)
- 3.5.2 Explain procedure to patient.
- 3.5.3 Perform hand hygiene.

3.5.4 Don gloves.

3.5.5 Reconstitute Alteplase.

**Note:** *Alteplase will be supplied as a 2mg vial in powder form.*

3.5.5.1 Inject 2.2 ml of sterile water into vial

3.5.5.2 Mix by gently swirling until the contents are completely dissolved.

3.5.5.3 Label syringe with medication label indicating 1mg/ml.

**Note:** *The solution will appear as a colorless to pale yellow transparent solution and will contain 1mg/ml of Alteplase. The solution must be used within 8 hours of reconstitution.*

3.5.6 Remove microclave or needleless adaptor. Clean CVAD hub for 15 seconds using an alcohol swab and friction. Allow to dry.

3.5.7 Attach syringe containing reconstituted Alteplase.

3.5.8 Instill Alteplase solution slowly. Leave empty labeled syringe attached.

3.5.9 Let the Alteplase dwell for 60 minutes

3.5.10 Withdraw 4-5mls of blood into the attached syringe and discard aspirate

3.5.11 If patency is restored, attach a new needleless adaptor and flush lumen with at least 20mls of 0.9% sodium chloride, using stop-start method to cause turbulent flow.

3.5.12 If unable to aspirate, leave syringe attached and wait an additional 60 minutes for a total dwell time of 120 minutes

3.5.13 Withdraw 4-5mls of blood into the attached syringe and discard aspirate

3.5.14 If patency is restored, attach a needleless adaptor and flush lumen with at least 20mls of 0.9% sodium chloride, using stop-start method to cause turbulent flow.

3.5.15 If still unable to aspirate after the 120 minutes dwell time, instill second dose of Alteplase and repeat the above procedure noted in 3.5.9-3.5.12

3.5.16 Withdraw 4-5mls of blood,

3.5.17 If patency is restored flush with at least 20mls of 0.9% sodium chloride, using stop-start method to cause turbulent flow and or lock the catheter with 0.9% sodium chloride as appropriate.

3.5.18 If patency not restored after 2 doses of Alteplase consult MRP.

3.5.19 Document time and result of Alteplase administration in progress notes and on MAR. Include number of lumens, number of attempts, and outcome of procedure.

## **Completely Occluded Lumen:**

### 3.6 Push-Pull Method

#### 3.6.1 Gather Supplies

- Gloves
- 1x12ml luer lock syringes
- Alcohol swabs
- Medication label or cathflo label
- Alteplase as supplied by pharmacy
- Microclave end
- 2 x12ml prefilled 0.9% sodium chloride syringe
- Sterile water 10 ml vial

3.6.2 Explain procedure to patient

#### 3.6.3 **Perform hand hygiene**

3.6.4 Reconstitute Alteplase as per directions in 3.5.5

3.6.5 Remove microclave or needleless adaptor. Clean CVAD hub for 15 seconds using an alcohol swab and friction. Allow to dry.

3.6.6 Attach syringe containing reconstituted Alteplase. Tip syringe upward and pull slightly back on the plunger for a few seconds, then try to instill small amount of Alteplase into the lumen. Do not use excessive force. If Alteplase cannot be instilled, repeat the process pulling back slightly on the plunger for a few seconds and then try to instill again. Continue to repeat process using this pull - push strategy until Alteplase is instilled into the lumen. Please note this may take 5 to 15 minutes.

3.6.7 Leave labelled syringe intact at end of line until dwelling time is complete.

3.6.8 Wait 60 minutes and then attempt aspiration of at least 4 – 5 mls of blood and discard aspirate.

3.6.9 If patency is restored, attach a needleless adaptor and flush lumen with at least 20mls of 0.9% sodium chloride, using stop-start method to cause turbulent flow.

3.6.10 If unable to aspirate, leave syringe attached and wait an additional 60 minutes for a total dwell time of 120 minutes

3.6.11 Withdraw 4-5mls of blood

3.6.12 If patency is restored flush as above and reconnect to IV tubing or lock the catheter with 0.9% sodium chloride as appropriate.

3.6.13 If still unable to aspirate after the 120 minutes dwell time, instill second dose of Alteplase and repeat the above procedure noted in 3.6.6-3.6.10

3.6.14 Withdraw 4-5mls of blood.

3.6.15 If patency is restored flush as above and reconnect to IV tubing or lock the catheter with 0.9% sodium chloride as appropriate.

3.6.16 If patency not restored after 2 doses of Alteplase consult MRP.

3.6.17 Document time, result of Alteplase administration in nursing notes and on MAR.  
Include number of lumens, number of attempts, and outcome of procedure.

### 3.7 Stopcock Method:

#### 3.7.1 Gather supplies

- Gloves
- Sterile gauze pad
- 3 x 12ml luer lock syringes
- Alcohol swabs
- Medication label or Alteplase label
- Alteplase as supplied by pharmacy. This is to be stored in medication fridge and used immediately once taken out.
- Male/female luer lock plug
- Needleless adaptor
- 2 x 12ml prefilled 0.9% sodium chloride syringes
- Sterile water-10ml vial
- Sterile 3 way stop cock
- Explain procedure to patient

3.7.2 Perform hand hygiene

3.7.3 Don gloves

3.7.4 Reconstitute Alteplase.

**Note:** *Alteplase will be supplied as a 2mg vial in powder form.*

3.7.4.1 Inject 2.2 ml of sterile water into vial

3.7.4.2 Mix by gently swirling until the contents are completely dissolved.

3.7.4.3 Label syringe with medication label indicating 1 mg/ml.

**Note:** *The solution will appear as a colorless to pale yellow transparent solution and will contain 1mg/ml of Alteplase. The solution must be used within 8 hours of reconstitution.*

3.7.5 Prime 3 way stop cock with 0.9% sodium chloride.

3.7.6 Clean connection between catheter and needleless adaptor for 15 seconds using an alcohol swab and friction in a twisting motion. Allow to dry.

3.7.7 Loosen connection to facilitate rapid change over. If difficult to loosen, use a tourniquet or glove for improved grip.

3.7.8 Disconnect tubing or adapter.

- 3.7.9 Visualize a clock and attach needless adaptors at the 3 and 6 o'clock positions of the 3-way stopcock. (Figure 1)

**Figure 1**



- 3.7.10 Attach the primed 3-way stopcock to the PICC lumen with the turn key pointed "off" towards the lumen (12 o'clock). (Figure 2)

**Figure 2**



- 3.7.11 Attach an empty 10 mL syringe at 6 o'clock. (Figure 3)

**Figure 3**



- 3.7.12 Attach the 10 mL syringe containing the Alteplase at 3 o'clock. (Figure 4)

- 3.7.13 With the turnkey pointed "off" towards 3 o'clock (the Alteplase syringe), pull the empty 10mL syringe plunger back as far as possible, thus creating a negative pressure in the lumen. (Figure 4)

**Figure 4**



3.7.14 While maintaining the negative pressure on the syringe, point the turn key "off" towards the 6 o'clock position. (Figure 5)

**Note:** As the negative pressure resolves the required amount of Alteplase (Cathflo) necessary to reach the clot occlusion will be pulled into the PICC lumen.

**Figure 5**



3.7.15 Point the turnkey "off" to the 12 o'clock position and remove syringes during the dwell time. Note the volume of Alteplase used during the procedure. (Figure 6)

**Figure 6**



3.7.16 After 1 hour dwell time, point the turnkey "off" to the 3 o'clock position, and attempt to aspirate Alteplase using a 10 mL syringe through stopcock at 6 o'clock position.

**Note:** Catheter patency may be evaluated after a 30-minute dwell time, however, the probability of success is increased with longer dwell time.

3.7.17 If blood return is achieved:

- 3.7.17.1 Withdraw the Alteplase and 4-5 mL blood and discard aspirate. Remove stopcock.
- 3.7.17.2 If patency is restored, attach a needleless adaptor and flush lumen with at least 20mls of 0.9% sodium chloride, using stop-start method to cause turbulent flow.
- 3.7.17.3 Reconnect to IV tubing or lock the catheter with 0.9% sodium chloride as appropriate.

3.7.18 If unable to aspirate blood:

- 3.7.18.1 Attempt to flush with 0.9% sodium chloride. Alteplase will be flushed systemically; however, because it has a half-life of less than 5 minutes, the concentration will be very low.
- 3.7.18.2 If unsuccessful, repeat procedure with second instillation of Alteplase, allowing a dwell time of a minimum of 2 hours. After dwell time, reassess catheter function – see 3.6.13 & 3.6.14 above.

3.7.19 If second attempt is unsuccessful, consult physician/NP regarding leaving Alteplase overnight.

- 3.7.19.1 Remove stopcock and attach male/female luer lock plug. Ensure lumen(s) is labeled (Alteplase indwelling catheter – DO NOT USE)
- 3.7.19.2 Assess catheter function the following day. If still unable to aspirate blood, consult physician/NP regarding fluoroscopy and/or possible replacement of catheter.

3.8 Document on the patient's record:

- Alteplase: dose(s) and dwell time
- Number of lumens treated
- Number of attempts
- Outcome of procedure
- Recommendation for any required changes in procedures for maintenance of catheter patency, e.g. flush frequency, use of Alteplase as soon as any signs of sluggish flow.

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