Policy

1. Registered Nurses, Registered Practical Nurses certified by CarePartners in intravenous therapy and clients/caregivers who have received instruction in the specific IV procedure by a nurse and who have demonstrated competence in performing the procedure may flush and lock a peripheral vascular access device (PVAD).

2. For flushing solution and volumes, nurses must follow a physician or RN(EC) order or the CarePartners medical directive for their division (Nursing P&P G-02).

3. All PVADs must be flushed and locked to maintain catheter patency (unless connected to a continuous infusion).

4. Strict aseptic technique must be maintained throughout the flushing procedure.

Background Information

In order to maintain patency of PVADs the correct flushing and locking techniques must be used. Flushing is performed to assess vascular access device function and to prevent the mixing of incompatible solutions; flushing also cleans the catheter and prevents fibrin build up. It must be performed before and after medication administration/ administration of blood components/intermittent therapy and for maintenance of a dormant device. Flushing involves turbulence; this is achieved by using a push-pause or stop start method and should be performed each time the PVAD is flushed with saline. Peripheral vascular access devices are flushed using a 3cc or 10cc syringe. A PVAD should never be forcibly flushed. Excessive pressure exerted when flushing can cause clots to be dislodged, catheter separation and/or catheter rupture.

Locking of the PVAD is performed to maintain device patency and prevent occlusion by instilling solution. Locking of the
PVAD provides positive pressure inside the lumen to help prevent blood reflux from the vein into the catheter therefore preventing the build up fibrin, clots and occlusions.

Locking a PVAD can involve two methods:

1) *Positive pressure locking technique:* This is achieved by maintaining positive pressure on the syringe plunger while closing the clamp on the tubing as you inject the last ml. If no clamp is available, the syringe is removed from the injection cap as you inject the last ml, while maintaining pressure on the plunger.

2) *Positive pressure caps:* These caps function by redirecting a small amount of fluid into the internal catheter tip when the syringe is disconnected from the device hub preventing blood reflux into the lumen. The catheter is not clamped until the flush syringe has been disconnected.

Heparin may be used to lock a PVAD when saline proves ineffective in maintaining patency or based on local protocol. To use heparin, the nurse must have a physician’s order for heparin or a medical directive that includes heparin for locking PVADs.

Flush and lock PVADs according to the following table and before and after each intravenous infusion, and between incompatible medications.

<table>
<thead>
<tr>
<th>Device</th>
<th>Flushing</th>
<th>Locking</th>
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<tbody>
<tr>
<td>PVAD</td>
<td>- Flush intermittent devices with 3-5 ml normal saline or compatible solutions with each use</td>
<td>- Lock PVAD using the last 1-2 ml of normal saline flush solution - Lock the PVAD using twice the</td>
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Section: Intravenous Therapy Procedures
P&P: Peripheral Vascular Access Device – Flushing and Locking

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Procedure</th>
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<tbody>
<tr>
<td>- Flush every 12-24 hours</td>
<td>1) Perform hand hygiene.</td>
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<td>volume capacity of the catheter plus the priming volume or add on devices (i.e. extension tubing-3-10ml)</td>
<td>2) Gather supplies.</td>
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<td>(RNAO, 2008)</td>
<td>3) Cleanse the injection cap of the PVAD with an alcohol swab for 30 seconds. Allow to air dry.</td>
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<td></td>
<td>4) Attach saline filled syringe to injection cap while maintaining sterility.</td>
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<td>- If using a blunt cannula system, insert the blunt cannula into the injection cap.</td>
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<td></td>
<td>- If using a luer lock system, luer lock the syringe onto the injection cap.</td>
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<td></td>
<td>5) Inject 2-3 ml of saline using a push-pause or stop-start technique to create turbulence. Note any resistance or sluggishness of PVAD. Never inject against resistance. PVAD will require further inquiry if unable to flush without resistance.</td>
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<td></td>
<td>6) Administer prescribed therapy or proceed to locking procedure.</td>
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<td>7) Disinfect injection cap with alcohol.</td>
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Equipment
- 3 or 10 cc syringe with 2-3 ml saline (for pre-filled syringes use only between 2-3 ml of saline. Never use the same pre-filled syringe twice – they are intended for single use only.
- Alcohol swab

Procedure
1) Perform hand hygiene.
2) Gather supplies.
3) Cleanse the injection cap of the PVAD with an alcohol swab for 30 seconds. Allow to air dry.
4) Attach saline filled syringe to injection cap while maintaining sterility.
   - If using a blunt cannula system, insert the blunt cannula into the injection cap.
   - If using a luer lock system, luer lock the syringe onto the injection cap.
5) Inject 2-3 ml of saline using a push-pause or stop-start technique to create turbulence. Note any resistance or sluggishness of PVAD. Never inject against resistance. PVAD will require further inquiry if unable to flush without resistance.
6) Administer prescribed therapy or proceed to locking procedure.
7) Disinfect injection cap with alcohol.
8) Attach syringe of locking solution to the injection cap, while maintaining sterility.
9) Slowly inject solution into PVAD.
10) In order to lock the PVAD instill positive pressure into the PVAD:
   - For injection caps that automatically create positive pressure, remove the syringe when the flush is completed and then close the clamp (if present).
   - For negative-pressure injection cap maintain pressure on the syringe plunger while closing the clamp on the extension set, and then disconnect the syringe.
   - For neutral displacement, injection caps can be clamped before or after syringe disconnection.
11) Discard syringe and used supplies in waste receptacle.
12) Perform hand hygiene.