1. **Always verify the patient has a PowerPort® Implantable Port by at least two means.**

   - Check patient chart.
   - Ask your patient.

2. **When in doubt, SCOUT.**

   - For single lumen PowerPort® Implantable Ports: Palpate top of port to identify three palpation bumps on the septum, arranged in a triangle.
   - For dual lumen PowerPort® Implantable Ports: Palpate top of each septum to identify three palpation bumps on the septum, arranged in a triangle.

3. **Lock Procedures for Catheters**

   To help prevent clot formation and catheter blockage, implantable ports with open-ended catheters should be flushed with protamine sulfate using a tamped push-power flushing method after each use. Clamp the tubing while infusing the last 0.5 mL of flush solution to reduce potential for blood back-flow into the catheter tip, which could encourage clotting. If the port remains unused for a long period of time, the 0.5 mL of heparin solution should be changed at least every 24 days for each septum.

   **Recommended Flushing Volumes**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Volume (per lumen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open-Ended Catheter</td>
<td>5 mL heparin flush solution every 24 days.</td>
</tr>
<tr>
<td>After each infusion of medication or TPN</td>
<td>10 mL sterile normal saline, then 5 mL heparin flush solution</td>
</tr>
<tr>
<td>After blood withdrawal</td>
<td>20 mL sterile normal saline, then 5 mL heparin flush solution</td>
</tr>
<tr>
<td>After power injection of contrast media</td>
<td>10 mL sterile normal saline, then 5 mL heparin flush solution</td>
</tr>
</tbody>
</table>

   **Catheter Volumes**

<table>
<thead>
<tr>
<th>Catheter</th>
<th>Volume (per lumen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groshong® Catheter</td>
<td>0.11 mL</td>
</tr>
<tr>
<td>Groshong® Catheter</td>
<td>0.02 mL</td>
</tr>
<tr>
<td>BD Silicone Catheter</td>
<td>0.02 mL</td>
</tr>
<tr>
<td>BD Groshong® Catheter</td>
<td>0.02 mL</td>
</tr>
<tr>
<td>BF Groshong® Catheter (dual lumen)</td>
<td>0.02 mL</td>
</tr>
</tbody>
</table>

   **Reservoir Volumes**

<table>
<thead>
<tr>
<th>Port</th>
<th>Reservoir Volume (per lumen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PowerPort® Implantable Port</td>
<td>0.6 mL</td>
</tr>
<tr>
<td>PowerPort® tP</td>
<td>0.6 mL</td>
</tr>
<tr>
<td>PowerPort® Implantable Port</td>
<td>0.6 mL</td>
</tr>
<tr>
<td>PowerPort® tP Implantable Port</td>
<td>0.6 mL</td>
</tr>
<tr>
<td>PowerPort® Skin Implantable Port</td>
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</tr>
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<td>0.6 mL</td>
</tr>
</tbody>
</table>

4. **Possible Solutions**

   - Reaccess port with longer needle. Needle should be 3/8” or longer.
   - If no resistance to infusion is felt, attempt to flush with 10 mL normal saline. Then pull back gently on syringe plunger 2-3 mL, pause and proceed with aspiration.
   - If resistance to infusion is felt, check for signs of extravasation. If present, notify physician of possible catheter leakage or transaction and embolization. If not present, see step 4.
   - Attempt to aspirate with a 10 mL syringe (creates a greater vacuum).
   - Move patient's arm, shoulder and head to see if a change in position will allow aspiration. If aspiration can only be accomplished with the patient in a certain position, the physician should be examined to see if the catheter has been placed in the "pinch-off" area. See step 6.
   - Obtain physician's order for a chest X-ray to determine the position of the catheter.
   - If the catheter tip is not in the superior vena cava, the catheter should be repositioned.

5. **Troubleshooting Guide**

   **Caution:** Remember that some patients may be hypersensitive to heparin or suffer from heparin induced thrombocytopenia (HIT) and these patients must not have their port locked with heparin flush solution.

   **Possible Causes**

   - Needle not appropriate length. Needle fails to reach bottom of port reservoir.
   - Lack of flow adequately, resulting in lumen obstruction.
   - Catheter tip facing up to vein wall with aspiration.
   - Blood, fibrin, protein, or particulate matter obstructing lumen when catheter is aspirated.
   - Compression or obstruction of the catheter between the clavicle and first rib ("pinch-off area").
   - Misposition of catheter tip (i.e. jugular vein, outside of vein).
   - Improper lumen selection for patient's port.

6. **Accessing Implantable Ports**

   - Perform aseptic site preparation.
   - Locate port site by palpation:
     - Locate base of patient's non-dominant hand.
     - Triangular port between thumb and first two fingers of non-dominant. Aim for center point of these three fingers.
   - For dual lumen PowerPort® Implantable Ports: Locate center by palpating Superior Femoral® Ridge on top of port and place index finger of dominant hand to mark.
   - Insert PowerLoc® Safety Infusion Set device perpendicular to port septum. Advance needle through the skin and port septum until reaching bottom of reservoir.
   - Confirm correct positioning of the needle within the port reservoir by aspiration of blood ("Flashback"). If there is doubt regarding proper needle placement, please contact a radiographic dye procedure done to confirm placement.
   - Always flush the port following injection.
   - Perform heparin lock procedure for open-ended catheters. See Caution 1.

7. **Use and Maintenance**

   - Perform heparin lock procedure for open-ended catheters.
   - For implantable ports with Groshong® Catheters: A sterile normal saline lock may be used.
   - For dual lumen PowerPort® Implantable Ports: Perform locking procedures on each septum.
   - After therapy completion, flush port per institutional protocol. Close clamp while injecting the last 0.5 mL of flush solution. Use positive pressure technique.

8. **Procedure:**

   1. Reaccess port with longer needle. Needle should be 3/8” or longer.
   2. If no resistance to infusion is felt, attempt to flush with 10 mL normal saline. Then pull back gently on syringe plunger 2-3 mL, pause and proceed with aspiration.
   3. If resistance to infusion is felt, check for signs of extravasation. If present, notify physician of possible catheter leakage or transaction and embolization. If not present, see step 4.
   4. Attempt to aspirate with a 10 mL syringe (creates a greater vacuum).
   5. Move patient's arm, shoulder and head to see if a change in position will allow aspiration. If aspiration can only be accomplished with the patient in a certain position, the physician should be examined to see if the catheter has been placed in the "pinch-off" area. See step 6.
   6. Obtain physician's order for a chest X-ray to determine the position of the catheter.
   7. If the catheter tip is not in the superior vena cava, the catheter should be repositioned.
   8. Consider use of thrombolytic agent per your institution's policy.
   9. Use of fibrinolitic agent has successfully cleared clotted catheters when gentle irrigation and aspiration have failed. The instructions provided by the drug manufacturer should be followed.

**Warning:** Alcohol should not be used to soak or desiccate polyurethane catheters because alcohol is known to degrade the polyurethane catheters over time with repeated and prolonged exposure. See PowerPort® Implantable Port Nurse Guide for more details.

**Check For Patency Prior To Power Injection**

Aspirate for adequate blood return and vigorously flush the port with at least 10 mL of sterile normal saline.

**Warning:** Failure to ensure patency of the catheter prior to power injection studies may result in port system failure.

Please consult product labels and inserts for additional safety information and instructions for use.

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**Additional Information**

- **Product Use:** The PowerPort® Implantable Port System is indicated for power injection of contrast media during CE/CCT scans when a PowerLoc® Safety Infusion Set is used. For non-power injection, a huber needle of appropriate length and gauge can be used.
- **Access Indications:** The PowerPort® Implantable Port System may be used in conjunction with any power injection system to deliver contrast media to the patient's vascular system.
- **Recommended Flushing Volumes:**
  - **Open-Ended Catheter:** 5 mL heparin flush solution every 24 days.
  - **After each infusion of medication or TPN:** 10 mL sterile normal saline, then 5 mL heparin flush solution.
  - **After blood withdrawal:** 20 mL sterile normal saline, then 5 mL heparin flush solution.
  - **After power injection of contrast media:** 10 mL sterile normal saline, then 5 mL heparin flush solution.
- **Groshong® Catheter:** 0.11 mL.
- **BD Silicone Catheter:** 0.02 mL.
- **BD Groshong® Catheter:** 0.02 mL.
- **BF Groshong® Catheter (dual lumen):** 0.02 mL.
- **Reservoir Volume:** 0.6 mL.
- **Recommended Port Volume:** 0.6 mL.
- **PowerPort® Implantable Port:** 0.6 mL.
- **PowerLoc® tP Implantable Port:** 0.6 mL.
- **PowerPort® Skin Implantable Port:** 0.6 mL.

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**PowerPort® Implantable Port**

*Implantable Port System can be used to infuse or flush IV fluids, parenteral nutrition solutions, blood products, and for the withdrawal of blood samples. All materials are biocompatible, can be used with virtually all injectable solutions and are safe with CECT.*

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**PowerLoc® Safety Infusion Set**

*All materials are biocompatible, can be used with virtually all injectable solutions and are safe with CECT.*

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**Guidelines for Nurses**

*See the PowerPort® Implantable Port Nurse Guide for more details. Please consult product labels and inserts for additional safety information and instructions for use.*

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**S120392 Rev. 0**

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