Implanted Ports
With Open-Ended Catheters

BARD
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Introduction

Description

The BardPort*, SlimPort* and X-Port* Implanted Ports with open-ended catheters are totally implantable vascular access devices designed to provide repeated access to the vascular system for the delivery of medications, intravenous fluids, parenteral nutrition solutions, and blood products. They are also indicated for the withdrawal of blood samples. Port access is performed by percutaneous needle insertion using a non-coring needle.

The system consists of two primary components: an injection port with a self-sealing silicone septum and a radiopaque silicone or ChronoFlex® polyurethane catheter. All materials are biocompatible and can be used with virtually all injectable solutions.

Indications For Use

The BardPort*, SlimPort* and X-Port* Implanted Ports are indicated for patient therapies requiring repeated access to the vascular system. The port system can be used for infusion of medications, I.V. fluids, parenteral nutrition solutions, blood products, and for the withdrawal of blood samples.

Contraindications, Warnings, Cautions and Precautions

Contraindications

The device is contraindicated whenever:

- The presence of device related infection, bacteremia, or septicemia is known or suspected.
- The patient's body size is insufficient to accommodate the size of the implanted device.
- The patient is known or is suspected to be allergic to materials contained in the device.
• Severe chronic obstructive lung disease exists.
• Past irradiation of prospective insertion site.
• Previous episodes of venous thrombosis or vascular surgical procedures at the prospective placement site.
• Local tissue factors will prevent proper device stabilization and/or access.

Warnings
• Intended for Single Patient Use. DO NOT REUSE. Bard Access Systems, Inc. implanted port products are single use devices and should never be reimplanted. Any device that has been contaminated by blood should not be reused or resterilized.
• Alcohol should not be used to soak or declot polyurethane catheters because alcohol is known to degrade polyurethane catheters over time with repeated and prolonged exposure.
• After use, this product may be a potential biohazard. Handle and discard in accordance with accepted medical practice and applicable local, state and federal laws and regulations.
• Hold thumb over exposed opening of sheath to prevent air aspiration. The risk of air aspiration is reduced by performing this part of the procedure with the patient performing the Valsalva maneuver.
• Avoid vessel perforation.
• Pinch-off Prevention: Catheters placed percutaneously or through a cut-down, into the subclavian vein, should be inserted at the junction of the outer and middle thirds of the clavicle, lateral to the thoracic outlet. The catheter should not be inserted into the subclavian vein medially, because such placement can lead to compression of the catheter between the first rib and the clavicle, which can cause damage and even severence of the catheter. A radiographic confirmation of catheter placement should be made to ensure that the catheter is not being pinched by the first rib and clavicle.¹ ²
Signs of Pinch-off

Clinical:
• Difficulty with blood withdrawal
• Resistance to infusion of fluids
• Patient position changes required for infusion of fluids or blood withdrawal

Radiologic:
• Grade 1 or 2 distortion on chest X-ray.
Pinch-off should be evaluated for degree of severity prior to explanation. Patients indicating any degree of catheter distortion at the clavicle/first rib area should be followed diligently. There are grades of pinch-off that should be recognized with appropriate chest x-ray as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Severity</th>
<th>Recommended Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 0</td>
<td>No distortion</td>
<td>No action.</td>
</tr>
<tr>
<td>Grade 1</td>
<td>Distortion present without luminal narrowing</td>
<td>Chest x-ray should be taken every one to three months to monitor progression of pinch off to grade 2 distortion. Shoulder positioning during chest x-rays should be noted as it can contribute to changes in distortion grades.</td>
</tr>
<tr>
<td>Grade 2</td>
<td>Distortion present with luminal narrowing</td>
<td>Removal of the catheter should be considered.</td>
</tr>
<tr>
<td>Grade 3</td>
<td>Catheter transection or fracture</td>
<td>Prompt removal of the catheter.</td>
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Cautions
• Carefully read and follow all instructions prior to use.
• Federal (U.S.A.) law restricts this device to sale by or on the order of a physician.
• Only qualified healthcare practitioners should insert, manipulate and remove these devices.
• When utilizing the Arm Placement via Brachial/Basilic approach, the port should not be placed in the axillary cavity.
• Avoid inadvertent puncture of the skin or fascia with the tip of the tunneler.
• If the guidewire must be withdrawn while the needle is inserted, remove both the needle and wire as a unit to help prevent the needle from damaging or shearing the guidewire.
• Prior to advancing the catheter lock, ensure that the catheter is properly positioned. A catheter not advanced to the proper region may not seat securely and lead to dislodgment and extravasation. The catheter must be straight with no sign of kinking. A slight pull on the catheter is sufficient to straighten it. Advancing the catheter lock over a kinked catheter may damage the catheter.

**Precautions**

• Follow Universal Precautions when inserting and maintaining the catheter.
• Follow all contraindications, warnings, cautions, precautions and instructions for all infusates as specified by their manufacturers.
• Precautions are intended to help avoid catheter damage and/or patient injury.

**I. Prior to placement:**

• Examine package carefully before opening to confirm its integrity and that the expiration date has not passed. The device is supplied in a double sterile package and is non-pyrogenic. Do not use if package is damaged, opened or the expiration date has passed. Sterilized by ethylene oxide. Do not resterilize.
• Inspect kit for presence of all components.
• Fill (prime) the device with sterile heparinized saline or normal saline solution to help avoid air embolism.
• When using an introducer kit, verify that the catheter fits easily through the introducer sheath.

**II. During placement:**

• Do not allow accidental device contact with sharp instruments. Mechanical damage may occur. Use only smooth edged, atraumatic clamps or forceps.
• Do not perforate, tear, or fracture the catheter when using a guidewire.
• Do not use the catheter if there is any evidence of mechanical damage or leaking.
• Do not bend catheter at sharp angles during implantation. This can compromise catheter patency.
• Carefully follow the connection technique given in these instructions to ensure proper catheter connection and to avoid catheter damage.
• Do not occlude or cut catheter when using sutures to secure catheter.
• When using peel-apart introducers:
  - Carefully insert the introducer and catheter to avoid inadvertent penetration to vital structures in the thorax.
  - Avoid blood vessel damage by maintaining a catheter or dilator as internal support when using a peel-apart introducer.
  - Avoid sheath damage by simultaneously advancing the sheath and dilator as a single unit using a rotational motion.

III. After placement:
• Do not use the device if there is any evidence of mechanical damage or leaking. Damage to the catheter may lead to rupture, fragmentation, possible embolism, and surgical removal.
• Accessories and components with Luer Lock connections should be used with this device.
• If signs of extravasation exist, discontinue injections. Begin appropriate medical intervention immediately.
• DO NOT USE A SYRINGE SMALLER THAN 10 CC! Infusion pressure greater than 25 psi (172 kPa) may damage blood vessels and vescus and is not recommended.
• Use only non-coring needles with the port.
• Choose a needle length based on reservoir depth, tissue thickness, and the thickness of any dressing beneath the bend of the needle.
• Confirm correct positioning of the needle within the port reservoir by aspiration of blood before infusion of any substance. If there is doubt regarding proper needle placement, perform a radiographic dye procedure to confirm placement.
Possible Complications

The use of a subcutaneous port provides an important means of venous access for critically ill patients. However, the potential exists for serious complications, including the following:

- Air Embolism
- Bleeding
- Brachial Plexus Injury
- Cardiac Arrhythmia
- Cardiac Tamponade
- Catheter or Port Erosion
- Through the Skin
- Catheter Embolism
- Catheter or Port Occlusion
- Catheter Occlusion, Damage or Breakage due to Compression Between the Clavicle and First Rib
- Catheter or Port-related Sepsis
- Device Rotation or Extrusion
- Endocarditis
- Extravasation
- Fibrin Sheath Formation
- Hematoma
- Hemothorax
- Hydrothorax
- Intolerance Reaction to Implanted Device
- Inflammation, Necrosis, or Scarring of Skin over Implant Area
- Laceration of Vessels or Viscus
- Perforation of Vessels or Viscus
- Pneumothorax
- Spontaneous Catheter Tip Malposition or Retraction
- Thoracic Duct Injury
- Thromboembolism
- Vascular Thrombosis
- Vessel Erosion
- Risks Normally Associated with Local and General Anesthesia, Surgery, and Post-Operative Recovery

These and other complications are well documented in medical literature and should be carefully considered before placing the port.
Implantation Instructions

Read the “Contraindications, Warnings, Cautions, and Precautions and Possible Complications” sections of this manual before beginning procedure.

Implantation Preparation

1. Select implantation procedure to be used (upper arm, cut down, or percutaneous).
2. Select the site for port placement.
   
   **Note:** The port site should be distal to the vein insertion site in upper arm placements. **Note:** The infraclavicular fossa is a satisfactory site, but the actual site will vary based on individual patient factors. Port pocket site selection should allow for port placement in an anatomic area that provides good port stability, does not interfere with patient mobility (if arm placement, consider arm and elbow movement), does not create pressure points, and does not interfere with clothing. Consider the amount of cutaneous tissue over the port septum as excessive tissue will make access difficult. Conversely, too thin a tissue layer may lead to port erosion. A tissue thickness of 0.5cm to 2 cm is appropriate.
3. Complete patient implant record, including product reorder number and lot number.
4. Perform adequate anesthesia.
5. Create sterile field and open tray.
6. Surgically prep and drape the implantation site.
7. **For Attachable Catheters:** Using flush connector, flush open-ended catheters with heparinized saline and clamp the catheter closed several centimeters from the distal (port) end.
   
   **Note:** Clamp catheter segments that will be cut off prior to attachment.

   **For Preconnected Catheters:** Use a non-coring needle to flush the port and catheter system with heparinized saline. Estimate the catheter length required to reach the junction of the superior vena cava and the right atrium by placing the catheter on the chest along the venous path. Mark and cut the catheter on a 90° angle at the desired position. Tunnel catheter from the pocket to the venous entry site.
**Cut-Down Procedure**

1. Place patient in the Trendelenburg position with head turned away from the intended venipuncture site. Use a cut-down incision to expose the entry vein of choice.
2. Perform vessel incision after vessel is isolated and stabilized to prevent bleeding and air aspiration.
3. Insert the tapered end of the vein pick through the incision and advance it into the vessel.
4. With the vein pick in position, slide the catheter tip into the grooved underside of pick and advance the catheter tip into the vessel.
5. Withdraw the vein pick.
6. Advance the catheter into the vessel to the desired infusion site. **Note:** Catheters should be positioned with the catheter tip at the junction of the superior vena cava and the right atrium. Verify correct catheter tip position, using fluoroscopy, or appropriate technology. Do not occlude or cut catheter when using sutures to secure catheter.
Percutaneous Procedure, Subclavian Vein Approach

1. Place patient in the Trendelenburg position with head turned away from the intended venipuncture site.
2. Locate desired vessel using a small gauge needle attached to a syringe. Note: The subclavian vein is entered percutaneously at the point that identifies the junction of the outer and middle thirds of the clavicle.
   Refer to the “Warnings” section covering catheter Pinch-off.

3. Attach introducer needle to the syringe and insert into vessel alongside the small gauge needle. Remove small gauge needle.
4. Aspirate gently as the insertion is made. If the artery is entered, withdraw the needle and apply manual pressure for several minutes. If the pleural space is entered, withdraw the needle and evaluate patient for possible pneumothorax.

5. When the subclavian vein has been entered, remove the syringe leaving the needle in place. Place a finger over the hub of the needle to minimize blood loss and the risk of air aspiration.

The risk of air aspiration is reduced by performing this part of the procedure with the patient performing the Valsalva maneuver.

6. Straighten "J" tip of guidewire with tip straightener and insert tapered end of tip straightener into the needle.

7. Remove the tip straightener and advance the guidewire into the superior vena cava. Advance the guidewire as far as appropriate for the procedure. Verify correct positioning, using fluoroscopy, or appropriate technology.
8. Gently withdraw and remove needle. **Caution:** If the guidewire must be withdrawn while the needle is inserted, remove both the needle and wire as a unit to help prevent the needle from damaging or shearing the guidewire.

9. Make a small (approx. 1 cm wide) incision parallel to the clavicle with the guidewire at the center of the incision to permit introduction of vessel dilator and sheath introducer.

**Upper Arm Placement via Brachial/Basilic Approach**

**Relevant Anatomy**

- Clavicle and Subclavius Muscle
- 1st Rib
- Median Nerve
- Brachial Artery
- Brachial Veins
- Ulnar Nerve
- Basilic Vein
- Medial Antebrachial Cutaneous Nerve
Caution: When utilizing the Arm Placement via Brachial/Basilic approach, the port should not be placed in the axillary cavity.

1. Position the arm in an abducted, externally rotated position.
2. Puncture the selected brachial or basilic vein at the midpoint of the arm with an introducer needle.
3. Under fluoroscopic guidance, advance a long guidewire through the needle into the accessed vein and into the superior vena cava.
4. Remove the needle and make a small incision over the guidewire. Insert a vessel dilator, if preferred, to help maintain venous access.
5. Make a transverse incision, approximately 2.5 cm, over the port pocket site.
6. Create a subcutaneous port pocket using blunt dissection so that the port does not lie beneath the incision.
7. Remove the guidewire and dilator, if used, and introduce the catheter to the desired infusion site. A percutaneous introducer sheath may be used at this time.

**Peel-Apart Sheath Introducer Instructions**

1. Advance the vessel dilator and sheath introducer as a unit over the exposed wire using a rotational motion. Advance it into the vein as a unit, leaving at least 2 cm of sheath exposed.

**WARNING:** Avoid vessel perforation.
2. Release the locking mechanism and gently withdraw the vessel dilator and "J" wire, leaving the sheath in place.

3. **WARNING:** Hold thumb over exposed opening of sheath to prevent air aspiration. The risk of air aspiration is reduced by performing this part of the procedure with the patient performing the Valsalva maneuver.

4. Insert catheter into the sheath. Advance the catheter through the sheath into the vessel to the desired infusion site. Catheters should be positioned with the catheter tip at the junction of the superior vena cava and the right atrium.

5. Verify correct catheter tip position using fluoroscopy, or appropriate technology.
6. Grasp the two handles of the peel-apart sheath and pull outward and upward at the same time.

7. Peel the sheath away from the catheter completely. Make sure the catheter is not dislodged from vessel.

**Catheter Tunneling Procedure**

1. Create a subcutaneous pocket using blunt dissection. Note: Do a trial placement to verify that the pocket is large enough to accommodate the port and that the port does not lie beneath the incision.

**Attachable Catheters**

Create a subcutaneous tunnel from the venous site to the port pocket site using tunneler or long forceps per the following:

- **a.** Make a small incision at the venous entry site.
- **b.** Insert tip of tunneler into the small incision.
- **c.** Form tunnel by advancing tip of tunneler from the venous entry site to the port pocket site. **Caution:** Avoid inadvertent puncture of the skin or fascia with the tip of the tunneler.
- **d.** Remove catheter lock from the catheter.
- **e.** Attach end of catheter onto the tunneler barb with a twisting motion. **Note:** Barb threads must be completely covered by the catheter to adequately secure the catheter as it is pulled through the tunnel. A suture may be tied around the catheter between the tunneler body and the large barb to hold it more securely.
f. Pull the tunneler through to the port pocket site while gently holding the catheter. **Note:** The catheter must not be forced.
g. Place catheter lock back onto catheter.
h. Cut the catheter to the proper length at a 90° angle, allowing sufficient slack for body movement and port connection.

Preconnected Catheters
Create subcutaneous tunnel from the port pocket site to the venous entrance site per the following:

- a. Advance the tip of the tunneler from the port pocket site to the venous entry site
- b. Form tunnel by advancing the tip of the tunneler from the port pocket site to the venous entry site.
  **Caution:** Avoid inadvertent puncture of the skin or fascia with the tip of the tunneler.
- c. Thread the catheter tip on to the end of the tunneler.
- d. Pull the tunneler through to the venous entry site while gently holding the catheter. **Note:** The catheter must not be forced.
- e. Cut off the end of the catheter attached to the tunneler.
- f. Estimate the catheter length required for the tip placement at the junction of the superior vena cava and right atrium by placing the catheter on the chest along the venous path to the right atrium. Cut catheter to length at a 90° angle.
Connect Catheter to Port

1. Flush all air from the port body using a 10ml syringe with a non-coring needle filled with heparinized saline (100 USP U/ml). Insert the needle through the septum and inject the fluid while pointing the stem up.
2. Cleanse all system components with irrigation solution.
3. Connect catheter to port.

Caution: Prior to advancing the catheter lock, ensure that the catheter is properly positioned. A catheter not advanced to the proper region may not seat securely and lead to dislodgment and extravasation. The catheter must be straight with no sign of kinking. A slight pull on the catheter is sufficient to straighten it. Advancing the catheter lock over a kinked catheter may damage the catheter.

Single Lumen Ports
a. Align port stem with catheter.

Note: If the catheter and lock are connected and then disconnected, the catheter end must be re-trimmed to ensure a secure re-connection.
b. Advance catheter over port stem to midway point.
c. Advance catheter lock straight until flush with port.

**Note:** When using a “clearlock” catheter lock be sure the end containing a black, radiopaque ring is distal to the port.

**Dual Lumen Ports**

**Note:** If the catheter and lock are connected and then disconnected, the catheter end must be re-trimmed to ensure a secure re-connection.

a. With black dots on catheter facing up, align port stem with both lumens. **Note:** When using a “clearlock” catheter lock be sure the end containing a black, radiopaque ring is distal to the port.
b. Advance catheter over port stem to midway point.

c. Advance catheter lock until flush with port.

**Position Port and Close Incision Site**

1. Place the port in the subcutaneous pocket away from the incision line and secure to the underlying fascia using non-absorbable, monofilament sutures. This will reduce the risk of port migration and the possibility of it flipping over. Leave sufficient slack in the catheter to permit slight movement, and verify that the catheter is not kinked.

2. After suturing the port in the pocket, flush the wound with an appropriate antibiotic solution.

3. Conduct flow studies on the catheter using a non-coring needle and 10ml syringe to confirm that the flow is not obstructed, that no leak exists, and that the catheter is correctly positioned.

4. Aspirate to confirm the ability to draw blood.

5. Flush and heparin lock the port system as described under heparin lock procedure.

6. Close the incision site, so that the port does not lie beneath the incision.

7. Apply dressing according to hospital practice.
Use and Maintenance Instructions

Site Preparation
Always inspect and aseptically prepare the injection site prior to accessing the port.

Equipment:
- Alcohol wipe
- Antiseptic swabs (3)
- Sterile gloves

Procedure:
1. Explain procedure to patient. Warn of needle prick sensation. (Sensation of needle insertion decreases over time. Use of a topical anesthetic may be appropriate.)
2. Wash hands thoroughly.
3. Put on sterile gloves.
4. Paint area with alcohol wipe starting at the port and working outward in a spiral motion over an area 10-13 cm in diameter.
5. Repeat Step 4 with antiseptic swabs three times.

Note: Follow established hospital or institutional policy for changing I.V. tubing and accessing cannula. The Center for Disease Control (CDC) or Oncology Nursing Society (ONS) may have recommended guidelines.
Accessing Single Implanted Ports

Equipment:
- Non-corning needle
- Syringe, 10ml or larger

Procedure:
1. Perform aseptic site preparation.
2. Locate port septum by palpation.
   a. Locate base of port with non-dominant hand.
   b. Triangulate port between thumb and first two fingers of non-dominant hand. Aim for center point of these three fingers.
3. Insert needle perpendicular to port septum. Advance needle through the skin and septum until reaching bottom of reservoir.
4. Verify correct needle placement by blood aspiration.
5. Always flush the port following injection.
6. Perform heparin lock procedure.

Accessing Dual Implanted Ports

Equipment:
- Non-corning needle
- Syringe, 10ml or larger

Procedure:
1. Perform aseptic site preparation.
2. Locate port septum by palpation.
   a. Locate base of port with non-dominant hand.
   b. Locate center of dual port by palpating septum distinguishing ridge on top of port and place index finger of dominant hand to mark.
   c. Triangulate right or left side of dual port between thumb and first two fingers of non-dominant hand. Aim for center point of these three fingers.

3. Insert needle perpendicular to port septum. Advance needle through the skin and septum until reaching bottom of reservoir.
4. Verify correct needle placement by blood aspiration.
5. Flush each septum separately following injection.
6. Perform heparin lock separately on each septum.
Bolus Injection Procedure

Equipment:

• Non-coring needle
• 10ml syringe filled with sterile normal saline
• Extension set with clamp

Procedure:

Review Site Preparation and Accessing Implanted Port sections before proceeding with this section.

1. Explain procedure to patient and prepare injection site.
2. Attach non-coring needle to extension set and 10ml syringe filled with sterile normal saline. Expel all air and clamp extension.
3. Aseptically locate and access port.
4. Flush port with 10ml sterile normal saline. Clamp the extension set and remove the syringe.
5. Connect syringe containing the drug to extension set. Release clamp and begin to administer injection.
6. Examine the injection site for signs of extravasation; if noted, immediately discontinue the injection and initiate appropriate intervention.
7. When the injection is completed, clamp the extension set.
8. Flush after each injection with 10ml of sterile normal saline to help prevent interaction between incompatible drugs.

Note: The needle hub should not be left open to air while it is in the port. Do not manipulate the needle once it is in the septum.
Continuous Infusion Procedure

Equipment:
- Prescribed I.V. solution
- Extension set with clamp
- 10 ml syringe filled with sterile normal saline
- Non-coring needle
- I.V. pole
- I.V. pump (if ordered)
- Transparent dressing
- Antibacterial ointment
- 2 in. x 2 in. (5cm x 5cm) gauze pads

Procedure:
Review Site Preparation and Accessing Implanted Port sections before proceeding with this section.

1. Explain procedure to patient and prepare injection site.
2. Attach non-coring needle to extension set and 10 ml syringe filled with sterile normal saline. Expel all air and clamp the extension set.
3. Aseptically locate and access port.
4. Apply antibacterial ointment to injection site and place a rolled gauze pad under needle hub. Secure needle with transparent dressing to help prevent inadvertent dislodgement.
5. Open clamp and flush port with sterile normal saline. Clamp extension set and remove syringe.
6. Connect fluid delivery system (I.V. set or infusion pump as indicated).

Note: To provide additional security during pump infusion, tape all tubing connections. Pumps must incorporate a functional automatic pressure limiting switch which will shut pump off before pressure exceeds 25 p.s.i. (172 kPa).

7. Release clamp and initiate infusion. Examine the infusion site for signs of extravasation; if noted, or if patient experiences pain, immediately discontinue infusion and initiate appropriate intervention.
8. When infusion is completed, clamp extension set and then remove the fluid delivery system.
9. Flush after each infusion with 10 ml sterile normal saline to help prevent interaction between incompatible drugs.
10. Perform heparin lock procedure.

**Blood Sampling Procedure**

**Equipment:**
- Extension set with clamp
- Non-coring needle
- 10ml syringe filled with sterile normal saline
- 20ml syringe (2)
- Sterile normal saline

**Procedure:**
Review Site Preparation and Accessing Implanted Ports sections before proceeding with this section.
1. Explain procedure to patient and prepare injection site.
2. Aseptically locate and access port.
3. Flush port with sterile normal saline in 10ml syringe.
4. Withdraw at least 5ml of blood and discard syringe.
5. Aspirate desired blood volume into 20ml syringe.
6. Once sample is obtained, perform saline lock procedure by immediately flushing the system with 20ml of sterile normal saline.
7. Transfer sample into appropriate blood sample tubes.
8. Perform heparin lock procedure.
Heparin Lock Procedure

To help prevent clot formation and catheter blockage, implanted ports with open-ended catheters should be filled with sterile heparinized saline after each use. If the port remains unused for long periods of time, the heparin lock should be changed at least once every four weeks.

Recommended flushing volumes:

<table>
<thead>
<tr>
<th>FLUSHING VOLUMES</th>
<th>VOLUME</th>
</tr>
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<tbody>
<tr>
<td>Port not in use</td>
<td>5cc heparinized saline</td>
</tr>
<tr>
<td>After each infusion of medication or TPN</td>
<td>10cc sterile normal saline then 5cc heparinized saline</td>
</tr>
<tr>
<td>After blood withdrawal</td>
<td>20cc sterile normal saline then 5cc heparinized saline</td>
</tr>
</tbody>
</table>

Equipment:

- Non-coring needle
- 10ml syringe filled with sterile heparinized saline (100 U/ml)*

*Note: Other concentrations of heparinized saline (10 to 1000 U/ml) have been found to be effective. Determination of proper concentration and volume should be based on patient's medical condition, laboratory tests, and prior experience.
Procedure:
Review Site Preparation and Accessing Implanted Port sections before proceeding with this section.
1. Explain procedure to patient and prepare injection site.
2. Attach a 10 ml syringe filled with sterile heparinized saline to needle.
3. Aseptically locate and access port.
4. Flush the system.

Deaccessing Implanted Ports
Note: Always remove a non-coring needle slowly, while injecting the last 0.5ml of solution, to reduce potential for blood backflow into the catheter tip and possible catheter clotting. Stabilize the port with two fingers during needle withdrawal.

Use of Fibrinolytic Agent for Catheter Blockage
Use of a fibrinolytic agent has successfully cleared clotted catheters when gentle irrigation and aspiration have failed. The following procedure may be employed on the order of a physician. Additional instructions provided by the drug manufacturer should be followed.
Equipment:
- Non-coring needle
- 10ml syringe containing port priming volume of a fibrinolytic agent
- 20ml syringe filled with sterile normal saline.

Procedure:
Review Site Preparation and Accessing Implanted Ports sections before proceeding with this section.

1. Explain procedure to patient and prepare injection site.
2. Aseptically locate and access the desired septum with needle attached to 10ml syringe, void of air and filled with port priming volume of fibrinolytic agent.
3. Gently instill fibrinolytic solution. Use a gentle pull-push action on the syringe plunger to maximize solution mixing within port and catheter.
   Warning: Occluded catheters may not accept all of the solution. If strong resistance is felt, do not attempt to force into catheter.
4. Leave solution in place for 15 minutes.
5. Attempt to aspirate solution and the clot(s).
6. If the clot(s) cannot be aspirated, repeat procedure.
7. Once the blockage has been cleared, flush catheter with at least 20ml of sterile normal saline.
8. Perform heparin lock procedure.
References

An issued or revision date for these instructions is included for the user's information. In the event two years have elapsed between this date and product use, the user should contact Bard Access Systems, Inc. to see if additional product information is available.

Revised date: May 2003

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