

Subject: Medical Direction
Utilization of Pre-Existing Vascular Access Devices

Assosiated Policies:

I. Definition: A pre-existing vascular access device is an indwelling intravenous catheter or device placed into a central or peripheral vein. These devices allow vascular access for patients requiring intermediate or long term IV therapy or hemodialysis. These devices fall into several categories.

A. **Peripheral IV's:** Standard IV catheters and extension tubing such as would be placed in the field or emergency department. Patients on short term home IV therapy may present with these.

B. **Peripherally inserted central catheters ('PICC' lines):** A long central venous catheter which is inserted in a peripheral vein (generally the basilic or cephalic vein) terminating in the superior vena cava.

C. **Non-tunneled catheters:** A single or multi lumen catheter inserted percutaneously into the subclavian or jugular vein, terminating in the superior vena cava..

D. **Tunneled catheters (Broviac, Hickman, Groshong):** A single or multi lumen catheter surgically placed, which enters the skin (generally at the upper anterior chest wall), terminating in the superior vena cava.

E. **Implanted ports (Port-a-cath):** A device consisting of a circular stainless steel portal located beneath the skin of the anterior chest wall, connected to a subcutaneous catheter, terminating in the superior vena cava. The port itself is palpable, as well as visible. The anterior aspect of the port is covered with a self-sealing diaphragm through which IV fluids and medications can be injected.

F. **Hemodialysis shunts (grafts, fistulas):** A surgically created anastomosis between the arterial and venous circulation, with large lumen and high flow, utilized for hemodialysis.

II. Indications: Need for venous access.

III. Contraindications:

A. Absolute: None

B. Relative:

1. Dialysis shunts should not be used unless the patient is in arrest (or other extreme life-threatening circumstances) and no other IV access is available.
2. Implanted ports are designed for access with a non-coring needle. If non-coring needles are not available, these ports should only be used if the patient is in extremis and no other IV access is available.

Subject: Medical Direction
Utilization of Pre-Existing Vascular Access Devices

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IV. Adverse Effects:

- A. Infection: Strict and meticulous aseptic technique is critical when handling any PVAD.
- B. Embolism: Any central line provides a direct access to the central circulation, and introduction of air into these devices can create air embolus.
- C. Thrombus: Any IV catheter may develop clot formation, and dislodging clots may create a thrombotic embolus. Emboli may also be created if portions of the catheter are broken off.
- D. Catheter damage: PVADs are generally intended for long term use, and damage to the catheter can result in a need for replacement. Extreme care should be used in handling these devices.
- E. Bleeding: If the device is dislodged or damaged, bleeding may result. If necessary, clamp as directed in 'Procedure' section. NOTE: Dialysis shunts which access the arterial circulation may create life threatening bleeding. Direct pressure must be applied and firmly maintained if bleeding occurs from any shunt or fistula.

V. Equipment:

- A. Appropriate syringes
- B. Saline
- C. Needles as appropriate, including non-coring needle for access to any shunt, or port-a-cath.
- D. IV extension tubing, primed with saline.
- E. Sterile glove
- F. Alcohol wipes
- G. IV catheter clamp, or padded hemostat
- H. Tape
- I. Pressure bag if accessing dialysis shunt
- J. Fluids or medications to be administered. NOTE: Any IV solution or medication can be administered without problems, except diazepam (Valium). Diazepam may damage silastic catheters and should be avoided except in critical situations. If diazepam must be given through a PVAD, flush tubing promptly with at least 10 cc of sterile saline.

VI. Procedure:

- A. **Peripheral IV lines:** Carefully cleanse injection cap with alcohol wipe, and allow to dry if time permits. Check extension tubing and unclamp, if necessary. Use a standard needle, or needle-less connector (if available) to administer medications or IV fluids.

Subject: Medical Direction
Utilization of Pre-Existing Vascular Access Devices

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B. Peripherally inserted central lines (PICC catheters) tunneled, and non-tunneled catheters: Prep and access injection cap on these catheters with the same procedure as with section above (Peripheral IV lines).

C. Implanted ports (Port-a-cath):

1. If a non-coring needle is available, use sterile normal saline to prime the attached tubing and injection cap, as well as a 10cc syringe with 20G 1 inch (or smaller) needle. Close clamp.
2. If no non-coring needles are available, use sterile normal saline to prime a 10cc syringe and extension tubing with injection cap. Attach a 20G 1 inch (or smaller) needle. Close clamp.
3. Using an alcohol wipe, start at the center of the port and circle outward toward the periphery of the port, allowing a 2-inch border on all sides. Repeat this procedure x2 with fresh alcohol wipes each time.
4. Repeat cleansing procedure with three Betadine swabs, if available.
5. Put on sterile gloves.
6. Palpate port to locate central diaphragm or septum.
7. While stabilizing port with thumb and index finger of one hand, firmly insert the needle perpendicular to the skin. Advance the needle until it touches the bottom of the port or until it is fully advanced. The needle cannot puncture the back wall of the port.
8. Open the clamp and aspirate for blood return. If blood return is present, flush with 10 cc sterile normal saline.
 - a. If no blood return, observe for tissue swelling or discomfort around the port while gently flushing.
 - b. If unable to flush, reposition needle. Use gentle push-pull technique to attempt to flush. If unable, consider this access unusable.
9. Place a sterile 2x2 under or around the needle as needed for stabilization. Apply transparent dressing or other sterile dressing material.
10. Utilize the injection cap to administer IV fluids or medications as indicated.

D. Hemodialysis (arteriovenous) shunts or fistulas: As noted above, these devices should only be accessed if the patient is in life threatening circumstances and no other venous access is available.

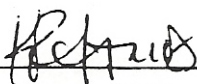
1. If a non-coring needle is available, use sterile normal saline to prime the attached tubing and injection cap, as well as a 10cc syringe with 20G 1-inch needle. Close clamp.
2. If no non-coring needles are available, use sterile normal saline to prime a 10cc syringe and extension tubing with injection cap. Attach a 20G 1-inch needle. Close clamp.


Subject: Medical Direction
Utilization of Pre-Existing Vascular Access Devices

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3. Prepare an IV solution with a pressure bag, or BP cuff inflated to 100 – 150 mm/Hg. Flush tubing and close clamps.
 4. Locate device, usually in the forearm. Multiple fistulas or shunts may be present in patients with long term dialysis history. Not all shunts are working devices. Determine via history or by inspection for recent needle marks which device is currently being used. Working devices also generally have a palpable “thrill” or bruit present.
 5. Cleanse the site thoroughly. Using an alcohol prep pad, begin in the center of the injection site and cleanse in a circular pattern to a size of 2 – 3 inches in diameter. Repeat x 2, with fresh alcohol wipes for each. If Betadine wipes are available, repeat wipes x 3 with Betadine.
 6. Select the smallest gauge needle/catheter appropriate.
 7. Insert the needle/catheter near the most recent apparent access sites. Be ready for high pressure and/or rapid flow of blood. Attach IV fluid with pressure device. Administer IV bolus medications via the IV line.
 8. See note above Section IV. E if bleeding from site occurs.

NOTE: If the patient has an existing IV fluid line in place, with or without an I V pump, contact the base hospital for direction about whether to continue the IV infusion. Be prepared to provide information about the type of fluid or medication being given.

Approved: 

Approved as to Form: 

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