Infusion Therapy Educational Program

Implanted Port Management

Implanted Port Management

General Knowledge

- An implanted venous port differs from the other types of central lines in that it is located completely under the skin, with no external entrance or exit site.
- The implanted port is made of 3 parts, the catheter, the reservoir and the septum
- The **catheter** is inserted into the subclavian vein or, in the case of a PICC port, into a major vein in the upper extremity, and advanced to the cavoatrial junction.
- the catheter is connected to a titanium, stainless steel or plastic **reservoir**.
- The top of the reservoir is covered by a silicone **septum**.

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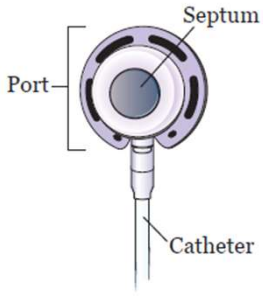
General Knowledge



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General Knowledge

- To utilize the catheter for infusion therapy or blood withdrawal, the reservoir is accessed by inserting a special, **non-coring needle** through the skin covering the septum, through the septum, and into the reservoir.
- There are several different brands of this special needle that have a unique bend at the needle's end to prevent it from coring out small pieces of the silicone port septum.
- Medications and solutions can be infused, and blood can be withdrawn through this needle.
- The septum can withstand up to **2,000 needle punctures** with this special type of needle.

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General Knowledge

- A sterile dressing is required over the site when the reservoir is accessed.
- A port may be single lumen or double lumen. Double lumen ports have separate reservoirs and a separate catheter attached to each reservoir.
- The catheter end may have staggered tips terminating at the cavoatrial junction, which allow incompatible medications to be administered simultaneously without negative consequences.

Single Lumen Double Lumen

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Advantages of an implanted port

- Because the port is completely internal, there is less risk of catheter-associated infection than with other types of central venous access devices.
- Because there are no external components to the port when not accessed, there are no activity restrictions.
- Ports have a relatively low maintenance cost when not in use. The only maintenance is a once-a-month flush procedure.
- Ports have a long dwell time compared to most other types of central lines.

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disadvantages of an implanted port

- Insertion and removal of a port involves a surgical procedure.
- A port insertion is more expensive than other central venous access device insertions.
- A needle stick is required periodically – once a week when the port is in use and once a month when dormant.
- Medication infiltration is possible if the port access needle becomes dislodged from the septum during an infusion.

Indications

- Ports are indicated in conditions that require chronic, intermittent venous access like cancer, Sickle Cell Disease, Cystic Fibrosis, Lupus, Rheumatoid Arthritis, Crohn's Disease, and Chronic Inflammatory Demyelinating Polyneuropathy (CIDP).

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Accessing an implanted port

- An implanted port is accessed whenever entry into the venous system is necessary for medication, solution, or blood product administration, for blood specimen withdrawal for laboratory tests, or for monthly port flushing to prevent port catheter occlusion.
- Between such uses, the port remains de-accessed.
- The clinician responsible for providing infusion therapy to a patient or resident with a port should be versed in its use.
- Each facility should determine this time interval and include the parameter in its Policy and Procedure manual. (Usually recommended to rotate needle ounce a week)
- When a port is not accessed it should be accessed to be flushed ounce a month.

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Non-coring needle selection

- An assessment should be completed to determine the correct gauge and length of access needle appropriate for the patient.
- You should use the smallest gauge, shortest length needle appropriate for the patient's port depth and therapy.
- Port access needles are available in sizes ranging from 19 to 25 gauge and lengths from ½ inch to 2 inches.
- The infusate to be delivered and the depth of the reservoir determine the particular needle used for any individual patient.
- A thin patient whose port is visible and palpable just under the skin will require a ½ inch long needle whereas an obese patient whose port was inserted under a significant amount of adipose tissue may require a 2-inch long needle.
- The needle should be long enough to reach the bottom of the reservoir and sit against, but not press into the skin.

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Non-coring needle selection

- The needle should be long enough to reach the bottom of the reservoir and sit against, but not press into the skin.
- Please review the manufacturer's instructions for use for the needle used within your institution.
- Some ports are designed to tolerate the high pressure necessary for power injection during certain radiologic imaging procedures.
- It's important to remember that not only must the port be designed for power injection, but the non-coring needle must also be compatible with power injection.
- The clinician must verify that both the port and the non-coring needle are indicated for power injection prior to any such use

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Examples non-coring devices available on the market

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Topical Anesthesia

- Most patients find the port access procedure slightly uncomfortable, but within tolerable limits. Some find that, with time, the port site becomes calloused resulting in little or no pain during the needle insertion.
- Others, however, prefer to use a topical anesthetic to numb the skin over the port septum. Several methods or products are available to achieve topical anesthesia.
- Examples of Topical anesthetic
  - Ethyl chloride spray
  - Lidocaine cream

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Implanted Port Complications

- Although ports have the lowest complication rate of all types of central venous access devices when used intermittently, they are not without potential adverse occurrences.
- The clinician caring for a patient with an implanted port should be familiar with the possible complications related to the device, be able to recognize a complication, and intervene appropriately to prevent or minimize a serious outcome.
- Some complications are common to all central venous access devices such as catheter tip **malposition**, catheter **occlusion**, **venous thrombus**, and **infection**. There are also complications unique to implanted ports such as **reservoir malposition, disconnection of the catheter from the reservoir, and infiltration or extravasation.**

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Implanted Port Complications

Malpositioned Catheter

- The distal tip of the port catheter should sit at the cavoatrial junction, the site at which the Superior Vena Cava meets the right atrium of the heart. The most common location for catheter malposition or migration is the internal jugular, although it could also migrate to other veins such as the innominate, subclavian, axillary, or mammary, to name a few.

Treatment and Intervention

- Stop infusion
- Catheter tip position can be determined by radiographic evaluation using contrast dye injection
- If migration is confirmed, the catheter must be re- positioned or replaced

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Reservoir Malposition

- The sutures securing the port to the underlying tissue become loose or dislodged allowing the reservoir to move or flip on its side or upside down
- A Malpositioned reservoir may also kink the catheter itself

Treatment and Intervention

- Reservoir position can be determined by radiographic evaluation
- If malposition is confirmed, the reservoir must be re- positioned and re- sutured
- Do not attempt to turn the reservoir back into proper position as this may damage the catheter or separate it from the reservoir

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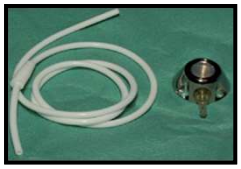
Catheter Separation

- The catheter becomes disconnected from the reservoir

Treatment and Intervention

- Stop infusion
- Catheter/reservoir disconnection can be determined by radiographic evaluation using contrast dye injection through the port
- If disconnection is confirmed, the catheter will be retrieved as necessary and the port must be replaced



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Implanted Port Complications

Catheter Occlusion

- Catheter occlusion is the partial or complete obstruction of a vascular access device (VAD) preventing or limiting the infusion of a solution or medication
- Thrombotic: caused by the development of a thrombus due to fibrin or coagulated blood within or surrounding the catheter
- Non-Thrombotic: caused by mechanical obstruction such as catheter malposition or migration, drug, lipid or mineral precipitates

Treatment and Intervention

- Determine likely cause of occlusion
- Thrombotic: Instill thrombolytic agent such as Cathflo®.
- Non-Thrombotic: Mineral or drug precipitates are treated according to the drug pH, using hydrochloric acid, sodium bicarbonate, or sodium hydroxide
- Lipid occlusions are treated with 70% ethanol

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Infiltration

- Inadvertent administration of non-vesicant medication or solution into surrounding tissue

Treatment and Intervention

- Stop infusion
- Notify licensed independent practitioner
- Warm or cool compresses as ordered
- Radiographic evaluation

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Extravasation

- Inadvertent administration of a vesicant solution or medication into surrounding tissue
- A vesicant solution is one that causes severe tissue damage and necrosis at the site of extravasation

Treatment and Intervention

- Treatment is dependent on the properties of the drug or extravasated solution
- Consider the type, volume and concentration of the vesicant infused
- Stop infusion
- Attempt to aspirate infusate through the port access needle
- Leave Huber needle in place
- Call pharmacist for possible antidote information
- Call licensed independent practitioner for orders for treatment
- Treatment may include the instillation of an antidote

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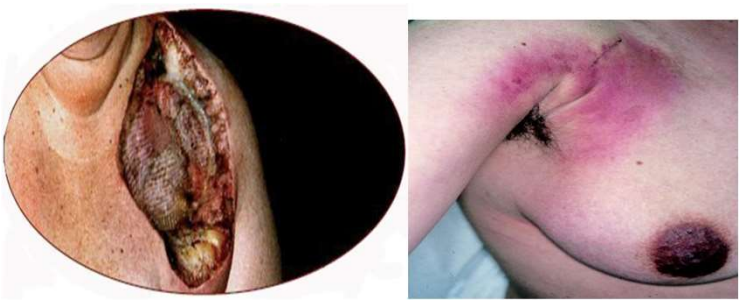
Extravasation



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Local Infection

- The presence and growth of a pathogenic microorganism
- Catheter related infection is a potentially life-threatening complication of infusion therapy; it may be local, systemic or both

Treatment and Intervention

- Notify licensed independent practitioner and obtain orders
- Obtain cultures of the site exudate as ordered
- Apply antibiotic ointment if ordered
- If a port pocket infection is suspected, do not access the port
- Possible removal of the port if also associated with systemic symptoms

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Local Infection

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Catheter Related Blood Stream Infection (CRBSI) Or Septicemia

- The presence of infectious microorganisms or their toxins in the blood stream

Treatment and Intervention

- Monitor vital signs
- Notify licensed independent practitioner
- Obtain blood cultures if ordered
- Initiate oral or parenteral anti- infective therapy as ordered
- Change all tubing, extension sets and needleless connectors
- If solution is suspected as contaminated; obtain cultures of the infusate

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Skin Breakdown

- Skin breakdown over port septum

Treatment and Intervention

- Port may need to be removed
- Notify licensed independent practitioner
- Cover the site with Sterile dressing until you get the patient evaluated.