



### ***Nursing Practice Reference***

**Title: CENTRAL VENOUS ACCESS DEVICES (CVADs): CARE AND MAINTENANCE OF IMPLANTED VENOUS ACCESS DEVICES (IVADs)**

**Effective Date: February, 2016**

**Approved:**

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**Sites:**

All

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Other

**Reason for Directive:**

To provide guidelines for the care and maintenance of Implanted Venous Access Devices (IVADs). An IVAD may also be referred to as a port or Port-a-Cath®.

**These guidelines are used in conjunction with:**

[PHSA Hand Hygiene Policy](#)

BCCA Infection Prevention and Control Manual

<H:\EVERYONE\Infection Control\BCCA Infection Prevention and Control Manual\BCCA Manual final -Dec 2015.pdf>

BCCA Infusion Therapy Education program for Registered Nurses -

<H:\EVERYONE\nursing\Provincial Nursing Orientation Program\2. Provincial Nursing Orientation\13. BCCA Infusion Therapy Education Program for Registered Nurses.doc>

I-490 IV therapy: Use of an Infusion Pump with Dose-error Reduction Software -

<H:\EVERYONE\nursing\REFERENCES AND GUIDELINES\BCCA Nursing Practice Reference Manual\I-490 IV Therapy - Use of Infusion Pump with Dose Error Reduction Software.pdf>

[C-252 Chemotherapeutic agents, administration](#)

[BCCA ST Policy III-20 Prevention and Management of Extravasation of Chemotherapy](#)

[BCCA ST Policy III-80 Assessment of Needle Placement / Catheter Patency in CVC Devices](#)

[VCH-Blood Collection Quick Reference Guide](#)

\*cap = Neutral Displacement Needleless Connector

<H:\EVERYONE\nursing\EDUCATION> Central Venous Access Devices - Naturopathic Doctors:

- Central Venous Access Devices: Naturopathic Doctor Position Statement  
<H:\EVERYONE\nursing\EDUCATION\Central Venous Access Devices - Naturopathic Doctors\Naturopathic Doctor Position Statement.docx>
- Patient handout: Naturopathic Doctor- Use of Central Venous Access Devices FAQ  
<H:\EVERYONE\nursing\EDUCATION\Central Venous Access Devices - Naturopathic Doctors\Naturopathic Doctors - Central Venous Access Devices FAQs.docx>

**NOTE for Midline Catheters:**

- Midlines are **not** recommended for use at BCCA because of the difficulty in detecting infiltration or extravasation, and the risk of complications.
- Midline catheters are **peripheral** infusion devices with the tip terminating in either the basilic, cephalic, or brachial vein, distal to the shoulder. The catheter tip does **not** enter the central vasculature. **If no other vascular access is possible, refer to NPR I-390, Directive 19, page 4 for more information on appropriate and inappropriate infusates.**

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\*cap = Neutral Displacement Needleless Connector

**DIRECTIVES:****Clinical Competency Validation:**

The Registered Nurse (RN) /student nurse must have completed the BCCA Infusion Therapy Education Program for RNs and subsequent skill validation in order to perform **any** procedure on a CVAD.

**Patient Education:**

- To include schedule for care and management, role in self-care, signs, symptoms and potential for infection and occlusion and when, how and to whom to report changes.
- Standard BCCA materials related to self-care of IVADs will be used. Patient Information Handout for IVADs is located in Appendix A.

**Features:*****Single or multi-lumen:***

- Each lumen of a multi-lumen IVAD is treated as a separate catheter.
- Recommend that where possible, the largest (gauge) lumen be used for blood sampling, blood product administration and administration of viscous or high volume fluids.

***Valved:***

- A valve is present near the distal tip of the catheter or proximally, adjacent to the septum.
- Clamping is **not** required as the valve is closed except during infusion or aspiration.

***Non-Valved:***

- The catheter is open at the distal tip.
- The catheter requires clamping before access and de-access of the system.
- Huber needle sets must have clamps built in to allow for clamping of the line.

***Power Capable Devices:***

- RNs may carry out routine care for any IVADs including identifying a power IVAD and accessing for power injection of contrast.
- No special care needs unless the IVAD is being used for power injection for diagnostic imaging purposes. Power IVAD compatible pressure-rated needle and special tubing is needed to withstand the higher intraluminal pressures generated during power injection.

***NB:*** *If an IVAD is unfamiliar, contact the manufacturer's clinical support line to determine device care or obtain device policy from the insertion facility.*

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**Insertion/Removal:**

- An IVAD must be inserted by a physician. The catheter tip is ideally located in the junction between the superior vena cava (SVC) and right atrium. Confirmation of tip placement by x-ray or fluoroscopy is done at time of catheter insertion.
- An IVAD may be used immediately following insertion.
- IVADs are usually removed by a physician when -
  - Therapy is completed
  - The catheter is malpositioned (e.g. pinch-off syndrome)
  - The tip is no longer within the SVC
  - The catheter is damaged
  - The patient has developed a catheter-related infection

**Documentation and Reporting:*****Type of IVAD:***

- The first nurse, prior to access of an IVAD is responsible for documenting the following on the ALERT form in the patient record:
  - Date of insertion
  - Type of device
  - Valved, or non-valved
  - Need for heparin
  - The source of the information (i.e. operative report or the patient's wallet card)

***Documentation of Care:***

- All procedures performed on a IVAD will be documented using the appropriate documentation forms and should include, but is not limited to:
  - Condition of the site, type of dressing and needle is in-situ
  - Procedures and interventions performed
  - For multi-lumen catheters, identify the lumen being referred to
  - Patient response including symptoms, side effects or complications
  - Patient and/or caregiver education

***Patient Safety Learning System (PSLS):***

- The RN should document and report unresolved obstruction, extravasation, air embolism, infection, catheter damage and product defect using the **PSLS**.

**Infection Prevention and Control:**

- Perform hand hygiene per **PHSA Hand Hygiene Policy**.
- Plan nursing care to minimize access of the IVAD in order to reduce the risk of infection. Where possible all procedures, i.e. blood sampling, flushing, IV infusion, and connecting elastomeric infusors, should be done through the \*cap to minimize opening the system.

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- The work surface is cleaned with 70% alcohol or disinfecting towelettes intended for use in health care before preparing supplies for any IVAD procedure.
- **Sterile Aseptic Technique** will be used for all procedures. In sterile aseptic technique, sterile parts may only contact other sterile parts; contact between sterile and non-sterile parts must be avoided. When it is necessary to touch sterile parts, sterile gloves and procedure mask should be used (e.g. Accessing an IVAD).
- **Single unit** packages must be used.
- Femoral insertion site has an increased risk of infection and thrombosis. It is therefore not recommended.

### ***Skin Preparation:***

- Chlorhexidine Gluconate (CHG) 2% with 70% alcohol is the preferred solution for skin antiseptics, but either 2% CHG or alcohol swabs may be used to cleanse caps\* or tubing connections. Scrub needless connectors for at least 30 seconds and allow to dry for at least 30 seconds.
- For patients with sensitivities to CHG 2% with 70% alcohol, 2% CHG aqueous may be used instead. Allow to dry at least 2 minutes.
- For patients with sensitivities to 2% CHG aqueous, povidone solution may be used: Allow to dry for at least 2 minutes.

### ***Connection Cleansing:***

- To cleanse the connection between any IVAD Huber needle tubing and IV tubing or \*cap use the **3-swab-no-touch technique**:
  1. Grasp connection with one swab
  2. Use second swab to clean from catheter connection up catheter for 10 cm
  3. Use third swab to clean down IV tubing 10 cm. Discard this swab. (Omit this step if catheter is capped)
  4. Cleanse connection site or \*cap vigorously with the first alcohol swab. Discard swab
  5. Do not drop a connection site once it is cleaned
- Do **NOT** apply tape to any IVAD connections or junctions as the adhesive can harbor microorganisms.

### ***Dressings:***

- IVAD post-surgical sutures may be located at the catheter insertion site (neck) and over the subcutaneous pocket where the IVAD is situated (on the chest).

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- Dissolvable sutures are not visible on the skin: you will see a knot only.
- Non-dissolvable sutures/staples are removed 7 days post insertion.
  - If bruising is present, remove suture 14 days after bruising subsides. If patient is on steroids or has had recent radiation therapy to the chest, leave suture until physician orders suture removal (may be up to 4-6 weeks).
- The gauze pressure dressing applied at time of insertion will be removed within 24 - 48 hours and replaced with a Transparent Semi-permeable Membrane (TSM) dressing until site is healed.
- TSM dressings will be used whenever IVAD is accessed, unless IVAD will be de-accessed immediately following procedure and asepsis can be maintained (eg. Blood draw only or IVAD flush only).
- TSM dressings will be changed every 7 days and whenever wet, loose, non-occlusive, blood or drainage is present, or for further assessment if infection or inflammation is suspected.
- Gauze is not routinely used beneath TSM dressings. Gauze dressings may be used for those patients who cannot tolerate an occlusive dressing. Gauze dressings will be changed at least every 48 hours.

### **Infusion Equipment:**

- Any solutions infusing into any IVAD will be changed every 24 hours (unless patient is an outpatient on a continuous infusion).
- All solutions will be infused through a pump. Exceptions: The administration of blood and blood products and when patients can be continually monitored during infusions that do not contain medications.
- All IV tubings will be changed every 96 hours, except for tubing used for intermittent infusions and lipid tubing which will be changed every 24 hours.
- Only Huber point needles will be used to access IVADs.
- A 22 gauge Huber point needle size is the standard for accessing an IVAD.
- Blood and blood products may be infused through a 22 gauge needle as long as the ordered rate is able to be maintained; otherwise a 19 or 20 gauge needle is indicated.
- A PAS-Port® should be accessed with a Huber point needle no larger than 20 gauge.
- A Huber-point needle and attached tubing in an IVAD will be changed every 7 days.

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- The neutral displacement needless connector (\*cap) creates a closed intravenous system, will remain attached to the IVAD at all times unless unblocking a non-functioning line or when an infusion will last 12 hours or less and the line will not be repeatedly accessed for other purposes (e.g. blood sampling). The \*cap should be discarded and replaced with a new \*cap in the following circumstances:
  - routine \*cap change at least every 7 days
  - the \*cap is removed for any reason
  - blood or debris within the \*cap
  - \*cap septum shows poor integrity from multiple use, cracks, leaks or other defects
  - replacement of positive or negative displacement cap

### Preventing Air Embolism:

- Luer-lock IV equipment will be used for **all** IVADs.
- Extension tubings will be clamped at all times when an IVAD is not in use.
- Never use metal forceps to loosen a tight connection. Doing so may crack the connection putting the patient at risk for a damaged IVAD, air embolism, and infection.

### Maintaining Patency:

- All IVADs will be flushed with 20 mL Normal Saline:
  - prior to each use to assess IVAD function
  - after each use (blood draw or infusion) to clear the catheter of blood, and to prevent contact between incompatible medications
  - in conjunction with weekly \*cap, needle and dressing changes for continuous or intermittent infusions where the IVAD is left accessed.
- For **Valved** IVADs, each lumen will be flushed with 20ml Normal Saline **at least** every 4 weeks.
- For **Non-valved** IVADS, each lumen will be flushed with 20ml Normal Saline followed by 5ml Heparin (10U/ml) lock **at least** every 4 weeks.
- Flush using a **pulsatile technique**. This technique helps remove built-up residue, medication, and fibrin from the walls of the catheter.
- **Positive pressure technique** is used to prevent back flow of blood into the tip of the catheter and subsequent clot formation. This is achieved by:
  - Clamping the non-valved catheter Huber extension set while still injecting the last 0.5ml of flush or lock solution, **or**
  - For valved catheters, keeping slight pressure on the plunger before disconnecting the Normal Saline syringe.

- To prevent rupture **NEVER** use excessive force when flushing. The smallest sized syringe that is safe for **DIRECT** connection is a 10ml syringe.

**NB:** For side arm administration of low volume biohazardous drugs, refer to C-252.

### IVAD Damage:

Catheter damage increases the risk for catheter fracture and embolization, air emboli, extravasation, bleeding, occlusion and infection.

- Signs of potential IVAD damage include:
  - Leaking or wetness under the dressing during infusion or flushing
  - If the damage is under the skin, there may be swelling or complaints of pain, discomfort or “fullness” surrounding IVAD hub or along tunneled track.
- **Immediately** upon discovery of potential IVAD damage:
  - Stop infusion and clamp line. Clamp between patient and leaking tubing if applicable. Change needle with extension tubing if damaged.
  - If not related to needle set, label the damaged line with “DO NOT USE”
  - Notify the physician
  - The goal to reinsert a new IVAD should be a collaborative decision among physician, nurse and patient based on patient factors and need for ongoing central vascular access.

### PROCEDURES:

#### Accessing and Flushing an IVAD -

##### Supplies:

- Surface disinfectant
- Sterile gloves
- Procedure mask
- 10 x 14 cm Sterile TSM (if keeping needle in for other procedures)
- 2 swabsticks (2% CHG in 70% alcohol)
- Dressing tray (optional)
- For each lumen:
  - Huber needle with extension tubing
  - 1 x 20 ml syringe of Normal Saline
  - 1 x 10 ml syringe of 5 mL Heparin (10 units/mL) (if needed, for non-valved IVADs only)
  - \*cap (if needed)

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\*cap = Neutral Displacement Needleless Connector



**Procedure:**

1. Clean work surface.
2. Don procedure mask.
3. Assess the site for redness, tenderness, swelling, erosion and drainage. Notify the physician if infection, inflammation or dislodgement is suspected.
4. Create sterile field with either dressing tray **or** sterile glove wrappers. Add sterile supplies to field.
5. Perform hand hygiene. Don sterile gloves.
6. Starting with skin over septum working outwards, clean skin using **gentle friction**, back and forth motion. Cleanse for at least 30 seconds and ensure that the prepped site will be the size of the dressing (approximately a 10cm radius). Each time you return to the skin over the septum, flip to unused side of the swabstick. Allow to air dry completely.

***Rationale for Friction Rub Technique:** The application of friction allows the solution to penetrate the lower layers of the epidermis thus killing a greater number of skin organisms.*

7. Using sterile technique, attach a \*cap to the Huber needle set first and prime with Normal Saline through the cap\* to remove all air.
8. Clamp extension tubing. Leave syringe attached and place assembled unit on sterile field created by sterile glove wrapper.
9. Locate septum of device by palpation and ensure selected Huber needle length is appropriate.
10. With dominant hand, pick up Huber needle with attached syringe, and remove needle cover.
11. Stabilize IVAD with thumb and index finger of non-dominant hand.
12. Insert Huber point needle at 90 degree angle through the skin into the septum (do not rock or tilt needle). Apply moderate pressure until needle comes into contact with metal backing of device. A correct needle length will have the base of the needle flush with the skin **AND** in contact with the back of device.
13. Unclamp and aspirate for brisk blood return to confirm patency. Start flushing with Normal Saline noting any resistance to flow. Assess for swelling or leakage around device and tubing. If unable to aspirate blood or flush:
  - Assess for correct needle placement by ascertaining that needle is in contact with metal backing of device.
  - If unable to determine correct needle placement, remove needle and repeat from step 1.

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- Try again to aspirate blood and flush. If successful go to step 15. If unsuccessful go to the **Standard Trouble-Shooting Process**.
  - If swelling or leakage occurs, **STOP INJECTION and** contact physician immediately.
14. Finish flushing with Normal Saline using pulsatile and positive pressure technique.
  15. If extension tubing is capped, remove saline syringe and discard. If not capped, leave syringe in place.
  16. Ensure Huber needle and extension tubing are well secured by TSM dressing to prevent dislodgement of needle which may potentially cause extravasation.
  17. For non-valved IVADs only, inject Heparin flush solution through \*cap using positive pressure technique. Discard syringe. Omit this step if continuing to other procedures.
  18. Proceed to next procedure.

### Initiating an Infusion -

#### Supplies:

- Surface disinfectant
- Non-sterile gloves
- Alcohol or 2% CHG in 70% alcohol swabs
- 1 x 20 ml syringe of Normal Saline
- Primed IV tubing

#### Procedure:

1. Clean work surface. Perform hand hygiene. Don gloves.
2. Cleanse \*cap surface (if \*cap present) with antiseptic swab, allow to dry.
3. Confirm IVAD patency with 20 mL Normal Saline syringe, if not already done. Clamp line.
4. Connect primed IV tubing to \*cap. If no \*cap present, disconnect saline syringe and connect IV tubing directly to hub of the IVAD extension tubing.
5. Initiate infusion. Ensure that the solution flows to gravity, and that there is no swelling around IVAD.
6. Adjust IV or program infusion pump as ordered.
7. Ensure tubing is well secured to patient's chest, gown or clothing to prevent needle dislodgement.

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8. Remove gloves and perform hand hygiene.

### Completing an Infusion -

#### Supplies:

- Surface disinfectant
- Non-sterile gloves
- 3 alcohol or 2% CHG in 70% alcohol swabs
- 1 x 20 ml syringe Normal Saline
- 1 x 10 ml syringe of 5 mL Heparin (10 units/mL) (for **non-valved** IVADs only)

#### Procedure:

1. Clean work surface. Perform hand hygiene. Don gloves.
2. Cleanse the connection between the IVAD and IV tubing (or the IV tubing and \*cap if present) using the **3-swab-no-touch technique**.
3. Disconnect the tubing (from the cap\* if present), attach syringe of Normal Saline and flush IVAD using pulsatile and positive pressure technique.
4. For non-valved IVADs only, inject Heparin flush solution through \*cap using positive pressure technique.
5. **If leaving the IVAD accessed** for further procedures, remove syringe, secure extension set with tape, remove gloves and perform hand hygiene.
6. Proceed to next procedure.

### Drawing Blood Specimens -

#### Supplies:

- Surface disinfectant
- Non-sterile gloves
- 1-4 Alcohol or 2% CHG in 70% alcohol swabs
- 2 x 20 ml syringes Normal Saline
- Vacutainer or needleless blood transfer device if using syringe method.
- Appropriate blood collection tubes or 10 mL syringes if using Syringe Method
- 1 x 6 mL tube for discard
- 1 x 10 ml syringe of 5 mL Heparin (10 units/mL) (for non-valved IVADs only)
- \*cap (if need to change it)
- Sterile dead-end cap (if capping an infusion)

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**Procedure:**

1. Clean work surface. Perform hand hygiene. Don gloves.
2. Ensure all IVAD lumens are clamped (if clamps are present) and infusions are stopped prior to obtaining blood samples. Where an IVAD has multiple lumens, the blood should be drawn from the larger / distal lumen, Exception: single lumen catheter being used exclusively for TPN, in this case blood work should be collected peripherally.
3. If no infusion is present, **proceed to step 6**. If an IV infusion is present, **proceed to steps 4**.
4. Cleanse the connection between the IVAD \*cap and IV tubing using the **3-swab no-touch technique**.
5. Disconnect the tubing from the \*cap; place a dead-end cap on the IV tubing if it will be re-attached.
6. Cleanse \*cap surface with antiseptic swab, allow to dry. Attach syringe of Normal Saline to IVAD \*cap. Flush IVAD with 20 mls Normal Saline to prevent contamination of sample with infusate. Option: Pull back on plunger to obtain 5-6 mls of blood for discard sample. Discard Saline syringe.

**EXCEPTION:** Prior to drawing **blood cultures**, **do NOT flush the IVAD or discard** the first draw as this sample is used for culture. Therefore cultures should be drawn **first** before drawing other blood specimens (draw aerobic sample 1<sup>st</sup>).

7. Luer lock the vacutainer onto \*cap.
8. Obtain discard sample (UNLESS drawing blood cultures, or previously drawn by syringe). Press tube (5-6 mL) onto vacutainer needle, open clamp if clamp present, and allow tube to fill.

**NB:** If tube does not fill, proceed with **Standard Trouble Shooting Process**, **may need to draw blood by Syringe Method**.

9. Clamp tubing if clamps present. Remove tube and discard.
10. Repeat until all desired blood samples are obtained, clamping between samples.

**NB:** In order to avoid contamination from substances in collection tubes. Draw the blood specimens in the order recommended by your Regional Laboratory Medicine Guidelines. [VCH-Blood Collection Quick Reference Guide](#)

11. Remove vacutainer and discard.
12. Connect syringe of Normal Saline to \*cap, flush briskly using pulsatile and positive pressure techniques.

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13. Disconnect syringe from \*cap, and discard.
14. For non-valved IVADs only, inject Heparin lock solution through \*cap finishing with positive pressure technique. Discard syringe.
15. Go to next procedure, or remove gloves and perform hand hygiene.

### **Drawing Blood by Syringe Method - continuing from step 6 above**

7. Attach a 10 mL syringe or larger, open clamp and pull back syringe plunger slowly. For valved catheters pause for a few seconds to allow the valve to open. Gently aspirate 5-6 mL blood for discard (no discard for cultures).
8. Clamp tubing. Remove and discard syringe.
9. Attach another syringe(s) and collect enough blood for needed samples, clamping between syringes.
10. Connect syringe of Normal Saline to \*cap, flush briskly using pulsatile and positive pressure techniques.
11. Transfer blood to appropriate tubes using a needleless blood transfer device.
12. Disconnect syringe from \*cap, and discard.
13. For non-valved IVADs only, inject Heparin lock solution through \*cap finishing with positive pressure technique. Discard syringe.
14. Go to next procedure, or remove gloves and perform hand hygiene.

### **De-Accessing and IVAD -**

#### **Supplies:**

- Surface disinfectant
- Non-sterile gloves
- Sterile gauze
- Band-aid or tape

#### **Procedure:**

1. Clean work surface. Perform hand hygiene, don gloves.
2. Remove TSM dressing by pulling in a gentle motion, parallel to skin, towards the needle, without dislodging IVAD needle. Discard dressing. Note any drainage, redness or swelling.

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3. Stabilize the IVAD using thumb and forefinger of non-dominant hand.
4. Grasp needle with dominant hand; remove needle, engaging the safety mechanism. Discard into sharps container.
5. Apply slight pressure over site with sterile gauze. Apply dry dressing/band aid if bleeding persists.
6. Remove gloves and perform hand hygiene.

## MANAGEMENT OF POTENTIAL IVAD OCCLUSION - PARTIAL AND COMPLETE:

### Standard Trouble-Shooting Process -

**NB:** *If issues with repeated occlusion, consider increasing flushing frequency, based on nursing assessment and patient factors. Discuss with physician.*

### If unable to aspirate blood from Single or Multilumen IVADs:

1. Check tubing and catheter for closed clamps, kinks and areas of constriction.
2. Have patient take a deep breath, cough, raise and lower arms and change position (e.g. lie supine). Try again to aspirate blood.
3. If unsuccessful, remove the \*cap and directly connect the Normal Saline syringe to the hub of the IVAD; re-attempt flushing.
4. If still unable to draw blood, re-access device with 19G needle, repeat step 2.
5. Attempt to flush catheter with 20 mL Normal Saline and then aspirate using push-pull method. Repeat step 2.
6. At this point, determine if the line has a partial or complete occlusion.

### **Partial Occlusion:**

- The line is partially occluded if you have applied the Standard Trouble-Shooting Process and can flush with Normal Saline without any difficulty, but are still unable to aspirate blood **OR** you can aspirate blood, but the line does not flush briskly (sluggish).
- If a lumen appears to be sluggish it is recommended the lumen be treated.

### **Complete Occlusion:**

- The line is completely occluded if you have applied the Standard Trouble-Shooting Process and but can **neither infuse fluids nor aspirate blood**.
- If there is resistance to injection, STOP. To prevent rupture NEVER use excessive force when attempting to flush IVADs.

### **Occlusion in Multilumen IVAD:**

- Patent lumens can be used to infuse any type of medications; vasopressors, antineoplastics, etc.
- If more than one lumen is occluded, it is recommend that one lumen at a time be treated and cleared.

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## Management of Occluded IVADs with Alteplase -

**IVADs occluded for >24 hours increase the patient's risk of infection. Treat blocked IVADs AS SOON AS POSSIBLE.**

- \*Cap IVAD and obtain order for thrombolytic Alteplase: 2 mg Alteplase in 2 mL for each occluded lumen; repeat x 1 if needed. Maximum dose is 4 mg/day.

### Supplies:

- Surface disinfectant wipe
- Non-sterile gloves
- Alcohol or 2% CHG in 70% alcohol swabs
- For each occluded lumen:
  - 1 x 20 ml syringe Normal Saline
  - 2 mg Alteplase in 2 mL (in a 10 mL syringe)
  - \* cap.

### Procedure:

1. Clean work surface. Perform hand hygiene and don gloves.
2. Scrub surface of \*cap with cleansing swab. Or scrub connection and remove \*cap if suspected factor in occlusion.
3. Attach 20 ml syringe Normal Saline.
4. Pull back on syringe to assess for blood return.
5. If blood return **is** spontaneous, there is no need for Alteplase – carry on with procedures.
6. If blood return **is not** spontaneous, clamp IVAD, remove syringe, and initiate Alteplase procedure below.
7. Attach 10 mL syringe with 2 mg/2 mL Alteplase.
8. **For partial occlusion** instill 2mg (in 2 mL) Alteplase to IVAD; clamp the line.
9. **For complete occlusion** instill 2 mg (in 2 mL) Alteplase using a gentle push-pull action:
  - Keeping the syringe upright (plunger at the top and IVAD-syringe connection below), pull plunger back by 2 mL and release slowly
  - Repeat several times to let Alteplase reach thrombotic occlusion; clamp the line
  - **Do not** use excessive force to inject Alteplase.
10. Discard syringe and add \*cap if not already present.

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11. Apply label to line "DO NOT USE" with time of instillation (e.g. Alteplase @ 10:00).
12. Allow Alteplase to remain in catheter for **30-120 minutes**.

**NB:** *It is safe for Alteplase to remain in the line for 24-72 hours if check cannot be performed after 120 minutes.*

### **After 30 - 120 Minutes -**

#### **Supplies:**

- Surface disinfectant
- Non-sterile gloves
- For each occluded lumen:
  - 1 x 20 ml syringe Normal Saline
  - 1 x 20 ml syringe Normal Saline (dispose of 10 ml Saline to make room for discard)
  - Alcohol or 2% CHG in 70% alcohol swabs

#### **Procedure:**

13. Clean work surface. Perform hand hygiene and don gloves.
14. Scrub \*cap with cleansing swab.
15. Attach 20 ml syringe of 10 mls Normal Saline.
16. Pull back on syringe to assess for blood return.
17. If blood return **is spontaneous**, withdraw 5 mL blood and discard. Use 2<sup>nd</sup> saline syringe to flush with 20 mL Normal Saline and carry on with other procedures.
18. If blood return is **NOT** spontaneous after 30 minutes, allow the same Alteplase dose to remain in the line the line is still occluded.
19. After a total of 120 minutes Alteplase dwell time **REPEAT steps 13-18**.
20. If blood return is not spontaneous after 120 minutes, obtain 2<sup>nd</sup> syringe of Alteplase and **REPEAT** the Alteplase procedure in its entirety.

**NB:** *If the lumen is still occluded after 2 attempts at using Alteplase, Refer to BCCA ST Policy III-80.*

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**Skin Patch Test -**

- When the skin around the insertion site becomes itchy and/or reddened under the dressing do a patch test on the patient's chest. This will distinguish between sensitivity to alcohol, CHG, **and/or** TSM dressing. Apply:
  - 70% alcohol on one patch
  - aqueous CHG 2% on a 2<sup>nd</sup> patch, and
  - TSM dressing on a 3<sup>rd</sup> patch.
- Check site in 24 hours.
- If the patient is sensitive to alcohol, then switch cleansing solution to aqueous CHG 2%.
- If the patient is sensitive to CHG, change the cleansing solution to povidone iodine.
- If the patient is sensitive to the TSM dressing, change the dressing to alternate TSM. If unable to tolerate any TSM dressings, change to gauze dressing.
- If the skin becomes irritated, cleanse with appropriate agent, apply a no-sting barrier, and make the dressing over the insertion site as small as possible. Consider dressing with gauze.

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\*cap = Neutral Displacement Needleless Connector

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**APPENDIX A:**

**Patient Information Handout  
IMPLANTED VENOUS ACCESS DEVICE (IVAD)**

**Introduction:**

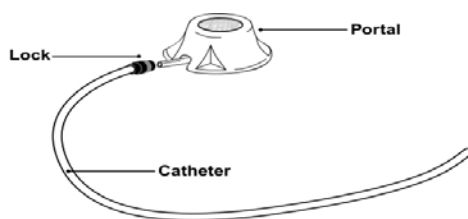
You and your doctor have chosen to have an implanted venous access device (IVAD) inserted based on your treatment. Since the IVAD can be left in place for long periods of time (weeks, months, years) it is important that you are aware of what it is and how to take care of it. The IVAD can be used to receive IV therapy (i.e. chemotherapy), take blood work, and in some cases receive contrast dye when having a scan procedure. The IVAD is meant to provide safe access for your treatment and prevent repeated needle sticks to your hand and arm veins.

**What is an IVAD?**

Other names for an IVAD are port, port-a-cath, and power port

The IVAD is a small device or disk placed completely beneath your skin and is made up of three parts:

- A small port chamber (portal) that is made from a self-sealing rubber material.
- A catheter or small flexible tube that is connected to the chamber at one end placed in the large blood vessel which delivers blood to your heart.
- A lock that connects the port to the catheter tubing.

**How is the IVAD inserted?**

A surgeon or radiologist will insert the IVAD during a brief procedure that can be performed under local anesthetic or with general anesthetic. You will go to the operating room or diagnostic imaging (X-ray) department for the procedure.

Depending on the type of treatment and the purpose of the device, the IVAD may be located in your chest, arm, abdomen or other location as indicated by the doctor.

An incision is made where the IVAD is to be placed and the catheter is inserted into your vein which leads to a larger vein connected to your heart. After the IVAD is placed, a small pocket is made under the skin, this is where the IVAD is placed and sutured to underlying tissues to secure it. All incisions are sutured closed and dressings are applied. An x-ray is taken to make sure the catheter is in the proper place.

**How long does the Procedure take?**

It normally takes about 45 minutes to 1 hour to complete.

**What happens after the device has been inserted?**

If the procedure is being done as an outpatient you will be observed in the post anesthetic room or recovery room for approximately one hour. If you have stitches they will be removed between 7-14 days after insertion. Sometimes the surgeon will use

\*cap = Neutral Displacement Needleless Connector

stitches that are absorbed by your body and they do not need to be removed. You will be informed of the type of stitches you have.

You will have a dry gauze dressing where the port was placed and it is normal to see a small amount of bloody drainage on the dressing.

### **Will I have pain following the Procedure?**

Some discomfort immediately following surgery is expected; it is often described as a stiff neck or bruised feeling. The discomfort usually lasts no more than 4-7 days. You will be instructed on what pain medications to take at home, if needed.

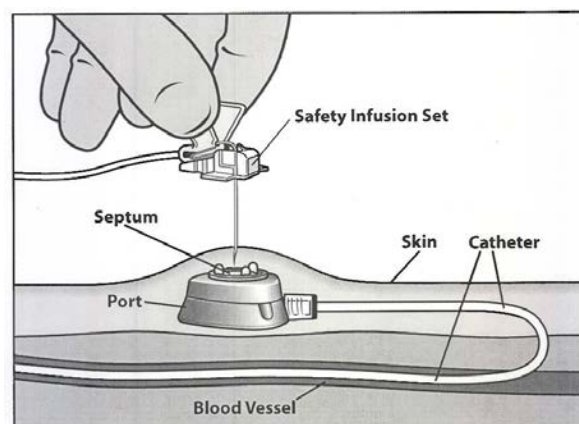
If you experience pain at the insertion site it is a good idea to take pain medications. This medication works best if it is taken when you first notice any discomfort and taken regularly as prescribed during the first 1-2 days. If your pain is not controlled by this medication, contact the physician for further instructions.

If you experience any of the following problems at home please call \_\_\_\_\_ or 911 or go to your closest emergency.

- Difficulty breathing
- Chest pain other than at the incision site(s)
- Fever/ chills
- Continuous nausea and vomiting
- Increased drainage from the incision site(s)
- Increase pain, swelling or warmth at the incision site(s).

### **How is the IVAD used?**

The IVAD can be used like a regular intravenous (IV). A special needle called a Huber needle is inserted through the skin in the rubber septum of the device. When the needle goes through the skin you may feel some pressure or slight pricking sensation, most people find the sensation decreases over time. If you find it uncomfortable you can use relaxation, breathing out as the needle is inserted or skin numbing agents can be considered. Collection of blood samples, giving fluids, some medications, chemotherapy and sometimes contrast dyes can be done through your IVAD. The Huber needle can stay in for up to 7 days if necessary.



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A dressing will be applied if you are going to go home with the needle in place. If you notice any irritation from the dressing, inform your nurse, as other dressings can be used.

**Routine Care of the IVAD:**

The IVAD must be flushed with a special solution following use or every 4 weeks. If you are not receiving treatment for a period of time, be sure to make arrangements to have your IVAD flushed regularly. Your nurse can provide you with the information you need to get this done.

**Common Questions -****Can I bathe or swim?**

You can bathe after the IVAD is inserted. Be sure to keep the dressings covered and dry and once they are removed you can get the area wet. You should wait until the stitches are removed and the incision is healed before swimming. Your nurse or doctor will be able to give you specific information.

**Will the IVAD affect my normal daily activities?**

Try to avoid strenuous activities or heavy lifting for the first few days after the IVAD insertion. Once your incision has healed, you should be able to return to your normal daily activities.

**Can you see the IVAD?**

The IVAD is placed under the skin but you may be able to see its shape or feel it with your fingers.

**How long can the IVAD stay in place?**

The IVAD is designed to stay in place for a long time, depending on individual situations and general health. Some people have had an IVAD for years without any problems. Your physician can discuss this further.

**Will having the IVAD affect my sex life?**

Having the IVAD in place will not interfere with your ability to be intimate with your partner. Please discuss any concerns with your nurse or doctor.

**If I forget to flush my IVAD monthly what should I do?**

You should make an appointment to have your IVAD flushed as soon as possible. Contact your cancer centre to help you with IVAD flushes.

**What happens if I no longer need the IVAD?**

In discussion with your doctor, it may be decided that you no longer need the IVAD. If so; it can be removed in a procedure similar to the one used to place the device initially.

## What problems should I look out for?

The following is a list of possible problems which may occur with your IVAD and some recommended solutions.

Problem	What you will see or feel	What to do	How to avoid it
<b>INFECTION</b>	You may have: <ul style="list-style-type: none"> <li>• fever or chills</li> <li>• temperature above 38° C (101° F)</li> <li>• flu-like feeling, lack of energy</li> <li>• redness, swelling and / or drainage at incision</li> </ul>	<ul style="list-style-type: none"> <li>• Phone doctor or emergency numbers provided:</li> <li>• antibiotics or other treatments may be ordered</li> </ul>	<ul style="list-style-type: none"> <li>• Wash hands prior to beginning any IVAD care</li> <li>• Follow instructions for clean technique if discontinuing treatment at home</li> </ul>
<b>LOOSE OR DISLODGED NEEDLE</b>	<ul style="list-style-type: none"> <li>• the needle will be completely or partially out of the device</li> <li>• your infusion device, or pump, may stop infusing</li> </ul>	<ul style="list-style-type: none"> <li>• the needle may need to be changed or the device flushed</li> </ul>	<ul style="list-style-type: none"> <li>• check needle is secure and in IVAD</li> </ul>
<b>THROMBO-EMBOLISM</b> (breaking off of a blood clot from inside the device)	you may have: <ul style="list-style-type: none"> <li>• shortness of breath</li> <li>• Severe pain under your collarbone that does not go away</li> <li>• dizziness or confusion</li> </ul>	<ul style="list-style-type: none"> <li>• this is an <b>emergency</b></li> <li>• lie down on your <b>left</b> side</li> <li>• call an ambulance (911) and go to the nearest Emergency Department</li> </ul>	<ul style="list-style-type: none"> <li>• Make sure your device is flushed with saline and heparin every 28 days</li> <li>• Do not use force flush, Flush device at least once a month</li> </ul>