

Venous Access

- Venous access is crucial for administration of chemotherapy and supportive care in children. Peripheral IV's may be used but many of the chemotherapy drugs and antibiotics cause sclerosis of the veins and ultimately lack of venous access
- Only nurses certified and familiar with central line care should access central lines using the BCCH Guidelines

Central line care

Insertion and Removal

It is recommended that Central Venous Access Devices (CVADs) either cuffed central venous catheters (CCVCs) or Implanted Vascular Access Devices (IVADs) be inserted and removed at BCCH.

Prevention of infection

The following have been shown to reduce the risk of catheter related infections:

- Personnel (nurses) trained in central line care
- Hand washing prior to accessing lines
- Aseptic technique when accessing lines
- Chlorhexidine prep and dressing

Reference

Garland JS, Henrickson K, Maki DG. The 2002 Hospital Infection Control Practices Advisory Committee Centers for Disease Control and Prevention guideline for prevention of intravascular device-related infection. Pediatrics Nov 2002;110(5) 1009-13

Central Line Reference Guide

What?	How?	When?	Why?
Dressing Change	<ul style="list-style-type: none"> ~ Use of a semipermeable polyurethane dressing (Tegaderm or Op-cite 3000) is recommended, but gauze dressing may be used if patient unable to tolerate others. ~ Coiling of catheter under dressing is strongly recommended to prevent catheter dislodgement. 	<ul style="list-style-type: none"> ~ CVCs : 7 days post insertion then weekly and prn ~ VADs : q10 days with Huber needle change and prn **If gauze dressing used, change every 3 days. 	<ul style="list-style-type: none"> ~ To prevent dislodging of the catheter until insertion site is healed ~ To cleanse and assess exit site
Cap Change	<ul style="list-style-type: none"> ~ Aseptic procedure 	<ul style="list-style-type: none"> ~ Weekly and prn when heparin locked ~ q 72 hours with tubing change ~ q 24 hours if infusing lipids or blood products 	<ul style="list-style-type: none"> ~ To reduce risk of infection
Blood sampling	<ul style="list-style-type: none"> ~ Aseptic procedure using vacutainer or syringe method 	<ul style="list-style-type: none"> ~ As ordered but try to limit number of times lines are accessed ~ IVADs are not routinely accessed solely for the purpose of blood sampling 	<ul style="list-style-type: none"> ~ To reduce risk of introducing bacteria

What?	How?	When?	Why?
Saline flushing	<ul style="list-style-type: none"> ~ Use a 10 ml syringe when flushing a Central Line 	<ul style="list-style-type: none"> ~ After blood sampling or following bolus chemotherapy injection ~ When converting from continuous to locked system ~ Before initially connecting to the IV line ~ prn 	<ul style="list-style-type: none"> ~ To flush blood, chemo, etc through the line
Heparin locking	<ul style="list-style-type: none"> ~ Use a 10 ml syringe when flushing a Central Line ~ Pressure of fluids through a central line must not exceed 40 psi (2068 mm hg); use of a syringe smaller than 10 mls should be avoided for flushing as it may rupture the line ~ Heparin lock solution 2.5 cc of 10 U/ml 	<ul style="list-style-type: none"> ~ CCVCs: twice a week and prn ~ IVADs: monthly 	<ul style="list-style-type: none"> ~ To prevent intraluminal thrombotic events
IV tubing change	<ul style="list-style-type: none"> ~ Aseptic procedure 	<ul style="list-style-type: none"> ~ q72 hours and prn ~ q4 hours if used for blood or blood products ~ q24 hours (TPN, Insulin) 	<ul style="list-style-type: none"> ~ To prevent bacterial growth in IV tubing

Chlorhexidine Gluconate has been shown to be superior to iodophors for preventing colonization of IV devices and IVD-related blood stream infections

Implanted Venous Access Devices (IVAD)

Who may access

A registered nurse who has completed the Central Line Education Program, and who has demonstrated competency in accessing an IVAD to the clinical educator or designate, may access an IVAD.

Indications for access

- Monthly Heparin locking
- IV Chemotherapy
- IV Access

It is **not** recommended the IVADs be accessed for routine blood work unless due for monthly Heparin locking.

Method of access

- Sterile technique
- Wash hands and prepare equipment
- Glove
- Sterilize skin:
 - Use chlorhexidine/alcohol swabsticks or Povidone-Iodine if chlorhexidine not available
 - ~ Cleanse a 5-7 cm area over IVAD septum using gentle friction in a back and forth motion.
 - ~ Repeat using a new swabstick
 - ~ Cleanse the area using a 3rd swabstick in a circular motion starting in the center and moving outward to cover 5-7 cm radius
 - ~ Allow chlorhexidine/alcohol to dry for at least one minute
- Drape patient
- Stabilize the IVAD with thumb and fingers
- Insert Huber needle at 90° angle through skin, into the septum of the device until the needle contacts the base. Do not twist or rock the needle once inserted
- Proceed with blood sampling, flushing, heparin locking, chemotherapy administration or connect to IV infusion as required
- Apply dressing over insertion site and secure tubing

Method of De-accessing

- Ensure device has been heparin locked
- To de-access, remove dressing, stabilize device with thumb and fingers, remove Huber needle by pulling straight up and out
- Apply pressure to puncture site if any bleeding
- A bandaid may be applied prn

Cuffed Central Venous Catheters

Who may access:

- A registered nurse who has completed the Central Line Education Program, and who has demonstrated competency in related skills to the clinical educator or designate, may access a Cuffed Central Venous Catheter
- Patient or family member who has been taught how to do the following skills: dressing change, cap change, heparin locking

Indications for access

- Heparin locking
- Chemotherapy administration
- IV Access
- Blood sampling
- Cap change
- Dressing change
- Hemodynamic monitoring (CVP monitoring)

Dressing Change:

- Wash hands and prepare equipment
- Remove old dressing and inspect site for any signs of infection
- Using chlorhexidine/alcohol swab, clean catheter from exit site away from patient
- Place drape under cleaned catheter
- Using chlorhexidine/alcohol swabsticks, clean around catheter exit site applying gentle friction in a back and forth motion covering a 5 cm radius around exit site. Repeat with 2 more swabsticks
- Allow chlorhexidine/alcohol to dry for at least one minute
- Coil catheter and apply transparent dressing covering exit site and coiled catheter
- Secure catheter below dressing using waterproof tape or catheter securement device
- It is strongly recommended that the catheter be further secured using a tape tab and pinning through the tab to the patient's undergarments.

Blood Sampling, flushing and heparin locking a CCVC or IVAD

- Wash hands and prepare equipment
- If double lumen and second lumen has infusion running, clamp 2nd lumen and place infusion on hold
- Using chlorhexidine/alcohol swabs cleanse injection port for one minute. With second swab, cleanse from port up line toward patient. Allow chlorhexidine/alcohol to dry for at least one minute
- Using a vacutainer or syringe method remove and discard 3.0 ml of blood
- Obtain samples as required, clamp tubing, remove syringe or vacutainer
- Flush with NS: Attach syringe with 10 ml NS and flush by giving 2 quick pushes (to create turbulence), then with continuous motion, flush catheter with 9 ml NS (If IVAD, repeat with 2nd syringe for total of 18 mls)
Note: It is necessary to create positive pressure when flushing the tubing to prevent backflow of blood into catheter. This is accomplished by clamping the tubing while flushing. If using a positive displacement cap, do not clamp tubing until after removal of syringes
- After flushing with NS, either connect tubing to infusion and administer chemotherapy, or heparin lock device using a 10 ml syringe with 3 ml Heparin lock solution 10 U/ml. Flush device with 2.5 ml solution using same technique as for saline flush above

Reference

Patient teaching pamphlets from the [Family Resource Library](#) (Look under "C" for CCVC and "V" for IVAD)

Complications of central lines: nursing/medical aspects

Consult Pediatric Oncologist for the following prior to initiating treatment:

Complication	Investigation	Treatment
Broken line CCVC	~ Chest x-ray	~ Clamp above the break using bulldog clamp ~ Contact IV team @ Children's hospital for permanent repair
Broken line IVAD	~ Chest x-ray	
Infection – local (site/tunnel)	~ Culture site and line	~ Start Vancomycin. If neutropenic, add empiric protocol
Infection – line (fever & rigors when line accessed)	~ Culture line ~ Complete blood count	~ Start Vancomycin +/- Vancomycin lock. If neutropenic, add empiric antibiotic protocol
Infiltration/Extravasation	~ Access line for patency by aspirating for blood return and flushing with NS	~ Follow BC cancer drug manual or hospital policy for management of infiltration or extravasation of a vesicant or irritant agent £ Refer to Appendix 2 of the BC Cancer Drug Manual
Blocked line – no blood return or unable to flush	~ Chest x-ray	~ Instill alteplase cathflo as per hospital policy † Refer to Page 251 of BCCH 2006/2007 Pediatric Drug Dosage Guidelines

References:

£ [BC Cancer Drug Manual – Appendix 2](#)

† [BCCH 2006/2007 Pediatric Drug Dosage Guidelines](#) – can be purchased from CW Bookstore