

	<p>Policies & Procedures</p> <p>Title: CENTRAL VENOUS CATHETERS – BLOOD WITHDRAWAL (PICC, SHORT TERM, TUNNELED, IMPLANTED)</p> <p>LPN Additional Competency (LPNAC) Central Venous Catheters - Blood Withdrawal from PICC with an Established Plan of Care</p> <p>RN Entry Level Competency</p> <p>I.D. Number: 1042</p>
<p>Authorization: [x] Former SktnHR Nursing Practice Committee</p>	<p>Source: Nursing</p> <p>Date Reaffirmed: July 2018 update Appendix A</p> <p>Date Reaffirmed: February 2018 (update of LPN and GLPN role language)</p> <p>Date Effective: January 2017</p> <p>Scope: Former SktnHR & Affiliates</p>

Any PRINTED version of this document is only accurate up to the date of printing 13-Aug-18. The former Saskatoon Health Region (SKtnHR) cannot guarantee the currency or accuracy of any printed policy. Always refer to the Policie and Procedures site for the most current versions of documents in effect. SHR accepts no responsibility for use of this material by any person or organization not associated with SKtnHR. No part of this document may be reproduced in any form for publication without permission of SKtnHR.

PREAMBLE

Best practice in blood collection from vascular access devices will improve laboratory test result accuracy, increase client safety and decrease time lost to re-draws. Between 70 and 85% of all clinical decisions are based on laboratory results; studies have shown that 68% of all specimen errors occur in the preanalytical phase – before the blood is analyzed in the lab. A specimen which is an accurate reflection of the client’s “in vivo” status should be the goal every time blood is drawn.

DEFINITION

Client- a term used to describe a client, patient or resident

Central Venous Catheters (CVC): A venous access device whose tip dwells in the superior or inferior vena cava

Established Plan of Care - the plan of care for blood withdrawal from a PICC may be considered established when the patient’s PICC has been previously accessed for blood withdrawal, and is known to be patent and uncomplicated. The plan of care must be documented in a nursing care plan. The plan of care is no longer established if the patient has signs or symptoms of PICC infection, occlusion, damage, displacement or other complications.

Implanted Port - access is through a port that is surgically placed in the chest or arm. Note: Accessing Implanted Ports is an RN Specialty Practice (RN Procedure).

Peripherally Inserted Central Catheter (PICC): A central venous access device inserted into a peripheral vein whose tip dwells in the superior vena cava and is used in acute care, long term care or home care.

Short Term (Percutaneous) catheter-inserted into the subclavian, jugular or femoral vein used on a temporary basis for clients in urban acute care only (up to 30 days).

Tunneled (Long Term) tunneled under the skin then inserted into subclavian vein, catheter is used in hospital or home care for long term therapy.

ROLES

Graduate Licensed Practical Nurses (GLPNs) – GLPNs identified by the manager in targeted practice settings, will be certified in the LPNAC: Central Venous Catheters – Blood Withdrawal from PICCs with an Established Plan of Care, to provide care only with the direct supervision of a certified LPN or RN.

Graduate Nurses (GNs) – as assigned, GNs will withdraw blood from PICC, Short Term, Tunneled and Implanted Central Venous Catheters with direct supervision until determined by an RN supervisor to be competent to practice autonomously.

Licensed Practical Nurses (LPNs) – LPNs identified by the manager in targeted practice settings, will be certified in the LPN Addition Competency: Central Venous Catheters - Blood withdrawal from PICCS with an Established Plan of Care, to provide care independently as assigned, for clients who are less complex, more predictable and at lower risk for negative outcomes. If a change is required in the established plan of care, the LPN will consult with a RN and work collaboratively to establish a new plan of care. **Prerequisite:** LPN must have completed SaskPolytechnic IV Therapy/Blood & Blood Products Completer Course or equivalent.

In practice settings which are not targeted, LPNs currently educated or certified may continue to provide care, as assigned, but LPNs or GLPNs requiring initial certification will not be certified until targeting is approved for the practice setting.

Registered Nurses (RNs) – as assigned, RNs will withdraw blood from PICC, Short Term, Tunneled and Implanted Central Venous Catheters.

Registered Psychiatric Nurses (RPNs) - role with CVC Blood Withdrawal is currently under review.

1. PURPOSE

- 1.1 To safely obtain high quality blood specimens for lab testing from central venous catheters.
- 1.2 To minimize the risk of infection, damage, displacement and other complications associated with the use of CVCs.

2. POLICY

2.1 Practitioner Order required

- Blood tests
- A practitioner may request blood is not withdrawn from a CVC for a specific client or indication

2.2 **Special Considerations See related policies**

- Prior to accessing CVCs for any reason, nurses must perform appropriate Hand Hygiene procedures (Infection Prevention & Control policy 20-20)
- To decrease the risk of contamination, accessing CVCs should be kept to a minimum
- Carefully analyze risks versus benefits before deciding to use a CVC for obtaining blood samples. Risks associated with use of a CVC include increased hub manipulation and the potential for intraluminal contamination, alterations in CVC patency, and erroneous lab values associated with adsorption of medications infused through the CVC.
- The continued need for a CVC must be assessed daily
- When flushing CVCs a 10mL syringe or larger must be used to avoid excessive pressure, to avoid possible rupture of the catheter or dislodgement of a clot
- Practitioner must be notified immediately and will consult Medical Imaging if unable to flush or withdraw blood from any lumen
- To prevent PICC or peripheral implanted port occlusion and/or damage, use of that arm for BPs or venipuncture must be avoided

2.3 **Accessing a CVC**

- Needleless adapters must be scrubbed for 15 seconds using an alcohol swab and friction in a twisting motion prior to accessing (let dry)
- For accessing an Implanted Port see Policy : Central Venous Catheters-Implanted Ports- accessing and discontinuing access

2.4 **Flushing and locking CVCs *See related policies**

- Flush all CVC lumens: (PICC, Short Term, Tunneled and Implanted) **with 0.9% Sodium Chloride** after blood withdrawal,
- Use stop & start flush technique
- **See Adult/Pediatric/PICU Standards (Appendix A,B & C) for volumes**

2.5 **Lock the following with: Heparin flush (100u/mL)**

- **Adults:** all tunneled (Long Term) and Implanted Ports
- **Pediatrics:** all Short Term, Tunneled (Long Term) and Implanted ports
- See Adult/Ped Standards (Appendix A,B & C) for amounts of flush
- Note: Heparin requires an Independent double check prior to use
- Acute Care Pediatrics, PICU and NICU follow unit protocols for flushing CVCs some exceptions apply, see specific physician order

2.6 **Blood Withdrawal**

- Nurses must practice careful adherence to laboratory standards to maintain the integrity of blood specimens
- Reference must be made to the current **Laboratory Blood Specimen Tube Type Collection Chart** posted on each unit or on the Laboratory Medicine website for correct order of draw and tube choice.
- Blood may be withdrawn from any lumen except one that is dedicated to parenteral nutrition or drugs for which levels must be drawn. (Acute Care Peds: this may be required for single lumen CVCs)

Note: CVC withdrawal of blood for testing levels of some drugs must not be performed.
Consult with Laboratory Medicine.

- Vacutainer or syringe method may be used.
- Needleless connector should be changed prior to withdrawing blood for blood cultures
- A volume of blood must be discarded before drawing blood specimens from a CVC. (refer to CVC Adult or Pediatric Standards Appendix A & B)
- When drawing blood for Blood Culture syringe method will be used; no discard required.

Note: *peripheral blood sampling is preferred for blood cultures.*

- Before drawing blood from a CVC, IV infusions in all lumens must be turned off, preferably for 1-2 minutes (unless this would affect the well-being of the client).
- A blood transfer device must be used to transfer blood to tubes if syringe method used.
- Immediately following blood withdrawal, the lumen must be flushed according to CVC Adult or Pediatric Standards (Appendix A, B & C).

3. PROCEDURES

3.1 Blood Withdrawal

3.1.1 Supplies:

- Current Laboratory Blood Specimen Tube Type Collection Chart
- vacutainer luer – lock access device (if using vacutainer method)
- vacutainer blood transfer device (if using syringe method)
- blood sample tubes (including discard tube for vacutainer method)
- 6 or 12 mL syringes, if using syringe method (label one as discard)
- blood cultures: culture vials if needed
- clean gloves
- alcohol swabs
- bleach swabs (some units opt to use Percept solution with a cotton-tipped applicator to clean the tops of blood tubes after filling)
- cotton tipped applicators (if required)
- plastic bags
- blue pad
- requisitions and labels
- refer to CVC Adult or Pediatric Standards (Appendix A & B) for flushing supplies
- needleless adapter if withdrawing blood for cultures
- Alcohol based hand sanitizer

3.1.2 Turn off IV infusions to all lumens (unless this would affect the well-being of the client). In this case, call Phlebotomy (Laboratory Medicine) and have blood drawn peripherally. Inform phlebotomy of any medications that are infusing and the location of CVCs/IVs.

3.1.3 Perform hand hygiene and apply clean gloves

3.1.4 Scrub needleless adapter or tubing port for 15 seconds using an alcohol swab and friction in a twisting motion. Allow to dry.

- 3.1.5 Withdraw blood for discard using discard tube or syringe. See CVC Adult or Pediatric Standards (Appendix A, B & C) for amount of discard required for each CVC type.
- Exceptions:
 - **blood cultures** – use syringe method only; no discard is required; clean top of blood culture tube with alcohol swab and let dry prior to use; change needless adapter prior to withdrawing blood for blood cultures.
 - PICU and NICU as per unit policies.
- Note:** *If unable to withdraw blood using vacutainer method:*
- reposition client by raising shoulder or asking to cough
 - reposition blood tube and needle
 - try a new blood tube
 - flush with 10 mL 0.9% Sodium Chloride and reattempt vacutainer method
 - change to syringe method
- 3.1.6 Withdraw total blood sample as required attaching tubes in quick succession. See current [Laboratory Blood Specimen Tube Type Collection Chart](#) on your unit for recommended order of withdrawal and tube choice for each test. Slowly invert each tube 5-10 times after filled.
- 3.1.6.1 If using syringe method, pull back on the syringe 1mL until blood can be seen coming into the syringe then continue to gently withdraw blood into syringe. This allows time for the pressure activated valve (if present) to open and helps decrease the risk of hemolization of the sample.
- Note:** *It will take up to 30 seconds to fill a 10 mL syringe.*
- Note:** *Using a smaller syringe for withdrawal generates less force and may produce blood return when a 10 mL syringe doesn't. Less force also prevents hemolysis of the blood specimen. Always use a 10mL syringe for flushing the CVC.*
- 3.1.6.2 Using the blood transfer device, transfer the blood into the tubes. **Do not inject blood into the blood tube.** Allow the vacuum to draw blood from the syringe to avoid damaging specimen.
- Note:** *To achieve a quality specimen, transfer the specimen to the blood tube immediately after withdrawal to ensure the blood mixes with the required tube additive without delay*
- 3.1.7 **Immediately flush line with 0.9% Sodium Chloride, using a stop and start motion to create a turbulent flow to clean the interior of the lumens.**
- 3.1.8 Resume IV infusions if applicable.
- 3.1.9 Clean tops of blood filled specimen tubes with bleach swab or Percept.

- 3.1.10 Immediately after blood collection and at point of care, label all tubes and place them in a plastic bag for transportation to lab with appropriate requisition.
Home Care: transportation of specimens to lab may occur by a family member or nurse who is certified in the transportation of hazardous materials.
- 3.1.11 Remove gloves and perform hand hygiene
- 3.1.12 Documentation:
- Indicate CVC as source of specimen on blood requisition.
 - Record fluid volumes as appropriate (pediatrics) on Fluid Balance Record.

Other related policies:

#1086 - Central Venous Catheters-Short Term, Tunneled, Implanted – Care of

#1001 - Central Venous Catheters – Peripherally Inserted Central Catheters (PICCs) - Care of

#1032 - Central Venous Catheters – Implanted Ports – Accessing and discontinuing Access

4. REFERENCES

Gorski, L., Hadaway, L., Hagel, ME., McGoldrick, M., Orr, M. & Doellman, D. (2016). Infusion Therapy Standards of Practice. Blood Sampling via a Vascular Access Device S87. Infusion Nurses Society. S87-S88. Norwood MA.

Lyon, M. (2014) Hemolysis: Impact of Clinical Laboratory Results. Power Point Presentation to CNEs. ..\..\..\Nursing Practice & Education\Education Resources\PowerPoint Presentations\PPP RELATED TO CLIENT CARE\Hemolysis Dr. Lyon.ppt

Macklin, D. (1999) What's Physics Got to Do with It? A Review of the Physical Principles of Fluid Administration. Journal of Vascular Access Devices. Summer 4(2): 7-11.

Mendez, SJ. (2012). Evidence-Based Practice for Obtaining Blood Specimens From a Central Venous Access Device. Oncology Nursing Forum. 39(3): 247-251. May.

Navilyst Medical. (2012). BioFlo™ PICC with Endexo™ and PASV™ Valve Technology. June.

Nursing Reference Center. (2016). Blood Sampling Through an Implanted Venous Access Port. CINAHL Nursing Guide March 18.

O'Grady, N et al. (2011) Guidelines for the Prevention of Intravascular Catheter-Related infections. National Center for Infectious Diseases. Atlanta, Georgia. <http://cdc.gov/hicpac/BSI/BSI-guidelines-2011.html>

Perry, A, Potter, P. & Ostendorf, W (2014) Clinical Nursing Skills & Techniques –8th Edition. St. Louis, Missouri: Elsevier Mosby: Chapter 20: Safe Medication Preparation page 488.

CENTRAL VENOUS CATHETERS - Adult Standards November 2017

Prior to accessing CVC for any reason perform **Hand Hygiene** for at least 15 seconds with alcohol-based hand rub or antiseptic soap and water.

	PICC Clamp less, valved e.g. BioFlo PICC	PICC with clamps, non-valved	Short Term Percutaneous -jugular, subclavian or femoral	Tunneled Long term e.g. Hickman	Implanted Port chest or arm e.g. Port-a-Cath, P.A.S. port
Accessing	Syringe or IV tubing via needleless adapter				Non coring safety needle primed with 0.9% Sodium Chloride *See below for sizes available
Check Placement	<i>Gently aspirate to visualize blood return then flush with 0.9% Sodium Chloride</i>				
Frequency of Flushing and Locking <i>(Flushing and Locking not required for continuous IV infusion)</i>	Flush after each access or Once a week if unused	Flush after each access or Q 24 h if unused	Flush after each access or Q 12 h if unused	Flush & lock after each access or Once a week if unused	Flush & lock after each access or Once a month if unused
Flush Volume (0.9% sodium chloride)	10mLs before & after medication administration. 20mLs after blood administration or withdrawal				20mL
Heparin Lock (100units/mL)	N/A		N/A		5mL (500 units)
Heparin Lock Syringe Size	N/A		N/A		12mL
Dressing changes	<ul style="list-style-type: none"> ▪ Transparent semipermeable q 5-7 days and PRN when dressing soiled, wet or non-occlusive ▪ Transparent semipermeable with gauze or gauze alone q2 days ▪ Clean skin with saline prn, then for skin antiseptis use Chlorhexidine 2%/alcohol 70% swab stick. 				
Needleless Adapter Change <i>(Use needleless adapter on all unused and intermittent use CVC lumens)</i>	Once a week for unused lumens. Change every 96 hours if tubing is connected.				Once a week if port accessed
Blood Sampling Discard Volume <i>Use discard tube or 10 mL syringe</i>	1 tube or 5 mL			2 tubes or 7 mL	2 tubes or 7 mL

* Stock # in SPD: **Gripper Plus Safety Needle:** 22G X 1-215487 22G X 3/4 -215484 22G X 5/8 -215485 21G X 1-215486 20G X 3/4- 215482 20G X 5/8 -215483
Gripper Micro Safety Needle: 20G X 3/4 - 200939 22G X 3/4 - 200941 22G X 1 -200942



CENTRAL VENOUS CATHETERS - Pediatric Standards

Appendix B
December 2016

Prior to accessing CVC for any reason perform **Hand Hygiene** for at least 15 seconds with alcohol-based hand rub or antiseptic soap and water.

	PICC (under 3 Fr)	PICC (3 Fr & over)	Short Term Percutaneous - jugular, subclavian or femoral	Tunneled Long term, e.g. Hickman	Implanted Port Chest or arm
Accessing	Syringe or IV tubing via needleless adapter				Non coring safety needle primed with 0.9% Sodium Chloride
Check Placement	Flush with 5 -10mLs 0.9% Sodium Chloride	<i>Gently aspirate to visualize blood return then flush with 0.9% Sodium Chloride</i>			
Frequency of Flushing (0.9% sodium chloride) <i>Flushing NOT required for continuous IV infusion</i>	Before & after medication administration	After each intermittent access Before & after medication administration After blood administration or withdrawal			
Flush Volume (0.9% sodium chloride)	5mL	Volume weight based: less than 10 kgs: 5mL greater than 10 kgs: 10 – 20mL			10 - 20mL
Frequency of Heparin Locking <i>Locking NOT required for continuous IV infusion</i>	N/A *Unless physician specific orders written*	N/A	After each intermittent access Q 24h to unused lumen	After each intermittent access Q 24 h if accessed but not used Once a month if deaccessed	
Heparin Lock Volume (100units/mL) wt. greater than 10 kgs or accessed 5 times or less/24 hrs.	N/A	N/A	1.5mL(150units)	2.5mL(250units)	
wt less than 10 kgs or accessed 6 times or more/24 hrs.			0. 2mL heparin (100 units/mL) added to 1.8 mLs 0.9% sodium chloride (20units)	0. 2mL heparin (100 units/mL) added to 1.8 mLs 0.9% sodium chloride (20units) Deaccess ONLY: 2.5mL (250units) (Heparin 100 units /mL)	
Heparin Lock Syringe Size	12mL				
Dressing Change	<ul style="list-style-type: none"> o Transparent semipermeable with gauze or gauze alone q2days o Transparent semipermeable q 5-7 days and PRN when dressing soiled, wet or non-occlusive o Clean skin with saline prn, for skin antisepsis use 2% Chlorhexidine swabstick <p>Note: ages 2 months & under – clean skin with chlorhexidine, let the skin dry then wipe off chlorhexidine with 0.9% sodium chloride</p>				
Needleless Adapter Change <i>use adapter on all CVC lumens</i>	Once a week on unused lumens. Change every 96 hours if tubing connected.				Once a week if ACCESSED
Blood Sampling Discard Volume <i>use discard tube or 12 mL syringe</i>	No blood sampling No blood transfusions		3mL		

PICU Central Venous Care Guidelines 2016

	PICC under 3 French	PICC 3 French & over	Percutaneous CVL/CVP	Long Term Tunneled Silicone	Long Term Implanted port	Umbilical Venous (Argyle)
Lumen Volume	1.9Fr=0.105mL	3 Fr=0.145mL	Per pkg or lumen instruction	2.7Fr=0.15mL	Port-0.2-0.7mL Needle system-0.5-0.7 mL	Single Lumen 3.5 FR=0.15mL 5.0 Fr=0.30mL Multilumen-see pkg or lumen instructions
Flush & Locking						
Saline Flush/Lock -use 6 -10 mL syringe -Use stop/start motion	-Before and after meds or bloodwork -Unused: q 24 hr. -Amount to clear lumen (at least 0.5 mL)	Before and after meds or bloodwork -Unused: q 24 hr. -Amount to clear lumen(at least 0.5 mL)	-Before and after meds or bloodwork -Amount to clear lumen(at least 0.5 mL)	-Before and after meds or bloodwork Volume: < 10 kg-5 mL > 10kg-10mL	-Before and after meds or bloodwork Volume: 2-5 mL	Before and after meds or bloodwork -Amount to clear lumen
Heparin Lock (Physician Order required)	25 units/mL 0.5-1mL q 8 hrs. and prn	No-Saline Lock at least q 24 hrs. Note -consider Heparin lock if patency problematic. Order required.	0.5-1.5mL of 25 units/mL q 8 hr. & prn	Non Accessed: 1.5 mL of 100 u/mL q 24 hrs. Intermittent Access: 1.5 mL of 10 units/mL q 8hrs & prn	Non accessed: 1.5 -2.5 mL of 100 u/mL monthly Intermittent Access: 1.5-2.5mL of 25 units/mL q 8hrs & prn	4 units/mL 2x lumen volume Q 6 hours
Blood work draw	No	Yes	Yes	Yes	Yes-use port closest to patient.	Yes
Blood Discard	n/a	2x lumen volume	2x lumen volume	3-5mL	2-5mL	n/a
CVP Monitoring	No, unless ordered	No, unless ordered	Yes, Distal lumen	No, unless ordered	No, unless ordered	As ordered
Acceptable Meds (CVL dilution if fluid restricted)	ALL IV meds	ALL IV meds	ALL IV meds	ALL IV meds	ALL IV meds	ALL IV meds
Parenteral Nutrition	Dextrose <= 30%, amino acids, lipids. Consider heparin in PN at low rates	Yes-all	Yes-all	Yes-all	Yes-all	Dextrose<= 50%, amino acids, lipids
Blood administration	NO	NO unless no other site	NO-unless no other site	NO-unless no other site	Yes	Yes

	PICC under 3 French	PICC 3 French & over	Percutaneous CVL/CVP	Long Term Tunneled Silicone	Long Term Implanted port	Umbilical Venous (Argyle)
Routine Care						
Tubing Change (including stop cocks and caps not put on with sterile field)	TPN-q 24 hrs. IV -q 96 hr.	TPN-q 24 hrs. IV -q 96 hr.	TPN-q 24 hrs. IV/CVP -q 96 hr.	TPN-q 24 hrs. IV -q 96 hr.	TPN-q 24 hrs. IV -q 96 hr. Access Needle- q 7 days	Q 24 hours
Dressing -Sterile technique -Skin Asepsis with Chlorhexidine- wash off if < 2 month age	Transparent-q 7 days & prn Gauze-q 24 & prn	Transparent-q 7 days & prn Gauze-q 24 & prn	Transparent-q 7 days & prn Gauze-q 24 & prn	Transparent-q 7 days & prn Gauze-q 24 & prn	Transparent-q 7 days & prn Gauze-q 24 & prn	Transparent-q 7 days & prn Gauze-q 24 & prn