SASKATOON HEALTH REGION

CENTRAL VENOUS CATHETERS

LEARNING PACKAGE

RN - SPECIALTY PRACTICES:
- Advanced RN Procedure: Central Venous Catheter – Short Term Removal
- Advanced RN Procedure: Accessing and Discontinuing Access of an Implanted Port

LPN – Additional Competencies:
- Site care, access, lock, and flush Central Venous Catheters (Short Term, Tunnelled and Implanted Ports)
- Blood withdrawal from Central Venous Catheters (PICC, Short Term, Tunnelled and Implanted Ports).

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**ACKNOWLEDGMENTS:**

**Coordinated by:**
Helen Sabadash, Clinical Nurse Educator, Saskatoon Health Region

**Special Thanks to:**
Clinical Nurse Educators in Saskatoon Health Region
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1.0 INTRODUCTION/GENERAL INFORMATION

1.1 This package provides the basic information necessary for the nurse to understand central venous catheter (CVC) theory and nursing care.

1.2 Registered Nurses (RN) and Licensed Practical Nurses (LPN) identified by the managers in designated practice settings will be certified in the CVC procedures for which their unit is targeted.

1.3 Registered Nurse Specialty Practices: The RN/GN will:

1.3.1 Attend an educational session on Removal of Short Term Lines and/or Accessing an Implanted Port/Discontinuing Access
1.3.2 Complete the learning package and quiz and return to CNE
1.3.3 Demonstrate the CVC skills as targeted in a simulated or clinical setting
1.3.4 Complete a skills checklist with a certified RN during first access, to validate and ensure safety checks are followed appropriately.

1.4 Licensed Practical Nurses Additional Competencies: the LPN/GN will:

1.4.1 Attend an educational session on care of CVLs (Short Term, Tunneled and Implanted Ports) and/or withdrawal of blood from CVCs and/or removal of a PICC line.
1.4.2 Complete the learning package and quiz and return to CNE
1.4.3 Demonstrate the CVC skills as targeted in a simulated or clinical setting
1.4.4 Complete a skills checklist with a certified RN or LPN during first access, to validate and ensure safety checks are followed appropriately.

2.0 OBJECTIVES

Upon completion of this learning package the RN/LPN should be able to:

- describe catheter characteristics and indications for use
- identify the different insertion sites and types of catheters
- identify the potential complications of CVCs
- identify important aspects of CVC care and use
3.0 THEORY

3.1 What is a Central Venous Catheter?

A central venous catheter (CVC) is a catheter that is inserted or threaded into a large central vein with the tip placed outside the right atrium, usually in the superior vena cava.

Indications for use:
- administration of: IV fluid, parenteral nutrition, blood products, medications, chemotherapy
- when patient has limited peripheral venous access
- hemodilution of hypertonic solutions/vesicants or irritants
- resuscitation
- blood sampling
- hemodialysis
- plasmapheresis
- stem cell transplant
- central venous pressure monitoring
- long term therapy e.g. antibiotics, chemotherapy

CVC characteristics:
- biocompatible and radiopaque, made of polyurethane or silicone
- some catheters have an antimicrobial coating
- available in single, double or triple lumen and in different lengths
- multiple lumen catheters generally have one large lumen and one or two smaller lumens; diameter of lumens varies with catheter size
- a clamp is supplied for each external lumen on most CVCs, except for valved PICCs which do not require clamps
- unused lumens must be flushed and locked with fluid to maintain patency (See Central Venous Catheter - Adult / Pediatric/PICU Standards - Appendix A, B & C)

3.2 Catheter Types

CVCs are available in 5 types:

1) Short Term (percutaneous)
2) Tunnelled (long term)
3) Peripherally Inserted (PICC)
4) Implanted
5) Hemodialysis
Central Venous Catheter Learning Package

Central Venous Catheter Types and Insertion Sites

**Jugular Veins**
- short term percutaneous access
- highest infection rate & difficult to keep dressing in place
- straight insertion route - fewest complications of insertion
- long-term catheters tunnelled from the scalp in neonates
- implanted chest port catheter access
- hemodialysis & plasmapheresis access

**Subclavian Vein**
- short term percutaneous access
- lower infection rate then jugular vein
- curved insertion route - risk of pneumothorax, arterial puncture
- under clavicle - cannot palpate or apply direct pressure
- external long-term catheters & implanted ports tunnelled from pectoral area - adults & children
- hemodialysis & plasmapheresis access
- easier to dress/more comfortable than jugular

**Cephalic Vein**
- percutaneous insertion site
- easy venous access
- PICCs and peripheral implanted port
- low infection rate
- easy to dress, comfortable

**Femoral Vein**
- easy percutaneous access for emergencies and in children
- short term hemodialysis access
- higher infection rate in adults
- difficult to keep dressing in place

**Internal Jugular Vein**

**External Jugular Vein**

**Basilic Vein**
3.2.1 Short Term (Percutaneous) Central Venous Catheters

- Lumen exits are staggered and rotated
- Lumen volume:
  - Adults: 0.5 to 0.6 ml
  - Pediatrics: > 0.1 ml depending on catheter size, e.g.: 8 cm 22 gauge - 0.3 ml
- Percutaneous insertion by the physician under local anaesthetic at the bedside, or under general in the OR
- Sutured through suture wings

Special issues
- Greater risk of complications at insertion
- Higher risk of infection than other CVCs
- Not used outside hospital setting because of the risks of accidental removal
- May be inserted through an introducer - a large bore multi-access sheath
- For plasmapheresis, a rigid percutaneous catheter is used in the jugular or subclavian site, left in place for up to six weeks, locked with Sodium Citrate 4%. Sodium Citrate solution must be withdrawn before catheter is used again. Nurses outside the plasmapheresis clinic may change the dressing, but may not access the catheter for any reason.
- Removed by certified nurses or physicians
3.2.2 Peripherally Inserted Central Catheters (PICC)

- venous access over several weeks to as long as required
- used for extended antibiotics, Parenteral Nutrition (PN), blood sampling and other therapies
- lumen gauges smaller than those of other CVCs (volume: 0.04 to 0.5 ml)
- lumens exit side by side
- inserted above (or below) the antecubital fossa - usually in the basilic or cephalic vein and threaded through the subclavian vein into the superior vena cava
- percutaneous insertion by the physician under local anaesthetic in Medical Imaging
- tip is situated centrally unless it can’t be advanced past the clavicle - in this case, the tip position will be indicated in the physicians’ notes
- sutured in place

Special Issues
- PICC catheters with a built-in valve (e.g.: PASV) do not require clamps
- mechanical phlebitis may be observed in the first week after insertion - the catheter may still be used and usually does not need to be removed
- PICCs are more susceptible to kinks and damage from mechanical trauma than other external lines
- small lumen size may limit PICC use for acute fluid resuscitation or blood withdrawal
- lower risk of infection and air embolism
- venous spasm may cause resistance to removal (rare)
- Do not draw blood or take B/P on arm with a PICC
- removed by certified nurses or physicians
3.2.3 Tunnelled Central Venous Catheters

- long term venous access for several months to as long as required
- used for chemotherapy, blood sampling, Parenteral Nutrition (PN), stem cell transplants and other therapies

- silicone catheter, usually multi lumen
- **tissue ingrowth cuff** 2 cm from exit site to:
  - secure catheter by promoting fibrin growth enmeshed in the cuff
  - minimizes the risk of ascending bacteria
- **antimicrobial cuff** on some tunnelled catheters just inside the exit site
  - effective for 4-6 weeks
- catheter cut to appropriate length at insertion
- lumen volume (uncut):  
  - pediatrics - 0.15 to 0.8ml
  - adults - 0.6 to 1.8ml
- lumen exits are side by side
- inserted under local anaesthetic (general anaesthetic for pediatrics) in the OR or in Medical Imaging
- catheter is tunnelled under the skin on the chest wall and then threaded through the subclavian or jugular vein into the superior vena cava
- secured initially by sutures, which are removed
- fibrin growth cuff secures the catheter over time
- transparent or gauze dressing until exit site well healed

**Special Issues**
- for all ages, including neonates
- many patients who need tunnelled CVCs are immunosuppressed, and at higher risk for infection
- repair kits are available if external parts are damaged - these are size specific
- for children a dressing is usually used to discourage playing with the catheter
- an incision is required to release the ingrown cuff
- the procedure is done under local anaesthetic by a physician
3.2.4 Implant Central Venous Catheters

- long term venous access for several months to years
- used for chemotherapy, blood sampling, PN, and other therapies
- totally implanted system
- usually single lumen, may be double lumen
- a silicone catheter attached to a metal or plastic reservoir (port) which has a self-sealing septum for needle access
- accessed through the skin and septum into the port, with a non-coring needle
- port may be implanted centrally or peripherally
- implanted catheters may be venous, peritoneal, arterial or epidural

* this learning package refers only to venous implanted catheters *

- port volumes:
  - peripheral - 0.15 - 0.2 ml
  - adult chest port - 0.6 to 1.5ml
  - pediatric chest port - 0.2 to 0.3ml
- catheter cut to appropriate length at insertion
- system volumes (port + catheter): 0.5 to 2.7 ml
- lumen exits are side by side
- inserted under local anaesthetic (general anaesthetic for pediatrics) in the OR or in Medical Imaging
- centrally implanted: after the catheter is placed in the subclavian or internal jugular vein, the port is implanted in a subcutaneous pocket on the anterior chest wall
- peripherally implanted: after the catheter is threaded through the cephalic vein, the port is implanted on the inner surface of the upper arm
- the catheter is tunnelled under the skin between the vein entry site and the port
- a bulge in the skin is usually visible
- no external security is required when the catheter is not accessed
- when accessed, the needle is secured by the septum and a dressing
- the implanted port is usually sutured to underlying tissue to prevent rotation or migration in the subcutaneous pocket

Special issues

- confirmation of needle placement by aspiration of blood is important because needle access is blind through the skin
- the chest port septum will withstand up to 2000 punctures (arm port 100-500) if a non-coring needle is always used for access
- topical anaesthetic such as Emla or Ametop may be applied to the skin over the port prior to accessing, especially for children
- difficult to access if placed in an area of thick subcutaneous fat, e.g too close to the breast
- an incision is required to remove the port
- the procedure is done under local anaesthetic by a physician
3.2.5 Hemodialysis Catheter

**Nurses require separate certification, beyond the scope of this learning package to care for hemodialysis catheters**

- vascular access for hemodialysis
- left in place for months to years
- dual lumen catheter
- silicone or polyurethane
- larger lumen size than tunnelled CVC
- tissue ingrowth cuff
  cuffed silicone catheters are tunnelled under the skin on the chest and threaded through a jugular (or subclavian) vein into the superior vena cava in Diagnostic Imaging under fluoroscopy
- polyurethane (uncuffed) catheters are inserted into the femoral vein at the bedside (for short term use only - removed within one week)
- correct placement must be confirmed by x-ray before use (if not done using fluoroscopy)
- Short term will have 2 sutures for the entire time catheter is inserted, tunnelled should have wing sutures for 8 weeks
- fibrin growth around the cuff keeps it secured in place after sutures are removed

**Special issues:**
- For hemodialysis, Sodium Citrate is instilled to maintain the patency of large gauge lumens when not in use. All lock solutions used for hemodialysis catheters should be withdrawn before catheter is used again.

**Removal:**
- removal of cuffed catheter (long term) by Diagnostic imaging
- removal of uncuffed catheter (short term) by hemodialysis Physician.

3.2.6 Introducers (e.g. Cordis)

- Nurses require further education to care for this line. (e.g. Critical Care Orientation)
- Large bore single lumen central line that has a side port that allows a second catheter to be threaded into.
- Examples: Temporary Transvenous pacing wire, Pulmonary artery catheter, triple lumen catheter, catheter directed Alteplase catheter
- When the second catheter is removed, a specially designed cap that comes with the kit is to be placed over the side port to prevent leaking of blood
- Often used by itself as a resuscitation line because of its large size (8.5 Fr is most common, 7Fr for pacing)
- These catheters are usually in-situ for short periods of time due to the size.
• At time of removal, (in critical care whenever possible) pressure will be applied for a minimum of 5-10 minutes to prevent bleeding. Always consider coagulation.

This cap will need to be applied to the side port if it has been accessed.

An infusion should ALWAYS be connected to this port. If the introducer is no longer needed, consider starting a peripheral IV and removing the introducer.
### 3.3 Potential Complications of Central Catheters

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<th>SIGNS &amp; SYMPTOMS</th>
<th>TREATMENT/NURSING ACTION</th>
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<tr>
<td>1. <strong>Air Embolism</strong></td>
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<tr>
<td>• air enters central circulation</td>
<td>• anxiety, hypotension, confusion, unresponsiveness, cyanosis, tachycardia, chest pain, dyspnea, apnea, precordial murmur</td>
<td>• prevent air embolism on removal of short term CVCs by placing patient flat and applying an occlusive dressing for 24 h.</td>
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<td>• during insertion</td>
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<tr>
<td>• from breaks in catheter or administration system</td>
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<td>• damaged silicone catheters can sometimes be repaired</td>
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<td>• during tubing/cap changes if catheter not clamped</td>
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<tr>
<td>• during or following removal (short term)</td>
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<td>• air in the vascular system has the potential to impede and/or obstruct circulation</td>
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If air enters central circulation:
- clamp the CVC as close to the insertion site as possible to prevent more air from entering
- position patient on left side in Trendelenburg - the pulmonary artery will now be below the right ventricle; the air will rise to the wall of the right ventricle and blood flow from the ventricle will improve
- administer 100% oxygen by mask
- monitor vital signs including oxygen saturation
- notify physician

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<th>2. <strong>Catheter Occlusion</strong></th>
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<tr>
<td>• The CVC may become occluded by:</td>
<td>• the CVC may exhibit:</td>
<td>• prevent occlusion by flushing with a stop and start motion following blood withdrawal or administration and before &amp; after medication administration</td>
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<tr>
<td>• the formation of thrombus or fibrin sheath</td>
<td>• inability to infuse fluids and/or inability to aspirate blood</td>
<td>• change patient’s position, lower head, rotate shoulders, move arm</td>
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<tr>
<td>• the catheter tip may be against the wall of the vein</td>
<td>• back tracking of fluid along catheter under fibrin sheath</td>
<td>• have patient cough</td>
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<tr>
<td>• failure to flush vigorously and with positive pressure</td>
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<td>• if able to infuse, flush rapidly with saline then re-attempt aspiration</td>
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<td>• running infusions too slowly</td>
<td></td>
<td>• DO NOT ATTEMPT TO IRRIGATE BLOCKED CVC!</td>
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<td>• failure to use infusion pump correctly</td>
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<td>• if the above are unsuccessful, notify the physician/ consult Medical Imaging</td>
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<td>• kinked tubing or catheter</td>
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<td>• physician may use a thrombolytic or other agent to restore patency</td>
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<td>• compression by clavicle</td>
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<td>• precipitation of medications</td>
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<tr>
<td>• malposition of non-coring needle inn implanted port</td>
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If the CVC may exhibit:
- inability to infuse fluids and/or inability to aspirate blood
- back tracking of fluid along catheter under fibrin sheath
### COMPLICATIONS & CAUSES

<table>
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<th>3. Infection/Sepsis</th>
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<tr>
<td>- may be local and/or systemic</td>
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<td>- related to aseptic technique at insertion</td>
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<tr>
<td>- related to aseptic technique during use/care of the catheter as well as dressing technique, site, duration and IV fluid</td>
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<td>- highest risk with jugular site and Parenteral Nutrition (PN) administration</td>
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<td>- lower risk with PICCs and implanted CVCs</td>
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<td>- immuno compromised patients at higher risk</td>
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<td>- risk increases with number of lumens</td>
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<td>- associated with thrombus formation/fibrin sheath</td>
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### SIGNS & SYMPTOMS

- **systemic:**
  - fever, chills, tachycardia
  - increased WBC
- **local:** (exit site, port pocket or tunnel)
  - redness
  - drainage from site
  - tenderness

### TREATMENT/NURSING ACTION

- **HANDWASHING** is the single most important preventative measure against nosocomial infection
- maximum sterile barrier precautions on insertion
- follow standard dressing and accessing protocols
- assess site daily
- if drainage, replace transparent dressing with gauze dressing
- dedicate one lumen to PN - access this lumen only for PN
- blood cultures - peripheral and catheter sources
- removal of CVC after screen for other sources of infection
- send catheter tip for culture
- antibiotic therapy
- **Ethanol Lock Technique** may be used for CVC to clear infection

Information under Ethanol Lock in IV Reference Manual or Pharmacy for details of treatment

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<th>4. Pneumothorax / Hemothorax / Hydrothorax</th>
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<td>- air, blood or other fluid may enter the pleural space if the pleura are punctured when CVC is inserted (especially subclavian site - short term)</td>
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- pain on inspiration and expiration
- dyspnea/cough
- decreased breath sounds
- restlessness

* S&S at insertion or delayed *

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<th>5. Nerve Injuries</th>
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<td>- Can occur during insertion or while indwelling CVC due to injury of nerves from direct trauma, compression from the catheter or from inflammation from infiltration/extravasation</td>
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- pain or discomfort during or after insertion of any type of CVC
- Respiratory difficulties or dyspnea and changes in the eye such as pupil constriction or upper eyelid drooping

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<tr>
<td><strong>stop infusion</strong></td>
<td><strong>place in Fowler’s position</strong></td>
<td><strong>notify physician</strong></td>
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<tr>
<td><strong>based on the symptoms - the air, blood or fluid may resolve without mechanical evacuation</strong></td>
<td><strong>may need chest tube insertion</strong></td>
<td><strong>x-ray to confirm pneumo/hemo</strong></td>
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<td><strong>Report any symptoms of pain, tingling or numbness to physician immediately</strong></td>
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<tr>
<td>COMPLICATIONS &amp; CAUSES</td>
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| 6. **Venous Thrombosis (especially axillary or subclavian)**  
- resulting from injury to endothelium, decreased blood flow or changes in coagulation  
- large diameter catheter in a small vessel  | may be asymptomatic  
- edema of the limb closest to the catheter  
- difficulty maintaining infusion rates  
- mild to moderate neck pain radiating down the arm  
- jugular venous distention, observable collateral circulation on chest  
- stroke symptoms if the thrombus reaches the brain  | notify the physician immediately  
- dependent upon location and size of the thrombus  
- consult Medical Imaging  
- assess hematology values  
- anticoagulation therapy  |
| 7. **Malposition/Displacement of the Tip Outside the Superior Vena Cava (e.g. into another vein or extravascular)**  
- on insertion, especially if at bedside  
- due to inappropriate catheter length  
- caused by severe coughing, vomiting, sneezing or crying  
- when sutures erode or are improperly placed to secure the CVC  
- soft, small gauge PICCs more susceptible to looping and knotting  | may be asymptomatic  
- sluggish gravity drip rate  
- increasing external catheter length  
- difficulty with aspiration and/or infusion  
- swelling in the chest wall during infusion  
- leaking at the site  
- arm, shoulder or chest pain  
- vague back discomfort  
- patient reports “ear gurgling” on infusion (if tip in internal jugular vein)  
- arrhythmias if tip is in R. atrium  
- extruded cuff (tunnelled)  | stop infusion  
- notify physician  
- consult Medical Imaging  
- physician may flush rapidly with saline to restore position if there is no resistance to infusion  
- prevent slippage/removal by carefully securing catheter with dressing and/or tape  
- may spontaneously resolve  |
| 8. **Catheter Damage - External**  
- sharp objects, eg: scissors  
- damage from toothed clamp  
- excessive tension  
- excessive flushing force  | fluid leaking from catheter  
- moist dressing  
- symptoms of air embolism  | clamp catheter  
- damaged silicone catheters can sometimes be repaired with kit - percutaneous CVCs are usually replaced rather than repaired  
- as for air embolism  |
| 9. **Mechanical Phlebitis (PICCs and peripheral implanted ports)**  
- reaction of the endothelial lining of the vein on insertion  | symptoms always arise within one week of insertion  
- arm pain  
- swelling, warmth & erythema along catheter path  
- palpable vein cord  | apply warm compresses  
- should respond within 72 hours  
- catheter may still be used  |
| 10. **Extravasation (infusing into tissues)**  
- needle dislodged from implanted port  | pain, burning or stinging during infusion  
- may be local swelling  | aspirate for blood to assess access/patency  
- test with saline and assess  |
### COMPLICATIONS & CAUSES

- damaged or disconnected implanted catheter
- backtracking of IV fluid due to occlusion at catheter tip

### SIGNS & SYMPTOMS

- difficult to palpate septum
- unable to insert needle

### TREATMENT/NURSING ACTION

- S&S
- once port accessed, secure needle with a dressing
- extra caution with vesicants (medications which cause necrosis)
- notify physician
- consult Medical Imaging

### 11. Port Rotation/Migration (Implanted)

- loss of subcutaneous sutures holding the port
- twiddler’s syndrome (patient plays with port)

- notify physician for resuturing/ reassessment of location

### 3.4 Central Line Associated Blood stream infections (CLABSI)

Central venous catheters disrupt the integrity of the skin, making infection with bacteria or fungi possible. A central line–associated bloodstream infection (CLABSI) may spread to the bloodstream and cause hemodynamic changes and organ dysfunction, possibly leading to death.

It is estimated that 500 to 4,000 U.S. patients die annually from bloodstream infections. In addition, nosocomial bloodstream infections prolong hospitalization by an average of seven days. A bloodstream infection costs an estimated US$3,700 to US$29,000. There are no equivalent Canadian figures.

You can reduce CLABSIs with two bundles of key evidence-based steps.

**Central line insertion bundle:**
- Hand hygiene
- Maximal barrier precautions
- Chlorhexidine skin antisepsis
- Optimal catheter type and site selection
- Avoid the femoral vein in adults; subclavian preferred to minimize infection risk.
- Optimal catheter type and site selection in children is more complex, with the internal jugular vein or femoral vein most commonly used. Site preference in children needs to be individualized.

**Central line care bundle:**
- Daily review of line necessity, with prompt removal of unnecessary lines
- Aseptic lumen access
- Catheter site and tubing care
- PN always has a dedicated lumen

From the Canadian patient Safety Institute (CPSI)
http://www.patientsafetyinstitute.ca/en/Pages/default.aspx
4.0 SUMMARY REVIEW -

Central Venous Catheters – Summary Review

Fill in the blanks while you review the policies:

Assisting with Insertion
• One of the most important ways to prevent CVC infections is ____________.
• Each staff involved with the insertion wears: sterile gowns, gloves, masks and caps.
• Prior to procedure, large ________ drapes are placed on patient.
• An______ is taken following Short term CVC insertion to confirm placement or good blood return if emergency use required.

Assessing CVC patency
• Assess CVC function by aspirating for ___________and then flushing prior to each intermittent medication of intermittent infusion or when clinically indicated with continuous infusions
• Flush with 1-2 mLs ________ then gently aspirate the CVC for blood return then flush lumen with remainder of saline or as indicated in standards chart.

Flushing and Locking
• All PICCs are flushed/locked with ____________.
• All adult Short Term lines are flushed with ____________ q ___ hours
• Use a start and stop motion to increase turbulence inside the line. Why? ____________
• Use a _____ ml syringe to flush central lines
• The following CVC are locked with Heparin Flush (Adults): ______________________
• The following CVCs are locked with Heparin Flush (Peds) ______________________

Tubing changes
• Change IV tubing and extension sets q _____ h
• Change CVC needleless adapter (MicroClave Clear) q _____ days
• Change PN tubing q ____ hours
• Change blood tubing q8h, or ________________

Dressings
• Sterile gauze dressing is changed q ___ days
• Sterile______________ dressing is changed q _____ days or prn.
• Use ______________ swab sticks to clean insertion site with back and forth motion for ________ seconds always let dry completely before re-applying the dressing.

Blood withdrawal
• Blood cultures require no discard. Use the ________ method of blood w/d for blood culture tubes.
• Change the needleless adapter (MicroClave Clear) if present before drawing blood cultures
• Use a ________________ to transfer blood from syringe to tubes.
• Flush with saline (and heparin if indicated).
• Clean top of blood tube with ___________ before sending to lab
• Label blood tube with ___________.
• Place in small plastic bag with tie. Send to lab with requisition.

Implanted Ports
• Always use a ______________ needle to access ports
• Confirmation of needle placement is done by ________________________.
• Access port using ___________ technique:
  • Palpate port with thumb and index finger
  • Clean skin with _______________ . Prime needle and tubing with saline
- Insert needle perpendicular until it touches the _____ of the port.
- Use sterile semi-permeable transparent dressing to cover

**Removal of Short Term Lines**
- Prior to removing a ST line the patient should be positioned: _______________.
- Wash hands, remove dressing, clean sutures and insertion site with ____________ then remove sutures.
- Hold line with gauze and remove on exhalation to increase thoracic pressure to decrease risk of _________________.
- Apply pressure to insertion site for at least ________ minutes and until bleeding has stopped
- Patient should lie flat for ________ min. following removal
- Apply sterile _______dressing (so no air can go in).
- Assess site __________________________.

**Removal of PICC lines**
- Prior to removing PICC line, position arm: _________________.
- Clean insertion site with chlorhexidine and remove sutures (if stat lock present, clean after removal)
- Describe removal technique for PICC line: ______________________________
- Apply pressure to removal site
- Apply band aid
5.0 APPENDICES - POLICIES

Note: This is a Summary of the CVC Insertion Policy

Assisting with Insertion of a Central Venous Catheter

When would I be assisting with a Central Venous Catheters Insertion?
Generally nurses would be assisting with insertion of a Short Term/Percutaneous CVC if the patient’s condition requires this procedure:
- Trauma
- Patient condition deteriorates on the unit

Main points to remember:
- Insertion is performed using sterile technique
- All personnel involved must wash hands before gloving
- All personnel involved in procedure must wear sterile gowns, gloves, mask and cap
- Large sterile drapes on the patient
- Chest X-ray to confirm placement before using (flushing & locking is permitted)
- If emergency access required, may be used with good blood return (confirmation X-ray should be done later)

Supplies required: (a kit is being developed that will include all required supplies)
- CVC insertion tray
- Central venous Catheter
- Sterile drapes, gowns, gloves, gauze
- Antiseptic cleaning solution (Chlorhexidine preferred)
- Opsite IV 3000 or gauze for dressing
- Needleless adapter for CVC lumen ends
- Saline flush syringes
- Heparin Flush, syringes and blunt needles

How will I need to help?
- Get supplies
- help position the patient
- assist with procedure as required

Following Procedure:
- Place needleless adapter ends on any lumen not connected to continuous IV infusion, flush and lock with Heparin flush solution (100u/ml) –see standards chart in CVC-Care of - Policy)
- Clean insertion site with Chlorhexidine 2% swab and cover with gauze or IV 3000 dressing
- Arrange for a chest x-ray to check placement of CVC
- Document on Nursing Progress record: date, time, catheter type, site, physician doing the insertion and patient’s tolerance of the procedure. Document Heparin Flush on the MAR or appropriate record, record CVC information on Care plan. Pediatrics: record catheter length and size.
- Report to physician any signs or symptoms of complications of insertion: dyspnea, cardiac arrhythmias, hematoma, excessive bleeding
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DEFINITIONS

This Policy applies to care of Central Venous Catheters (CVC): A venous access device whose tip dwells in the superior or inferior vena cava:

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

Implanted Port- access is through a port that is surgically placed in the chest or arm. Note: Accessing Implanted Ports is not an LPN Additional Competency. LPNs can maintain an Implanted Port once accessed by an RN or GN.

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.

Other Central Lines:

Introducer Catheters – large lumen catheters usually placed in a jugular or subclavian vein used for administration of fluids or for threading of other lines in ER or critical care (e.g. cordis, trauma line). There must always be an infusion running through the introducer and it should not be “locked”. Whenever possible these lines will be removed while the patient is in critical care. Extra caution may be required due to increased risk for infection, air embolism or hemorrhage.

Hemodialysis Catheter – these large dual lumen catheters are usually placed in the internal jugular or subclavian vein for hemodialysis. These catheters are used ONLY for dialysis and are not to be accessed for general IV use. Dressing changes may be done following central line care principles, however, all other care will be performed only by hemodialysis or CRRT trained nurses. Refer to SHR.
Nursing Policy: Hemodialysis – Vascular access #2410 and Hemodialysis Catheters – Emergent Access to Line #1099

ROLES

Graduate Licensed Practical Nurses (GLPNs) – GLPN certification for this Additional Competency is under review by the SHR Nursing Practice Committee. GLPNs will not be certified until the review is completed.

Graduate Nurses (GNs) - as assigned RNs provide care for Short Term, Tunneled and Implanted Central Venous Catheters with direct supervision until determined by an RN supervisor to be competent to practice autonomously for the following skills: accessing, dressing changes, tubing and adapter changes and flushing/locking.

Licensed Practical Nurses (LPNs) – LPN certification for this Additional Competency is under review by the SHR Nursing Practice Committee. As assigned, currently certified LPNs may continue to provide care for Short Term, Tunneled and Implanted CVCs for the following skills: accessing, dressing changes, tubing and adapter changes and flushing/locking. LPNs requiring initial certification will not be certified until the review is completed. Prerequisite: LPN must have completed SaskPolytechnic IV Therapy/Blood & Blood Products Completer Course or equivalent

Medical Radiology Technologists (MRT) care for clients seen in Medical Imaging for Short Term, Tunneled and Implanted Central Venous Catheters for the following skills: accessing, dressing changes, tubing and adapter changes and flushing/locking.

Registered Nurses (RNs) – as assigned RNs provide care for Short Term, Tunneled and Implanted Central Venous Catheters for the following skills: accessing, dressing changes, tubing and adapter changes and flushing/locking.

1. PURPOSE

1.1. To maintain the patency of central venous catheters.

1.2. To minimize the risk of infection, damage, displacement and other complications associated with the care and use of CVCs.

2. POLICY

2.1 Physician Order required

- Heparin lock

2.2 Special Considerations

- 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
- Assess daily the continued need for a CVC
- To prevent peripheral implanted port occlusion and/or damage, avoid using same arm for BP’s or venipuncture

2.3 Accessing a CVC

- Assess CVC function by aspirating for blood return and flushing prior to each intermittent CVC use (administration of medication or infusion) and as clinically indicated with continuous infusions (e.g. occlusion alarms) Exception: Acute Care Pediatrics/PICU small lumen (3 Fr. And under) where no blood withdrawal or blood
infusion is recommended. Physician will be notified and Medical Imaging may be consulted for intervention if unable to flush a lumen or if unable to aspirate for blood return

- Direct luer lock connections will be used for continuous infusions
- Intermittent medications/fluid will be administered through a needleless adapter or needleless injection port on IV tubing
- Acute Care Pediatrics: applies a needleless adapter for all IV infusions
- Needleless adapters will be cleaned for 15 seconds using an alcohol swab and friction in a twisting motion prior to each access (scrub the hub)
- For accessing an Implanted Port see SHR Nursing Policy: Central Venous Catheters – Implanted Ports – Accessing and Discontinuing Access #1032

2.4 Flushing and locking CVCs (not required for continuous IV infusions)

Refer to Adult/Pediatric Standards chart Appendix A, B & C

2.4.1 Flush all CVC lumens with 0.9% Sodium Chloride (Short term, tunneled and implanted)

- after blood withdrawal
- after blood administration
- before and after each medication administration,
- for maintenance of an unused lumen
  - Flush lumens using stop & start flush technique
  - CVCs will be flushed using at least a 10mL syringe to avoid excessive pressure, to avoid possible rupture of the catheter or dislodgement of a clot
  - Physician will be notified and Medical Imaging may be consulted for intervention if unable to flush a lumen or aspirate blood

2.4.2 Lock the following with: Heparin flush (100 units/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

2.5 Changing Tubing and Adapters

- Prior to changing needleless adapters or tubing, clean connection for 15 seconds using an alcohol swab and friction in a twisting motion
- Prime tubing and adapters prior to attaching to CVC

2.5.1 Needleless Adapters:

- CVC lumens will be capped with a sterile needleless adapter at all times when not directly connected to tubing

  Acute Care Pediatrics: needleless adapter applied to all IV infusions

Home Care Clients only: for clients only getting a weekly maintenance flush, Luer lock plugs (or dead enders) may be used (replaced after each access)

Change needleless adapters: every 7 days and if removed for any reason, if there is residual blood or debris within the needleless connector and prior to drawing a sample for blood culture. Document change on care plan/flowsheet.
2.5.2 **Tubing and extension sets** will be changed q96hrs except:
- lipid emulsions: parenteral nutrition tubing q 24hr
- propofol q 12hr (RN only)
- blood transfusion tubing q 8 hours, after 4 units infused or if more than an hour has elapsed between infusions
  - When tubing is changed, any needleless adapters, stopcocks or other tubing connected to the same lumen must be changed at the same time
  - New IV tubing will be used when a new CVC is inserted
- Clamp lumens with manufacturer’s clamp when not in use (non-valved CVCs)

2.6 **Dressing Changes**
Use aseptic technique using sterile gloves when applying new dressings.
Skin will be disinfected with Chlorhexidine 2%/Alcohol 70% during dressing changes
*Note*: for infants less than 2 months, or client sensitive to chlorhexidine, use povidone-iodine swab or 70% alcohol swab or wipe off chlorhexidine with sterile saline

2.6.1 **Dressings will be changed**:
- Transparent semi-permeable dressing every 5-7 days and prn when dressing soiled, wet or non-occlusive.
- Gauze (or combination of gauze & transparent dressing) – every 2 days

Site will be assessed at least every 8 hours for:
- signs of inflammation
- infection
- bleeding
- leakage at insertion site
- length of CVC
- secure sutures/securement device

Report any concerns to the physician.
**Home Care**: Educate the client/family to recognize and report any of the above symptoms to their nurse

2.7 **Catheter Securement**
CVC must be stabilized with sutures or stabilization device.
If CVC migrates externally it should not be advanced back into the vein. The CVC should be stabilized at the point of external migration and assessed by physician/Medical Imaging prior to further use.

2.8 **Catheter Damage**
If the CVC catheter becomes damaged, immediately clamp the line between the break and the chest wall to prevent air embolism or bleeding from the device. Notify the physician immediately.

*Note*: some tunneled catheters may be repaired by the physician using a repair kit (kits are size specific).

3. **PROCEDURES**

3.1 **Assessing CVC patency** – Assess CVC function by aspirating for blood return and flushing prior to each intermittent medication or intermittent infusion or when clinically indicated with
Continuous infusions. **Exception:** Acute Care Pediatrics/PICU small lumen (3Fr. and under) where no blood withdrawal or blood infusion is recommended.

### Supplies
- 10 mL syringe prefilled with 0.9% Sodium Chloride
- Alcohol swabs
- CVC Adult, Pediatric or PICU Standards (Appendix A, B & C) for flush volumes

#### 3.1.2 Perform hand hygiene.

#### 3.1.3 Clean needleless adapter for 15 seconds using an alcohol swab and friction in a twisting motion. Allow to dry.

#### 3.1.4 Attach 10mL syringe prefilled with 0.9% sodium chloride.

#### 3.1.5 Gently flush lumen with 1-2 mLs of 0.9% sodium chloride.

#### 3.1.6 Gently aspirate the CVC for blood return just until blood can be seen in the CVC lumen

#### 3.1.7 Flush the lumen with remainder of saline, using stop and start flush technique.

#### 3.1.8 Administer medication/infusion.

#### 3.1.9 Perform hand hygiene following procedure.

#### 3.1.10 Following medication administration, flush lumen as per Standards (Appendix A, B & C)

### 3.2 Flushing and Locking

3.2.1 Flushing and locking is performed on Central Venous Catheters that are used intermittently (not connected to a running infusion), following each access. If the CVC is not routinely accessed then these lumens are flushed/locked on a schedule specific to each type of CVC (Adult/Pediatric/PICU Standards - Appendix A, B & C).

#### 3.2.2 Supplies:
- 10mL syringe prefilled with 0.9% sodium chloride (1 for each lumen to be flushed
- Heparin solution 100 units/mL
- Needles (blunt) and syringes to draw up Heparin
- Alcohol swabs
- CVC Pediatric or Adult Standards chart (Appendix A, B & C) for amounts of flush and lock solutions to be used

#### 3.2.3 Perform hand hygiene

#### 3.2.4 Open catheter clamp (non-valved CVC).

#### 3.2.5 Clean needleless adapter for 15 seconds using an alcohol swab and friction in a twisting motion. Allow to dry.

#### 3.2.6 **Flush:** Attach 0.9% Sodium Chloride flush syringe, inject the required volume and remove the empty syringe:
- after blood withdrawal, before and after medication administration, for maintenance of an unused lumen
- using a stop and start flush technique

**Note:** A pulsatile flushing technique of 10 short boluses of 1 mL interrupted by brief pauses may be effective at removing solid deposits.

- Do not use force to flush or lock a CVC.

3.2.7 **Lock:** Inject Heparin flush through the needleless adapter and remove the empty syringe. The MicroClave needleless adapter maintains neutral pressure within the CVC which prevents the back flow of blood into the catheter.

3.2.8 Clamp the catheter after the syringe has been removed (on CVC's that have a clamp).

3.2.9 Repeat the procedure for other lumens.

**Note:** Use separate flush and lock syringes for each lumen.

3.2.10 Perform hand hygiene following the procedure.

3.2.11 Documentation:
- Record Heparin administration on appropriate record.
- Record fluid volumes as appropriate on Fluid Balance Record.

### Tubing and Adapter Change

3.3.1 **Supplies:**
- alcohol swabs
- primed needleless adapter
- primed tubing
- extension set (if needed)
- Multiport stopcock (critical care only)
- syringe with Heparin if needed - see Standards chart
- 10mL syringe prefilled with 0.9% Sodium Chloride
- Tubing change sticker
- Clean gloves

3.3.2 Perform hand hygiene and apply clean gloves.

3.3.3 For tubing change, stop IV infusion.

3.3.4 For clamped CVC, clamp lumen to prevent air embolism or blood loss.

3.3.5 Clean needleless adapter or tubing connection where the hub meets the lumen for 15 seconds using an alcohol swab and friction in a twisting motion. Allow to dry.

3.3.6 Loosen connection to facilitate rapid change over. If difficult to loosen, use a tourniquet or glove for improved grip. Do not use metal forceps as this could damage the hub.

3.3.7 Disconnect tubing or adapter.

3.3.8 Clean CVC catheter end with alcohol swab. Allow to dry.
3.3.9 While maintaining aseptic technique to avoid catheter contamination, connect new primed tubing or adapter.

3.3.10 Unclamp catheter and re-establish IV infusion, if applicable.

3.3.11 Flush and lock unused lumens according to CVC Standards (Appendix A, B & C).

3.3.12 Remove gloves and perform hand hygiene following procedure.

3.3.13 Document date of tubing or adapter change on care plan or other appropriate document. Write date changed on tubing change sticker and attach to tubing.

3.4 **Dressing Change**

3.4.1 Supplies:
- dressing tray/set (if needed)
- clean gloves
- sterile gloves
- 0.9% Sodium Chloride (for skin cleansing if required)
- 2% Chlorhexidine 2%/Alcohol 70% - swab sticks for skin disinfection
- Sterile transparent semi-permeable or sterile gauze dressing
- tape if needed
- sterile cotton tipped applicators (if required)
- Alcohol based hand sanitizer

3.4.2 Perform hand hygiene and don clean gloves.

3.4.3 Remove dressing.

3.4.4 Discard gloves and dressing.

3.4.5 Perform hand hygiene.

3.4.6 Inspect insertion site for:
- signs of infection or inflammation
- secure sutures or stabilization device in place
- catheter slippage/movement
- leaking IV fluid
- pain or swelling along tunneled area

Notify physician promptly if any of the above are noted.

3.4.7 If drainage is present, cleanse skin and catheter with 0.9% Sodium Chloride using aseptic technique.

3.4.8 Disinfect skin with 2% Chlorhexidine/Alcohol 70% swab stick applicator. With the first swab stick, using friction, clean around the exit site of catheter and area where dressing is to be placed using a back and forth motion for 15 seconds. Flip the swab stick and moving in opposite direction clean site for another 15 seconds. With the second swab stick, cleanse length of exposed catheter. For patients less than 2 months old wipe off chlorhexidine after 30 seconds with sterile 0.9% Sodium Chloride.
3.4.9 If there is a contraindication to chlorhexidine, providine-iodine or 70% alcohol can be used as alternatives.

*Note:* Silicone catheters can be damaged with adhesive removers and acetone.

3.4.10 Allow skin to dry completely.

3.4.11 Apply skin protectant to area for irritated or fragile skin and if catheter stabilization device will be used (using aseptic technique and avoiding the insertion site).

3.4.12 Perform hand hygiene.

3.4.13 Don sterile gloves.

3.4.14 Apply new catheter stabilization device if catheter is not sutured in place (follow manufacturer’s directions for use).

3.4.15 Apply transparent semipermeable dressing to cover both the insertion site and sutures/securement device. Lay transparent dressing in place and mold it over the catheter with fingertips. Do not stretch dressing over skin surface. Slightly overlap the border tabs under hub of lumens. Press transparent portion of dressing into place. Add adhesive strips to stabilize CVC and to label dressing change date. Apply gentle pressure to entire dressing to ensure optimal adhesion.

3.4.16 If using plain sterile gauze, secure with a full border of tape or cover with transparent dressing.

3.4.17 Secure tubing to the skin with supplied tape strips to prevent traction on the dressing or insertion site.

3.4.18 Remove gloves and perform hand hygiene

3.4.19 Document dressing change and condition of insertion site on appropriate record.

**Other CVC policies:**
#1001 Central Venous Catheters – Care of Peripherally Inserted Central Catheters
#1042 Central Venous Catheters – Blood Withdrawal - PICC, Short Term, Tunneled, Implanted
4. REFERENCES


## CENTRAL VENOUS CATHETERS - Adult Standards  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.

<table>
<thead>
<tr>
<th>Accessing</th>
<th>PICC</th>
<th>Short Term</th>
<th>Tunneled</th>
<th>Implanted Port</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clamp less, valved e.g. BioFlo PICC</td>
<td>Percutaneous - jugular, subclavian or femoral</td>
<td>Long term e.g. Hickman</td>
<td>chest or arm e.g. Port-a-Cath, P.A.S. port</td>
</tr>
</tbody>
</table>

**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**
- Gently aspirate to visualize blood return then flush with 0.9% Sodium Chloride

**Frequency of Flushing and Locking**
- **Flushing and Locking not required for continuous IV infusion**
  - Flush after each access or **Once a week** 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
- 3mL (300 units)
- 5mL (500 units)

**Heparin Lock Syringe Size**
- N/A
- 12mL
- 12mL

**Dressing changes**
- 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 antisepsis use Chlorhexidine 2%/alcohol 70% swab stick.

**Needleless Adapter Change** (Use needleless adapter on all unused and intermittent use CVC lumens)
- Once a week for unused lumens. Change every 96 hours if tubing is connected.
- Once a week if port accessed

**Blood Sampling Discard Volume**
- Use discard tube or 10 mL syringe
  - 1 tube or 5 mL
  - 2 tubes or 7 mL
  - 2 tubes or 7 mL

  **Gripper Micro Safety Needle**: 20G X ¾ - 200939 22G X ¾ - 200941 22G X 1 - 200942

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*Page 28 of 65*
## CENTRAL VENOUS CATHETERS - Pediatric Standards

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.

<table>
<thead>
<tr>
<th>Accessing</th>
<th>PICC (under 3 Fr)</th>
<th>PICC (3 Fr &amp; over)</th>
<th>Short Term Percutaneous - jugular, subclavian or femoral</th>
<th>Tunneled Long term, e.g. Hickman</th>
<th>Implanted Port Chest or arm</th>
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<tr>
<td>Syringe or IV tubing via needleless adapter</td>
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<th>Tunneled Long term, e.g. Hickman</th>
<th>Implanted Port Chest or arm</th>
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</thead>
<tbody>
<tr>
<td>Flush with 5 - 10mLs 0.9% Sodium Chloride</td>
<td>Gently aspirate to visualize blood return then flush with 0.9% Sodium Chloride</td>
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<tr>
<th>Frequency of Flushing (0.9% sodium chloride)</th>
<th>PICC (under 3 Fr)</th>
<th>PICC (3 Fr &amp; over)</th>
<th>Short Term Percutaneous - jugular, subclavian or femoral</th>
<th>Tunneled Long term, e.g. Hickman</th>
<th>Implanted Port Chest or arm</th>
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</thead>
<tbody>
<tr>
<td>Flushing NOT required for continuous IV infusion</td>
<td>Before &amp; after medication administration</td>
<td>After each intermittent access Before &amp; after medication administration After blood administration or withdrawal</td>
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</thead>
<tbody>
<tr>
<td>5mL</td>
<td>Volume weight based: less than 10 kgs: 5mL greater than 10 kgs: 10 – 20mL</td>
<td>10 - 20mL</td>
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</table>

<table>
<thead>
<tr>
<th>Frequency of Heparin Locking</th>
<th>PICC (under 3 Fr)</th>
<th>PICC (3 Fr &amp; over)</th>
<th>Short Term Percutaneous - jugular, subclavian or femoral</th>
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<tr>
<td>Locking NOT required for continuous IV infusion</td>
<td>N/A <em>Unless physician specific orders written</em></td>
<td>N/A</td>
<td>After each intermittent access Q 24h to unused lumen</td>
<td>After each intermittent access Q 24h if accessed but not used Once a month if deaccessed</td>
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<thead>
<tr>
<th>Heparin Lock Volume (100 units/mL)</th>
<th>PICC (under 3 Fr)</th>
<th>PICC (3 Fr &amp; over)</th>
<th>Short Term Percutaneous - jugular, subclavian or femoral</th>
<th>Tunneled Long term, e.g. Hickman</th>
<th>Implanted Port Chest or arm</th>
</tr>
</thead>
<tbody>
<tr>
<td>wt. greater than 10 kgs or accessed 5 times or less/24 hrs.</td>
<td>N/A</td>
<td>N/A</td>
<td>1.5mL (150 units)</td>
<td>2.5mL (250 units)</td>
<td></td>
</tr>
<tr>
<td>wt less than 10 kgs or accessed 6 times or more/24 hrs.</td>
<td>N/A</td>
<td>N/A</td>
<td>0.2mL heparin (100 units/mL) added to 1.8 mL 0.9% sodium chloride (20 units)</td>
<td>Deaccess ONLY: 2.5mL (250 units) (Heparin 100 units/mL)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Heparin Lock Syringe Size</th>
<th>PICC (under 3 Fr)</th>
<th>PICC (3 Fr &amp; over)</th>
<th>Short Term Percutaneous - jugular, subclavian or femoral</th>
<th>Tunneled Long term, e.g. Hickman</th>
<th>Implanted Port Chest or arm</th>
</tr>
</thead>
<tbody>
<tr>
<td>12mL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dressing Change</th>
<th>PICC (under 3 Fr)</th>
<th>PICC (3 Fr &amp; over)</th>
<th>Short Term Percutaneous - jugular, subclavian or femoral</th>
<th>Tunneled Long term, e.g. Hickman</th>
<th>Implanted Port Chest or arm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparent semipermeable with gauze or gauze alone q2days</td>
<td>Transparent semipermeable q 5-7 days and PRN when dressing soiled, wet or non-occlusive</td>
<td>Clean skin with saline prn, for skin antisepsis use 2% Chlorhexidine swab stick Note: ages 2 months &amp; under – clean skin with chlorhexidine, let the skin dry then wipe off chlorhexidine with 0.9% sodium chloride</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Needleless Adapter Change</th>
<th>PICC (under 3 Fr)</th>
<th>PICC (3 Fr &amp; over)</th>
<th>Short Term Percutaneous - jugular, subclavian or femoral</th>
<th>Tunneled Long term, e.g. Hickman</th>
<th>Implanted Port Chest or arm</th>
</tr>
</thead>
<tbody>
<tr>
<td>use adapter on all CVC lumens</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Once a week if ACCESSED</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blood Sampling Discard Volume</th>
<th>PICC (under 3 Fr)</th>
<th>PICC (3 Fr &amp; over)</th>
<th>Short Term Percutaneous - jugular, subclavian or femoral</th>
<th>Tunneled Long term, e.g. Hickman</th>
<th>Implanted Port Chest or arm</th>
</tr>
</thead>
<tbody>
<tr>
<td>No blood sampling</td>
<td>No blood transfusions</td>
<td></td>
<td></td>
<td></td>
<td>3mL</td>
</tr>
</tbody>
</table>
# PICU Central Venous Care Guidelines 2016

<table>
<thead>
<tr>
<th>Lumen Volume</th>
<th>PICC under 3 French</th>
<th>PICC 3 French &amp; over</th>
<th>Percutaneous CVL/CVP</th>
<th>Long Term Tunneled Silicone</th>
<th>Long Term Implanted port</th>
<th>Umbilical Venous (Argyle)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.9Fr=0.105mL</td>
<td>3 Fr=0.145mL</td>
<td>Per pkg or lumen instruction</td>
<td>2.7Fr=0.15mL</td>
<td>Port-0.2-0.7mL Needle system-0.5-0.7 mL</td>
<td>Single Lumen 3.5 Fr=0.15mL 5.0 Fr=0.30mL Multilumen-see pkg or lumen instructions</td>
</tr>
</tbody>
</table>

## Flush & Locking

<table>
<thead>
<tr>
<th>Saline Flush/Lock</th>
<th>-Before and after meds or bloodwork -Unused: q 24 hr. -Amount to clear lumen (at least 0.5 mL)</th>
<th>Before and after meds or bloodwork</th>
<th>-Before and after meds or bloodwork -Amount to clear lumen(at least 0.5 mL)</th>
<th>-Before and after meds or bloodwork Volume: &lt; 10 kg-5 mL &gt; 10kg-10mL</th>
<th>-Before and after meds or bloodwork Volume: 2-5 mL</th>
<th>Before and after meds or bloodwork -Amount to clear lumen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saline Flush/Lock</td>
<td>Syringe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saline Flush/Lock</td>
<td>-Use stop/start motion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saline Flush/Lock</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heparin Lock (Physician Order required)</td>
<td>25 units/mL 0.5-1mL q 8 hrs. and prn</td>
<td>No-Saline Lock at least q 24 hrs.</td>
<td>0.5-1.5mL of 25 units/mL q 8 hr. &amp; prn</td>
<td>Non Accessed: 1.5 mL of 100 u/mL q 24 hrs.</td>
<td>Non accessed: 1.5 -2.5 mL of 100 u/mL monthly</td>
<td>4 units/mL 2x lumen volume Q 6 hours</td>
</tr>
<tr>
<td>Blood work draw</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes-use port closest to patient.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Blood Discard</td>
<td>n/a</td>
<td>2x lumen volume</td>
<td>2x lumen volume</td>
<td>3-5mL</td>
<td>2-5mL</td>
<td>n/a</td>
</tr>
<tr>
<td>CVP Monitoring</td>
<td>No, unless ordered</td>
<td>No, unless ordered</td>
<td>Yes, Distal lumen</td>
<td>No, unless ordered</td>
<td>No, unless ordered</td>
<td>As ordered</td>
</tr>
<tr>
<td>Acceptable Meds (CVL dilution if fluid restricted)</td>
<td>ALL IV meds</td>
<td>ALL IV meds</td>
<td>ALL IV meds</td>
<td>ALL IV meds</td>
<td>ALL IV meds</td>
<td>ALL IV meds</td>
</tr>
<tr>
<td>Parenteral Nutrition</td>
<td>Dextrose =&lt; 30%, amino acids, lipids. Consider heparin in PN at low rates</td>
<td>Yes-all</td>
<td>Yes-all</td>
<td>Yes-all</td>
<td>Yes-all</td>
<td>Dextrose=&lt; 50%, amino acids, lipids</td>
</tr>
<tr>
<td>Blood administration</td>
<td>NO</td>
<td>NO unless no other site</td>
<td>NO-unless no other site</td>
<td>NO-unless no other site</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Routine Care</td>
<td>PICC under 3 French</td>
<td>PICC 3 French &amp; over</td>
<td>Percutaneous CVL/CVP</td>
<td>Long Term Tunneled Silicone</td>
<td>Long Term Implanted port</td>
<td>Umbilical Venous (Argyle)</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------</td>
<td>----------------------</td>
<td>----------------------</td>
<td>---------------------------</td>
<td>--------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td><strong>Tubing Change</strong> (including stop cocks and caps not put on with sterile field)</td>
<td>TPN-q 24 hrs. IV -q 96 hr.</td>
<td>TPN-q 24 hrs. IV -q 96 hr.</td>
<td>TPN-q 24 hrs. IV/CVP -q 96 hr.</td>
<td>TPN-q 24 hrs. IV -q 96 hr.</td>
<td>TPN-q 24 hrs. IV -q 96 hr.</td>
<td>Q 24 hours</td>
</tr>
<tr>
<td><strong>Dressing</strong></td>
<td>Transparent-q 7 days &amp; prn Gauze-q 24 &amp; prn</td>
<td>Transparent-q 7 days &amp; prn Gauze-q 24 &amp; prn</td>
<td>Transparent-q 7 days &amp; prn Gauze-q 24 &amp; prn</td>
<td>Transparent-q 7 days &amp; prn Gauze-q 24 &amp; prn</td>
<td>Transparent-q 7 days &amp; prn Gauze-q 24 &amp; prn</td>
<td>Transparent-q 7 days &amp; prn Gauze-q 24 &amp; prn</td>
</tr>
</tbody>
</table>
DEFINITIONS

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

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.

ROLES

Graduate Nurses (GNs) - as assigned, GNs provide PICC care with direct supervision until determined by an RN supervisor to be competent to practice autonomously.

Graduate Licensed Practical Nurses (GLPNs) – as assigned, GLPNs provide PICC care with direct supervision until determined by an RN or LPN supervisor to be competent to practice autonomously.

Licensed Practical Nurses (LPNs) – as assigned, LPNs provide PICC care. Prerequisite: LPN must have completed SaskPolytechnic IV Therapy/Blood & Blood Products Completer Course or equivalent.

Registered Nurses (RNs) – as assigned, RNs provide PICC care.

Registered Psychiatric Nurses (RPNs) - role with PICC care is currently under review.

Medical Radiology Technologists (MRT) - as assigned, MRTs provide PICC care.

2. PURPOSE

2.1. To maintain the patency of PICCs.
2.2. To minimize the risk of infection, damage, displacement and other complications associated with the care and use of PICCs.

3. POLICY

3.1. Special Considerations

- Prior to accessing PICCs for any reason, nurses must perform appropriate Hand Hygiene procedures (Infection Prevention & Control policy #20-20).
- To decrease the risk of contamination, accessing PICCs should be kept to a minimum.
- The continued need for a PICC will be assessed daily or per home visit.
- To prevent peripheral PICC occlusion and/or damage, avoid using the same arm with PICC for BPs or venipuncture.

3.2. Accessing a PICC

- Assess CVC function by aspirating for blood return and then flushing prior to each intermittent CVC use (administration of medication or infusion) and as clinically indicated with continuous infusions (e.g. occlusion alarms). **Exception**: Acute Care Pediatrics/PICU small lumen (3 Fr. and under) no blood withdrawal or blood infusion is recommended. Physician will be notified and Medical Imaging may be consulted for intervention if unable to flush a lumen or if unable to aspirate for blood return.
- Direct luer lock connections will be used for continuous infusions.
- Intermittent medications/fluid will be administered through a needleless adapter or needleless injection port on IV tubing.
- Acute Care Pediatrics: applies a needleless adapter for all IV infusions.
- Needleless adapters will be cleaned for 15 seconds using an alcohol swab and friction in a twisting motion prior to each access (scrub the hub).

3.3. Flushing PICCs

- Flushing is performed on PICCs that are used intermittently (not connected to a continuous infusion) and following each access.
- If the PICC is not routinely accessed each lumen is flushed on a schedule specific to the type of PICC (See CVC Adult, Pediatric or PICU Standards - Appendix A,B &C).
- PICCs will be flushed with 0.9% Sodium Chloride using stop & start flush technique:
  - after blood withdrawal,
  - after blood administration,
  - before and after each medication administration,
  - for maintenance of an unused lumen.
- PICCs will be flushed using at least a 10mL syringe to avoid excessive pressure, to avoid possible rupture of the catheter or dislodgement of a clot.
- Physician will be notified and Medical Imaging may be consulted for intervention if unable to flush a lumen or if unable to aspirate for blood return.

  **Note**: Clients receiving treatment from the Saskatchewan Cancer Agency should be advised to contact the Cancer Clinic prior to their next appointment if there are any flushing concerns (e.g. sluggish or blocked lumen).

- Acute Care Pediatrics, PICU and NICU follow unit protocols for flushing PICCs.

3.4. Changing Tubing and Adapters

- Prior to changing needleless adapters or tubing, clean connection for 15 seconds using an alcohol swab and friction in a twisting motion.
- Prime tubing and adapters prior to attaching to PICC line.

3.4.1. Needleless Adapters:
- PICC lumens will be capped with a sterile needleless adapter at all times when not directly connected to tubing
- **Acute Care Pediatrics** needleless adapter applied to all IV infusions
- **Home Care Clients only**: for clients only getting a weekly maintenance flush, Luer lock plugs (or dead enders) may be used (replaced after each access)
- **Change needleless adapters**: every 7 days and if removed for any reason, if there is residual blood or debris within the needleless connector and prior to drawing a sample for blood culture. Document change on care plan/flowsheet.

3.4.2. **Tubing and extension sets**: will be changed q96hrs except:
- lipid emulsions: parenteral nutrition tubing q 24hr
- propofol q 12hr (RN only)
- blood transfusion tubing q 8 hours, after 4 units infused or if more than an hour has elapsed between infusions
  - When tubing is changed, any needleless adapters, stopcocks or other tubing connected to the same lumen must be changed at the same time
  - New IV tubing will be used when a new PICC is inserted

3.5. **Dressing Changes**
- Use aseptic technique using sterile gloves when applying new dressings
- Skin will be disinfected with Chlorhexidine 2%/Alcohol 70% during dressing changes

  **Note**: for infants less than 2 months or client is sensitive to chlorhexidine, use providine–iodine swab or 70% alcohol swab or disinfect with chlorhexidine then wipe off with sterile saline

3.5.1. **Dressings will be changed**:
- Follow orders for initial dressing change following insertion
- Transparent semipermeable dressing every 5-7 days and prn when dressing soiled, wet or non-occlusive.
- Gauze (or combination of gauze & transparent dressing) – every 2 days
- If the patient has a securement device such as Stat Lock it is changed every 7 days with the dressing change.
- Site will be assessed at least every 8 hours for:
  - signs of inflammation
  - infection
  - bleeding
  - leakage at insertion site
  - length of PICC
  - secure sutures/securement device
- Report any concerns to the physician. **Home Care**: Educate the client /family to recognize and report any of the above symptoms to their nurse

3.6. **Catheter Securement**
- PICC must be stabilized with sutures or stabilization device.
- If PICC migrates externally it should not be advanced back into the vein. The PICC should be stabilized at the point of external migration and assessed by physician/ Medical imaging prior to further use.

3.7. **Catheter Damage**
If the PICC line becomes damaged, immediately clamp the line between the break and the chest wall to prevent air embolism or bleeding from the device. Notify the physician immediately.

4. PROCEDURES

4.1. Assessing PICC patency – Assess PICC function by aspirating for blood return and flushing prior to each intermittent medication or intermittent infusion or when clinically indicated with continuous infusions. Exception: Acute Care Pediatrics/PICU small lumen (3 Fr. and under) where no blood withdrawal or blood infusion is recommended.

4.1.1. Supplies
- 10mL syringe prefilled with 0.9% Sodium Chloride
- Alcohol swabs
- CVC Adult, Pediatric or PICU Standards (Appendix A, B & C) for flush volumes

4.1.2. Perform hand hygiene.

4.1.3. Clean needleless adapter for 15 seconds using an alcohol swab and friction in a twisting motion. Allow to dry.

4.1.4. Attach 10mL syringe prefilled with 0.9% sodium chloride

4.1.5. Gently flush lumen with 1-2 mLs of 0.9% sodium chloride.

4.1.6. Gently aspirate the PICC for blood return.

4.1.7. Flush the lumen with saline using stop and start flush technique.

4.1.8. Administer medication/infusion.

4.1.9. Following medication administration, flush lumen as per Standards (Appendix A, B & C)

4.1.10. Perform hand hygiene following the procedure.

4.2. Flushing

4.2.1. Flushing is performed on PICCs that are used intermittently (not connected to a running infusion), following each access. If the PICC is not routinely accessed then these lumens are flushed on a schedule specific to each type of PICC (Adult/Pediatric/PICU Standards - Appendix A, B & C).

4.2.2. Supplies
- 10mL syringe prefilled with 0.9% Sodium Chloride (1 for each lumen to be flushed)
- Alcohol swabs
- CVC Adult, Pediatric or PICU Standards (Appendix A, B & C) for flush volumes

4.2.3. Perform hand hygiene

4.2.4. Clean needleless adapter for 15 seconds using an alcohol swab and friction in a twisting motion. Allow to dry.
4.2.5. **Flush**: Attach 0.9% Sodium Chloride flush syringe, inject the required volume and remove the syringe:
- after blood withdrawal, before and after medication administration, for maintenance of an unused lumen
- using a stop and start flush technique

**Note:** A pulsatile flushing technique of 10 short boluses of 1 mL interrupted by brief pauses may be effective at removing solid deposits.
- Do not use force to flush or lock a PICC.

4.2.6. Repeat the procedure for other lumens as necessary.

**Note:** Use a separate flush syringe for each lumen.

4.2.7. Perform hand hygiene following the procedure.

4.2.8. Documentation:
- Record fluid volumes as appropriate on Fluid Balance Record.

4.3. **Tubing and Adapter Change**

4.3.1. **Supplies:**
- alcohol swabs
- primed needleless adapter
- primed tubing
- 10mL syringe prefilled with 0.9% Sodium Chloride (1 for each lumen)
- Luer lock plug (Home Care)
- Tubing change sticker
- Clean gloves

4.3.2. Perform hand hygiene and apply clean gloves

4.3.3. For tubing change, stop IV infusion.

4.3.4. For clamped (or non-valved) PICC, clamp lumen to prevent air embolism or blood loss.

4.3.5. Clean needleless adapter or tubing connection where the hub meets the lumen for 15 seconds using an alcohol swab and friction in a twisting motion. Allow to dry.

4.3.6. Loosen connection to facilitate rapid change over. If difficult to loosen, use a tourniquet or glove for improved grip. Do not use metal forceps as this could damage the catheter hub.

4.3.7. Disconnect tubing or adapter.

4.3.8. Clean PICC line end with new alcohol swab. Allow to dry.

4.3.9. While maintaining aseptic technique to avoid catheter contamination, connect new primed tubing or adapter.

4.3.10. Unclamp catheter and re-establish IV infusion if applicable.
4.3.11. Flush unused lumens according to CVC Standards (Appendix A, B & C).

4.3.12. Remove gloves and perform hand hygiene following procedure.

4.3.13. Document date of tubing or adapter change on care plan or other appropriate document. Write date changed on tubing change sticker and attach to tubing.

4.4. **Dressing Change**

4.4.1. Supplies:
- dressing tray/set (if needed)
- clean gloves
- sterile gloves
- 0.9% Sodium Chloride (for skin cleansing if required)
- sterile cotton tipped applicators (if required)
- 2% Chlorhexidine 2%/Alcohol 70% - swab sticks for skin disinfection
- Sterile transparent semi permeable or sterile gauze dressing
- Catheter stabilization device if used
- tape if needed
- stabilization device if used (Sku:217135)
- Alcohol based hand sanitizer

4.4.2. Perform hand hygiene and don clean gloves.

4.4.3. Remove dressing.

4.4.4. If stabilization device is present, use alcohol swabs to ease removal.

4.4.5. Discard gloves and dressing.

4.4.6. Perform hand hygiene.

4.4.7. Inspect insertion site for:
- signs of infection or inflammation
- secure sutures or stabilization device in place
- catheter slippage/movement
- leaking IV fluid
- pain or swelling in arm
Notify physician promptly if any of the above are noted.

4.4.8. If drainage is present, cleanse skin and catheter with 0.9% Sodium Chloride using aseptic technique.

4.4.9. Disinfect skin with 2% Chlorhexidine/Alcohol 70% swab stick applicator. With the first swab stick, using friction, clean around the exit site of catheter and area where dressing is to be placed using a back and forth motion for 15 seconds. Flip the swab stick and moving in opposite direction clean site for another 15 seconds. With the second swab stick, cleanse length of exposed catheter. For patients less than 2 months old wipe off chlorhexidine after 30 seconds with sterile 0.9% Sodium Chloride.
4.4.10. If there is a contraindication to chlorhexidine, providine-iodine or 70% alcohol can be used as alternatives.

   **Note**: PICC material can be damaged with adhesive removers and acetone

4.4.11. Allow skin to air dry completely.

4.4.12. Apply skin protectant to area for irritated or fragile skin and if catheter stabilization device will be used (using aseptic technique and avoiding the insertion site).

4.4.13. Perform hand hygiene.


4.4.15. Apply new catheter stabilization device if catheter is not sutured in place (follow manufacturer’s directions for use.)

4.4.16. Apply transparent semipermeable dressing to cover both the insertion site and sutures/securement device. Lay dressing in place and mold it over the catheter with fingertips starting at the insertion site. Do not stretch dressing over skin surface. Slightly overlap the border tabs under hub of lumens. Press transparent portion of dressing into place. Add adhesive strips to stabilize PICC and to label dressing change date. Apply gentle pressure to entire dressing to ensure optimal adhesion.

4.4.17. If using plain sterile gauze, secure with a full border of tape or cover with transparent dressing.

4.4.18. Secure tubing to the skin with supplied tape strips to prevent traction on the dressing or insertion site.

4.4.19. Remove gloves and perform hand hygiene.

4.4.20. Document dressing change and condition of insertion site on appropriate record.

**Other CVC policies:**

#1086 Central Venous Catheters – Short Term, Tunneled, Implanted - Care of
#1042 Central Venous Catheters – Blood Withdrawal (PICC, Short Term, Tunneled, Implanted)
#1003 Central Venous Catheters – Peripherally Inserted Central Catheters (PICC) Removal
5. REFERENCES


Technical Services - MicroClave® Neutral Displacement Connector Change Recommendations. ICU Medical Inc.
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

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) – GLPN certification for this Additional Competency is under review by the SHR Nursing Practice Committee. GLPNs will not be certified until the review is completed.

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) – LPN certification for this Additional Competency is under review by the SHR Nursing Practice Committee. As assigned, currently certified LPNs may continue to withdraw blood from Central Lines. LPNs requiring initial certification will not be certified until the review is completed. Prerequisite: LPN must have completed SaskPolytechnic IV Therapy/Blood & Blood Products Completer Course or equivalent.

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.

6. PURPOSE

6.1. To safely obtain high quality blood specimens for lab testing from central venous catheters.

6.2. To minimize the risk of infection, damage, displacement and other complications associated with the use of CVCs.

7. POLICY

7.1. Practitioner Order required

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

7.2. 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

7.3. 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)
7.4. **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

7.5. **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

7.6. **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).

8. **PROCEDURES**

8.1. **Blood Withdrawal**

8.1.1. **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
**Policy & Procedure: Central Venous Catheter - Implanted Ports**

**Accessing and Discontinuing Access**

- 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

8.1.2. 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.

8.1.3. Perform hand hygiene and apply clean gloves

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

8.1.5. 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 needleless 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

8.1.6. 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.

8.1.6.1. If using syringe method, pull back on the syringe 1 mL 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 hemolysis 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.
8.1.6.2. 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.

8.1.7. **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.**

8.1.8. Resume IV infusions if applicable.

8.1.9. Clean tops of blood filled specimen tubes with bleach swab or Percept.

8.1.10. 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.

8.1.11. Remove gloves and perform hand hygiene

8.1.12. **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
9. REFERENCES


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


DEFINITIONS:

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

Implanted Port - a port that is surgically placed in the chest or arm. It is used for long-term venous access for infusion of medications, parenteral nutrition, IV solutions, administering blood and blood sampling. It is accessed with a non-coring needle.

ROLES:

Graduate Nurses (GNs) - GNs who have been identified by their manager in targeted practice settings may be certified in this RN Specialty Practice (RN Procedure): Central Venous Catheter – accessing and discontinuing access of implanted ports. The Grad Nurse may only access and discontinue access of implanted ports under the direct supervision of a certified RN

Registered Nurses (RNs) – RNs identified by their manager in targeted practice settings will be certified in this RN Specialty Practice (RN Procedure): Central Venous Catheter – Accessing and Discontinuing Access of implanted ports

1. PURPOSE

1.1 To maintain patency and minimize the risks of infiltration, infection, septal damage and other complications associated with the care and use of implanted ports.

2. POLICY
2.1 The RN/Grad Nurse certified in this RNSP will have first completed the following learning modules/activities prior to accessing and discontinuing access to implanted ports independently.

- Complete the required learning module and quiz (teaching and learning methods may vary e.g. classroom and/or self-study using paper module or online)
- Complete a skills checklist with a certified RN during simulation or during first access, to ensure safety checks are followed appropriately.
- Provide documentation of learning module quiz and skills checklist to educator/supervisor

2.2 Use only non-coring needles to access the port. Non-coring needles have a deflected point that avoids damage to the septum.

**Note:** Regular needles will damage the septum.

*See appendix D for instructions on using the non-coring safety needles*

[Click here for access to brochure on line]
[Click here for Gripper Plus instruction video on line]
[Click here for Gripper Micro instruction video on line]

2.3 Once the port is accessed, the needle may remain in the port up to 7 days. Needleless adapter if used is changed every 7 days, with the needle and extension tubing.

2.4 To prevent peripheral port occlusion and/or damage, avoid using an arm that has an implanted port for BPs or venipuncture.

2.5 If implanted port is accessed for continuous use, dress with a transparent semi permeable dressing

2.6 Implanted ports can be used for all types of intravenous therapy, including infusion of blood products, parenteral nutrition, and infusion of chemotherapy agents as well as for blood sampling.

3. PROCEDURE

3.1 Accessing:

3.1.1 If ordered, apply anaesthetic cream to the skin over the port, 15 minutes in advance of procedure.

3.1.2 Supplies:

- anaesthetic cream (optional)
- dressing tray/set
- sterile gloves
- Chlorhexidine/alcohol - swab or swabstick
- 2 - 10mL syringes prefilled with 0.9% Sodium Chloride
- appropriately sized non-coring needle with extension tubing
- transparent semi permeable dressing
- Needleless adapter (if not included with non-coring needle set)
- Alcohol based hand sanitizer
3.1.3 Prior to accessing CVCs for any reason, nurses must perform hand hygiene for at least 15 seconds with alcohol-based hand rub or antiseptic soap and water.

3.1.4 Palpate the port to identify the septum. Report to physician any rotation or migration of port or any abnormal skin condition.

3.1.5 Open dressing tray. Add non-coring needle.

Note: Choose non-coring needle length (3/4 – 1 1/2) depending on the size of the port and the amount of subcutaneous tissue overlying the port. Ideally the bend in the needle rests on the skin when the port is accessed.

3.1.6 Disinfect skin over port with 2% Chlorhexidine/Alcohol 70% swab stick applicator. Using friction clean using a back and forth motion for 15 seconds. Flip the swab stick and moving in opposite direction clean area using a back and forth motion for another 15 seconds. For patients less than 2 months old wipe off chlorhexidine after 30 seconds with sterile 0.9% Sodium Chloride. Allow to dry completely.

3.1.7 While being careful not to contaminate the non-coring needle, attach saline filled syringe and prime with saline. Leave syringe attached to tubing.

Note: Acute Care Pediatrics attaches a needleless adapter for all IV infusions

3.1.8 Don sterile gloves.

3.1.9 Remove needle cover.

3.1.10 With non-dominant hand, locate port by palpation and secure between thumb and index finger.

3.1.11 Insert non-coring needle perpendicular to the port septum and push it firmly through the skin and septum until needle touches the bottom of the port.

Note: Once the septum is punctured, the needle should not be tilted or rocked; these actions may cause fluid leakage, extravasation and damage to the septum.
See Appendix D for manufacturers’ instructions for use of Gripper Plus or Gripper Micro needles (activation of safety component on insertion or removal of needle is different for each type). Please see online links in 2.2

3.1.12 Verify correct needle placement by gently withdrawing on the syringe to assess for blood return.

**Note:** If unable to withdraw blood:
- make sure needle is at the bottom of the port
- reposition patient or ask to cough
- flush gently with saline
- if still unable to aspirate, remove needle and reattempt access using a new non-coring needle
- if still unable to aspirate, report to physician (a referral may be made to Medical Imaging for a port contrast injection under fluoroscopy)

3.1.13 Flush with saline (See Appendix A, B, C for flush amounts) using a stop and start motion to create a turbulent flow to clear all blood from the extension tubing, port and catheter. Observe for ease of flushing and any sign of subcutaneous infiltration. Clamp extension tubing, leaving syringe attached.

3.1.13.1 For continuous use of port, apply transparent dressing to cover the access site and to stabilize the needle in the port.

3.1.13.2 For blood withdrawal, or other intermittent use, attach needleless adapter.

3.1.13.3 For continuous medication/fluid administration attach appropriate tubing.

**Note:** Acute Care Pediatrics attaches a needleless adapter for all IV infusions

**Note:** Clamp extension tubing during tubing or adapter changes to prevent air embolism or blood loss.

3.2 Blood Withdrawal

3.2.1 Refer to policy: Central Venous Catheters – Blood Withdrawal #1042

3.3 Flushing and Heparin Locking

3.3.1 Refer to policy: Central Venous Catheters – Care of #1086. See attached Adult/Pediatric Standards (Appendix A, B & C) for amounts of flush.

3.4 Discontinuing Access

3.4.1 Ensure port is locked with heparin prior to removal of the needle.

3.4.2 Perform hand hygiene and don clean gloves.

3.4.3 Remove dressing.

3.4.4 Remove needle according to manufacturer’s instructions (see Appendix D).

**Note:** Please see online links in 2.2

3.4.5 Cleanse the site with Chlorhexidine and allow to dry.

3.4.6 Apply a bandaid if required.
3.5 **Documentation**

3.5.1 Record Heparin administration on appropriate record.

3.5.2 Record fluid volumes as appropriate on In/Out Record

**Other CVC policies:**

#1086 Central Venous Catheters – Short Term, Tunneled, Implanted - Care of
#1042 Central Venous Catheters – PICC, Short Term, Tunneled, Implanted – Blood Withdrawal

4. **REFERENCES**


doi:1

Technical Services - MicroClave® Neutral Displacement Connector Change Recommendations. ICU Medical Inc.


DEFINITIONS:

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

Client: term used to refer to a client, patient or resident

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).

ROLES:

Graduate Nurses (GNs) - GNs who have been identified by their manager in targeted practice settings may be certified in this RN Speciality Practice (RN Procedure): Central Venous Catheter - Short Term Removal. The Grad Nurse may only remove a Short Term CVC under the direct supervision of an certified RN

Registered Nurses (RNs) – RNs identified by their manager in targeted practice settings will be certified in this RN Specialty Practice (RN Procedure): Central Venous Catheter – Short Term - Removal

1. PURPOSE

1.1 To minimize the risks of hemorrhage and air embolism associated with the removal of a Short Term CVC.

2. POLICY
2.1.1 The RN/Grad Nurse certified in this RNSP will have first completed the following learning modules/activities prior to accessing and discontinuing access to implanted ports independently:
- Attended an educational session on removal of a Short Term Central Line,
- Completed the learning package and quiz and returned it to the CNE
- Complete a skills checklist with a certified RN during first access, to validate and ensure safety checks are followed appropriately.

2.2 A physician’s order is required to remove a short term CVC.

2.3 Physicians and nurses will assess the need for short term CVC on a daily basis. The CVC should be removed when it is no longer needed for the client’s plan of care.

2.4 Removal will be done using aseptic technique.

2.5 Catheter tip is not routinely cultured.

3. **PROCEDURE**

3.1 Supplies:
- Chlorhexidine/alcohol - swab or swabstick
- dressing tray/set
- disposable stitch cutter or suture scissors
- sterile gauze
- sterile occlusive dressing, e.g. 4-sided Elastoplast bandage
- clean gloves
- Face mask/shield
- sterile scissors, sterile specimen container, requisition and labels (if tip is to be cultured)
- Alcohol based hand sanitizer

3.2 Verify client identity and explain the procedure.

3.3 **Position client supine with head of bed flat** (or Trendelenburg if client tolerates).

3.4 Perform **Hand Hygiene**: (See Infection Prevention & Control policy 20-2020-20).

3.5 Place sterile field to receive catheter if tip culture is planned.

3.6 Turn off IV infusions.

3.7 Apply face mask/shield and clean gloves.

3.8 Remove dressing and stabilization device if present.

**Note**: remove stabilization device using alcohol swabs to loosen.

3.9 Cleanse insertion and suture sites with Chlorhexidine swab or swabstick. Using friction clean around the catheter in a back and forth motion for 15 seconds, then in the opposite direction for 15 seconds. Allow to dry.
3.10 Remove sutures, if present.

3.11 Cover the exit site with gauze and apply gentle pressure while removing the catheter in a slow, constant motion while client is exhaling.

3.12 For ventilated clients remove catheter during inspiration.

   **Note:** For non-ventilated clients, intrathoracic pressure is increased during exhalation reducing the risk of air entry on removal.

3.13 Apply pressure to insertion site with sterile gauze for at least five minutes and until bleeding is controlled.

3.14 Apply sterile occlusive dressing.

   **Note:** An occlusive dressing is used to prevent air from entering the central venous circulation.

3.15 Check catheter to ensure it has been removed intact.

3.16 If catheter infection is suspected, notify physician. Send catheter tip for culturing. Use sterile scissors to remove distal 5cm of catheter. Place in a sterile container.

3.17 Client should remain flat (as possible considering clinical condition) for 30 minutes following removal.

3.18 Assess site for signs of bleeding every 15 minutes x 2 then q 30 minutes X 2 then 1 hour later.

3.19 Watch for hematoma formation or signs and symptoms of air embolism.

3.20 Leave dressing in place for at least 24 hours.

3.21 Document on appropriate record:
   - condition of insertion site
   - condition of CVC (tip intact)
   - whether CVC tip sent for culture
   - client response to procedure

3.22 Report to physician:
   - complications during removal
   - if tip not intact
   - if bleeding not controlled after 5 minutes
4. REFERENCES


DEFINITIONS

**Client** - term used to refer to a client, patient or resident

**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.

ROLES:

**Grad Nurse (GN)** - who has the knowledge and skill may remove a PICC line under direct supervision by an RN supervisor until deemed competent to complete procedure autonomously.

**Graduate Licensed Practical Nurses (GLPNs)** — GLPNs identified by their manager in targeted practice settings will be certified in this LPN Additional Competency Central Venous Catheter – Short Term - Removal. Following certification, GLPN may perform removal of a PICC line only with the direct supervision of an RN or LPN who is certified in the procedure.

**Licensed Practical Nurses (LPNs)** — LPNs identified by their manager in targeted practice settings will be certified in this LPN Additional Competency Central Venous Catheter – Short Term - Removal. **Prerequisite**: LPN must have completed SaskPolytechnic IV Therapy/Blood & Blood Products Completer Course or equivalent.

**Registered Nurse (RN)** who has the knowledge and skill can remove a PICC line.

1. **PURPOSE**

   1.1 To remove the peripherally inserted central catheter safely.

2. **POLICY**

   2.1 A physician’s order is required to remove a PICC.

   2.2 Never stretch the PICC or use excessive force to remove the catheter as this tension could cause the catheter to break.
3. PROCEDURE

3.1 Supplies:
- protective pad
- Chlorhexidine/alcohol - swabstick
- dressing tray/set
- disposable stitch cutter or suture scissors
- sterile gauze
- bandaid
- clean gloves
- face mask/shield
- sterile scissors, sterile specimen container, requisition and labels (if tip is to be cultured)
- Alcohol based hand sanitizer

3.2 Perform hand hygiene.

3.3 Verify client identity and explain the procedure.

3.4 Position client supine and position the arm with the PICC at a right angle to the body. Place protective pad under arm. Avoid handling the upper arm, which may stimulate venous spasm.

3.5 Perform hand hygiene.

3.6 Place sterile field to receive catheter if tip culture is planned.

3.7 Turn off IV infusions.

3.8 Apply face mask/shield and clean gloves.

3.9 Remove dressing and stabilization device if present.

   **Note:** remove stabilization device using alcohol swabs to loosen.

3.10 Cleanse insertion and suture sites with Chlorhexidine swab or swabstick. Using friction clean around the catheter in a back and forth motion for 15 seconds, then in the opposite direction for 15 seconds. Allow to dry.

3.11 Remove sutures if present.

3.12 Grasp the PICC near insertion site and pull with gentle, constant traction. There should be little resistance. As the PICC is removed, regrasp near the insertion site for better control and to minimize stretching of the catheter. Avoid handling upper arm.

   **Note:** If resistance, reposition arm and reattempt removal.

   **Note:** Although not common, basilic or cephalic venous spasm may cause resistance to PICC removal. Secure PICC with tape to maintain gentle traction. Apply warm compresses to the entire arm and attempt removal again in 30 minutes. If unable to remove after 30 minutes, contact the physician. A referral to Medical Imaging may be required.

3.13 After PICC is removed, apply gentle pressure with sterile gauze over insertion site to control bleeding.
3.14 Apply bandaid over the insertion site.

3.15 Check catheter to ensure entire length has been removed and that tip is intact.

3.16 If catheter infection is suspected notify physician. Send catheter tip for culturing. Use sterile scissors to remove distal 5 cm of CVC. Place in sterile container.

Home Care: transportation of specimens to lab may occur by a family member or nurse who is certified in the transportation of hazardous materials.

3.17 Remove gloves and face mask/shield and perform hand hygiene

3.18 Document on appropriate record:
- condition of insertion site
- cleaning of site
- suture/securement device removal
- ease of removal
- condition of PICC (tip intact)
- whether PICC tip sent for culture
- client’s response to procedure

3.19 Report to physician:
- complications during removal
- if tip not intact
- any bleeding or drainage from removal site

4. REFERENCES


6.0 REVIEW QUIZ

Central Venous Catheters Review Quiz

1. **Name that Line:** A central venous catheter (CVC) is a catheter that is inserted or threaded into a large central vein with the tip placed outside the right atrium, usually in the superior vena cava.

Match the central venous catheter type with the appropriate description (below) and label pictures:

A. **Short Term (percutaneous)**
   - **inserted above the elbow in radiology**

B. **Tunneled**
   - **used only in acute care because of the increased risks of accidental removal and infection**

C. **Peripherally Inserted**
   - **the port is sutured to underlying tissue to prevent rotation in the subcutaneous pocket**

D. **Implanted**
   - **a tissue ingrowth cuff on the catheter secures it in the subcutaneous tract**
2) The tip of any type of central venous catheter (CVC) is placed in the:
   a. superior vena cava, outside of the right atrium
   b. subclavian vein
   c. internal jugular vein
   d. external jugular vein

3) A CVC is used for the following: (choose all the correct answers)
   a. blood sampling
   b. PN
   c. blood products
   d. emergency resuscitation
   e. arterial blood gases

4) The smallest syringe size used for CVC flushing is:
   a. 3 mL
   b. 5 mL
   c. 10 mL
   d. 20 mL

5) Choose all the correct CVC procedures:
   a. Change needleless adapters every week
   b. Change gauze dressings every 48 hours; transparent dressings every 5-7 days
   c. Change tubing used for Parenteral Nutrition every 24 hours
   d. Place a needleless adapter on all the unused CVC lumens

6) The nurse assesses the CVC for: (choose all the correct answers)
   a. length of CVC visible from exit site
   b. intact dressing
   c. signs of infection at insertion site
   d. signs of pneumothorax

7) Which of these signs or symptoms could indicate a serious complication IMMEDIATELY following insertion of a CVC? (choose all the correct answers).
   a. sharp shoulder pain
   b. sharp chest pain
   c. blurred vision
   d. tachycardia or irregular pulse

8) Appropriate nursing actions for a suspected infected CVC include:
   a. checking patient’s temperature
   b. assessing CVC for signs and symptoms of infection (redness, swelling, warmth, purulent drainage)
   c. obtaining blood C&S and swab site for C&S
   d. sending blood for PTT and INR

9) Which of the following is an appropriate nursing action for the management of phlebitis related to a PICC?
   a. apply warm compresses to the PICC insertion site
   b. apply topical steroid cream to arm
   c. apply ice pack to arm
   d. keep arm positioned below the level of the heart
10) The three GREATEST risks for patients with a Short Term central venous catheter are:
   a. hemorrhage, fluid overload, infection
   b. fluid overload, cracked catheter, air embolus
   c. infection, hemorrhage, air embolus
   d. cardiac arrhythmia, hemorrhage, fluid overload

11) Signs and symptoms of venous thrombosis include choose all the correct answers:
   a. swelling of the neck, face, shoulder and arm
   b. mild to moderate neck pain
   c. external jugular distension
   d. labored respiratory effort

12) Any type of central vein catheter (CVC) is flushed using the following technique.
   a. remove cap, attach syringe to line and use positive pressure flush technique, clamp during last portion of flush
   b. cleanse needleless adapter, attach syringe, flush using turbulent start/stop method, clamp during last portion of flush
   c. scrub needleless adapter, attach syringe with normal NS, flush using a turbulent start/stop method, remove syringe and and if needed, flush with Heparin and clamp
   d. attach syringe to needleless adapter, flush with NS and clamp

13) In Adults the following types of Central Venous Catheters are flushed with Sodium Chloride 0.9% and Locked with Heparin Flush Solution (choose all that apply):
   a. PICC lines
   b. Short Term Lines
   c. Tunneled Lines
   d. Implanted Ports

14) In Pediatrics the following types of Central Venous Catheters are flushed with Sodium Chloride 0.9% and locked with Heparin Flush Solution (choose all that apply):
   a. PICC lines
   b. Short Term Lines
   c. Tunneled Lines
   d. Implanted Ports

15) Central Venous Catheters are flushed with a stop and start motion because:
   a. the motion helps prevent infection from developing in the line
   b. the motion helps to prevent catheter occlusion
   c. the motion helps decrease the pressure from building up in the line
   d. the motion helps decrease the side effects of certain medications

16) Describe the needleless adapter (Microclave) as used with the central venous catheters (choose the one right answer):
   a. used on all CVC connections, maintains positive pressure in the line
   b. used on all intermittently accessed CVC lines and provides neutral pressure
   c. used on all PICC lines and provides negative pressure in the line
   d. used on Implanted Ports as they require a specialized needle to access

17) A special non-coring needle is always used:
   a. to draw blood specimens from tunneled central venous catheters
   b. to access an implanted port
   c. by the physician to anaesthetize the patient's skin prior to insertion of a CVC
   d. to flush the distal lumen of a multilumen catheter
18) A client who lives in the community receives chemotherapy through an Implanted port as an outpatient. He is now hospitalized. What can you use his port for? (Choose all that apply).
   a. blood products
   b. blood sampling
   c. IV antibiotics
   d. PN
   e. Chemotherapy

19) Prior to removing a Short Term line the patient should be positioned:
   a. Supine with head of bed flat (as tolerated)
   b. flat with arm at a 90 degree angle to the body
   c. Lying flat or on left side
   d. flat with full sterile drapes

20) Following the Short Term Central Line removal assess site for signs of bleeding:
   a. after 5 minutes then every hour X 2
   b. every 15 minutes X 2 then in 1 hour
   c. every 15 minutes X2 then every 30 minutes X 2 then 1 hour later
   d. every 15 minutes X 2 then every 1 hour X 2 then after 2 hours
## 7.0 CERTIFICATION SKILL CHECKLISTS

### Removal of Short Term Line

**RNIS Certification Skill Checklist**

<table>
<thead>
<tr>
<th>Demonstrates Proper Technique of the following</th>
<th>Yes</th>
<th>No</th>
<th>Certifier Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checks for Physician order to remove short term catheter</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Gathers supplies</td>
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<tr>
<td>Completes verification of client identification</td>
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<tr>
<td>Completes client education of procedure and expectations</td>
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<tr>
<td>Completes hand hygiene and dons PPE (gloves and mask/face shield)</td>
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<tr>
<td>Remove dressing</td>
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<tr>
<td>Clean insertion site with chlorhexidine/alcohol solution</td>
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<tr>
<td>-- For sutures: clean as above before removing sutures</td>
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<tr>
<td>-- For stabilization device: remove device prior to cleaning as above</td>
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<tr>
<td>Hold gauze on insertion site and while client exhales gently pull out catheter and put pressure on area until bleeding stops for at least 5 minutes</td>
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<tr>
<td>When bleeding stops place an occlusive dressing on site</td>
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<tr>
<td>Check that catheter is intact</td>
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<tr>
<td>Send tip for C &amp;S if ordered or if there are signs of infection</td>
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<tr>
<td>Completes checks of patient every 15 x 2, every 30 X 2 and then in one hour</td>
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<tr>
<td>Documents on the procedure and reports any issues to the physician</td>
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</tbody>
</table>

Signature of Certifier: ____________________________ Date: ____________

Signature of RN/GN: ____________________________ Date: ____________
# Insertion of a Gripper Micro needle into an Implanted Port

## RNSP Certification Skill Checklist

### Demonstrates Proper Technique of the following

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Certifie r Initials</th>
</tr>
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<tbody>
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</table>

#### Insertion of the Gripper Micro
- Chooses appropriate needle gauge and length for client
- Prepares client for needle insertion
- Prepares and flushes set (needle, tubing and needleless adapter)
- Cleans insertion site with chlorhexidine/alcohol and allows to dry
- Dons sterile gloves
- Removes needle guard from needle
- Inserts Gripper micro needle into the port at a 90° angle

#### Removal of the Gripper Micro Inserter
- From the back of the inserter, places fingers on each side of the inserter, presses tab in and lifts the safety arm straight back to the lock position until audible “click” is heard
- Disposes of used inserter in a sharps container

#### Preparation of the Gripper Micro infusion site
- Verifies correct placement by aspiration of blood
- Applies a sterile transparent semi-permeable dressing over the infusion site

#### Removal of the Gripper Micro Infusion set
- Flushes and locks port as appropriate
- Places fingers on each side of the infusion site and while stabilizing the port with the other hand, lifts the infusion site straight up, discards in sharps container
- Documents on the procedure and reports any issues to the physician

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Signature of Certifier_____________________________________________ Date___________________

Signature of RN/GN _____________________________________________ Date ___________________
### Insertion of a Gripper Plus needle into an Implanted Port

#### RNSP Certification Skill Checklist

<table>
<thead>
<tr>
<th>Demonstrates Proper Technique of the following</th>
<th>Yes</th>
<th>No</th>
<th>Certifier Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Insertion of the Gripper Plus</strong></td>
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<tr>
<td>- Chooses appropriate needle gauge and length for client</td>
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<tr>
<td>- Prepares client for needle insertion</td>
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<tr>
<td>- Prepares and flushes set (needle, tubing and needleless adapter)</td>
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<tr>
<td>- Cleans insertion site with chlorhexidine/alcohol and allows to dry</td>
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<tr>
<td>- Dons sterile gloves</td>
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<td></td>
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<tr>
<td>- Removes needle guard from needle</td>
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<tr>
<td>- Inserts Gripper Plus needle into the port at a 90° angle</td>
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<tr>
<td><strong>Preparation of the infusion site</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Verifies correct placement by aspiration of blood</td>
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<td></td>
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<tr>
<td>- Removes and discards safety needle tab</td>
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<tr>
<td>- Applies a sterile transparent semi-permeable dressing over the infusion site</td>
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<tr>
<td><strong>Removal of the Gripper Plus Infusion set</strong></td>
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<tr>
<td>- Flushes and locks port as appropriate</td>
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<tr>
<td>- Places fingers on each side of the base while gently pressing down to secure portal. From behind the needle, lifts the safety arm straight back to the lock position until audible “click” is heard</td>
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<tr>
<td>- Disposes of used needle in sharps container</td>
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<td>- Documents on the procedure and reports any issues to the physician</td>
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Signature of Certifier __________________________________________ Date __________________

Signature of RN/GN ___________________________________________ Date __________________