Winnipeg Regional Health Authority / Office régional de la santé de Winnipeg Caring for Health / À l'écoute de notre santé **CLINICAL PRACTICE GUIDELINE**	**Practice Guideline** Removal of a peripheral inserted central catheter (PICC)	
	Approval Date April 2019	**Pages:** Page **1** of **7**
	Approved By: Standards Committee Professional Advisory Committee	**Supercedes:** *N/A*

PURPOSE

To provide a standardized, evidence-informed process for the safe removal of a peripherally inserted central catheter (PICC).

1. DEFINITIONS

1.1 **Peripherally Inserted Central Catheter:**
A catheter that is inserted peripherally into the basilic, cephalic or brachial vein, and then advanced so the tip is positioned in the lower third of the superior vena cava or caval atrial junction.

2. GUIDELINES

2.1 The need for the PICC should be reviewed daily.

2.2 The PICC should be removed when therapy is completed, in the presence of unresolved complications, or when deemed no longer necessary for the plan of care.

2.3 An authorized prescriber's order is required for PICC removal.

2.4 The removal of a PICC can be performed by the nurse or authorized prescriber who have received training and demonstrated competency as outlined in this guideline.

2.5 In the Community Intravenous Program, nurses may remove the PICC without an order when the nurse recognizes that the patient has used the line for purposes other than the intended use and this poses risk to the patient.

2.6 PICC removal is a clean technique.

2.7 Never pull against resistance or stretch the catheter as there is a risk of catheter breakage or vein wall damage (see Appendix A).

2.8 Air embolism during PICC removal could occur. The following interventions must be done when removing a PICC to reduce this risk:

- Positioning the patient supine (if patient is unable to lay flat raise the head of the bed until the patient is comfortable)
- Use of Valsalva maneuver
- Use of sterile petroleum based ointment
- Maintaining supine bed rest for 30 minutes post removal

2.9 Prior to the removal of a PICC from a patient who has developed a catheter related deep vein thrombosis (CRDVT), discussion with the authorized prescriber should occur. The PICC does not need to be removed if the device is functional, tip is correctly positioned, is still required for therapy, and there is absence of severe CRDVT related symptoms. It is advised that a vascular access nurse be notified to assist with decision making regarding line preservation.

2.10 Prior to the removal of a PICC from a patient who has a suspected catheter related bloodstream infection (CRBSI) discussion with the authorized prescriber should occur. Removing a PICC solely on temperature elevation alone without confirmatory evidence of catheter-associated infection is not recommended. Check with authorized prescriber about obtaining blood cultures (one set from the line and a peripheral site). It is advised that a vascular access nurse be notified to assist with this situation. If a local cellulitis is suspected at exit site take a microbial swab for culture.

2.11 Sending the PICC tip for culture should not be routinely done. Recent literature indicates that when a line infection is suspected, obtaining blood cultures from both the line and a peripheral site is a more sensitive test. If the tip is ordered for culture, refer to Appendix B.

3. PROCEDURE

Equipment:

- Two to three pair non-sterile gloves
- Two packages of sterile 2x2 non-woven gauze
- One sterile transparent semi-permeable dressing (TSM)
- One to two alcohol swabs
- One 2% chlorhexidine (CHG) with 70% isopropyl alcohol swab stick
- One sterile petroleum-based ointment
- One non-sterile waterproof pad
- One disposable measuring tape
- Microbial swab and transport media for culture if a site infection is suspected
- See Appendix B for supplies needed for culture of a suspected catheter infection

3.1 Review patient chart and reason for PICC removal. Verify authorized prescriber's order for PICC removal.	Consideration should be given to patient's coagulation status (e.g., INR, PT, PTT, platelets) prior to removal as increased time may be needed for hemostasis to occur. Discuss any concerns with authorized prescriber.
3.2 Check the patient's chart for the exact trimmed length of the PICC upon insertion.	This will be compared with the length of the PICC upon removal.
3.3 Verify correct patient using two identifiers.	
3.4 Explain procedure to patient.	
3.5 Remove IV administration set and clamp lumens if necessary. Use gloves if exposure to body fluids is likely. Dispose of IV administration set in appropriate receptacle.	If the PICC is non-valved then the lumens must be clamped prior to disconnecting from the IV administration set.
3.6 Clean working area (e.g. bedside table) with disinfectant wipe.	
3.7 Preform hand hygiene and arrange supplies	
3.8 Open sterile dressings and squeeze sterile petroleum ointment onto one of the sterile 2x2 gauze	This can be done by pushing/squeezing the petroleum ointment to the top of the package before opening and then dropping a small amount onto the gauze.
3.9 Place patient in supine position with their arm abducted out but below level of the heart	

3.10 Place a non-sterile waterproof pad underneath arm. Perform hand hygiene.	
3.11 Don non-sterile gloves.	
3.12 Remove dressing from insertion site.	
3.13 Remove PICC from stabilization device.	
3.14 Remove stabilization device from skin using an alcohol swab.	The alcohol helps to loosen the adhesive making removal easier. If a subcutaneous engineered stabilization device is in place, follow manufacturer's directions for removal.
3.15 Conduct a site assessment.	If a local cellulitis is suspected cleanse with normal saline, removing all exudate, purulent material, and necrotic tissue. Place the swab on the base of the open site and with firm pressure, rotate the swab multiple times. Send to Microbiology for culture.
3.16 Cleanse the exit site with the CHG/alcohol swab stick and allow to air dry completely, 2 minutes.	Cleanse up and down using a back and forth motion with friction. Flip the swab and cleanse the area using friction using a side to side motion. Drying time is important for antiseptic effect and to minimize skin reaction when adhesive from dressing comes in contact with antiseptic. If PICC tip is ordered to be sent for culture, refer to Appendix B for procedure.
3.17 Remove gloves and perform hand hygiene.	
3.18 Don new non-sterile gloves.	
3.19 Prior to removal, explain to patient that you will be asking them to hold their breath before the PICC is completely removed.	Ask patient to hold their breath at the **end of expiration** before the last 15cm of the PICC is removed. During inspiration, negative intrathoracic pressure can encourage air to enter the exit site and cause an air embolism. If patient is unable to cooperate with instructions or is on mechanical ventilation, remove the PICC during exhalation.
3.20 Hold sterile 2x2 gauze (without petroleum ointment) directly to exit site with non-dominant hand. With dominant hand, slowly remove catheter	If resistance is met, discontinue the procedure, secure the PICC in place and apply a sterile dressing over the site.

using gentle even pressure. As the catheter exits the site, apply firm, even, direct pressure on the exit site with the sterile gauze. Place PICC on a waterproof pad to prevent contamination of the patient care/work area.	Refer to Appendix A for troubleshooting techniques.
3.21 Apply pressure to exit site with gauze dressing until hemostasis is achieved.	Additional gauze may be needed for patients with delayed coagulation time
3.22 Once hemostasis is achieved, remove initial sterile 2x2 gauze and apply the 2x2 non-woven gauze with sterile petroleum ointment directly to the catheter exit site. Apply a transparent semipermeable (TSM) dressing to the site on top of the gauze once bleeding has stopped	Dressing should remain in place for at least 24 hours. After 24-48 hours dressing may be removed. If exit site has not closed over, cover with a sterile adhesive dressing and change every 24 hours until healed.
3.23 Measure the length of the removed PICC for comparison with the insertion record. Inspect for an intact tip and not jagged.	Any discrepancies must be reported immediately to the authorized prescriber.
3.24 Dispose of PICC into regular garbage.	
3.25 Remove gloves and perform hand hygiene.	
3.26 Leave patient in a supine position for 30 minutes post removal.	The supine position with head of bed flat is preferred to prevent an air embolus, if tolerated by the patient. If the patient is unable to lay flat raise the head of the bed until the patient is comfortable.
3.27 During this time, the patient should be observed for symptoms of air embolus.	Symptoms can include: • Shortness of breath • Chest pain • Dizziness • Hypotension • Change in level of consciousness
3.28 If an air embolus is suspected, immediately place patient on their left side in trendelenburg position, administer O2, and call for medical assistance or code team as needed. In the community setting (patient's home), call 911 and take vital signs.	Place patient in trendelenburg if not contraindicated by other conditions such as increased intracranial pressure.
3.29 For the home setting and upon removal of a PICC at point of discharge: • After the elapsed 30 minutes, place patient in the sitting position. Take vital signs on non-affected arm. The procedure is complete if the patient is asymptomatic. • Instruct the patient to monitor for signs of shortness of breath, chest pain, fever, chills,	

rigors, redness or streaking up the arm, swelling of the arm or new bleeding at the exit site and to present to a local emergency department if present.	
3.30 Document the PICC removal including: • Date and time of removal • Position of patient for procedure • The length of time the patient remained supine • Site appearance • Catheter measurement upon removal and if the tip is intact (not jagged) • Patient tolerance to the procedure • Any complications or concerns with removal process • Dressing application • If a skin swab, catheter tip or blood cultures were sent for culture • All teaching and patient instructions	Any discrepancies in measurement or if the tip is jagged must be reported immediately to the authorized prescriber.

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Appendix A

Troubleshooting Tips for Difficult PICC Removal

PICC lines should never be removed against resistance. When resistance occurs it may be for the following reasons:

- Venous spasm
- Malposition or coiling of the catheter
- Thrombus formation

If resistance is met, stop removal and try one of the following troubleshooting techniques:

Action	Rationale
Apply warm compress to the entire arm for twenty minutes.	Warmth will encourage vasodilation.
Ensure patient is placed supine (shoulders on bed) and abduct arm away from body.	This will help to straighten out the venous pathway.
Mental relaxation and distraction of patient.	Helps to decrease venous spasm.
Perform chest x-ray to assess location of catheter.	Ensure that the catheter has not coiled or knotted within the vasculature.
Cover with a sterile dressing and re-attempt after 24 hours.	Allows the vessel to relax and alleviate any possible spasm.

If the above actions are not successful, the authorized prescriber should be notified as a referral to vascular surgery or interventional radiology may be required to assist in removal.

Appendix B
Sending Catheter Tip for Culture

Equipment

- Sterile dressing tray
- Sterile microbiology container
- Equipment for removal

Prepare for PICC removal as outlined above but in addition to opening up sterile dressings, also open up a sterile dressing tray.	
Follow procedure for PICC removal as above except when removing the PICC avoid contact with surrounding skin, and place on sterile dressing tray ensuring that the tip of the catheter doesn't come in contact with the part of the PICC that was external to the patient.	Once site is dressed prepare tip for culture
Uncap culture container.	
Using sterile scissors trim catheter 5cm from the distal tip being careful only to handle the trimmed piece with sterile utensils.	
Using sterile forceps transfer the trimmed 5cm piece into the culture container and apply cap.	
Label culture container with the type of specimen, date and time of removal and initials.	

Primary Authors:

Mary Lou Waschuk RN BN, Vascular Access Nurse, Grace General Hospital
Kim Finch-Field RN CVAA(c), Vascular Access Nurse, Seven Oaks General Hospital
Tara Schmitz Forsyth RN BN CVAA(c), Clinical Nurse Educator, Home Care Community IV Program
Nancy Friesen RN CVAA(c), Vascular Access Clinician, St Boniface General Hospital
Jennifer Colvine RN BN, CVAA (c), Nurse Clinician, Manitoba Home Nutrition Program