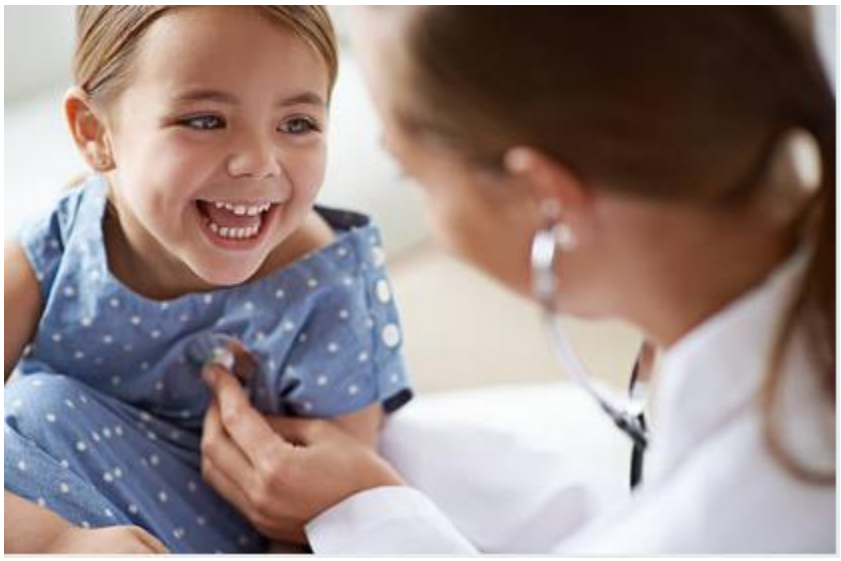
Pediatric PICC Lines in Nova Scotia:
A Resource for Nursing Care in the Home



PICC: Peripherally Inserted Central Catheter

IWK Health Centre

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Disclaimers

This PICC (peripherally inserted central catheter) resource is designed to be compatible with current policies and practices for home care nursing in Nova Scotia. However, should there be discrepancies with other nursing practice guidelines, nurses should defer to the policies and procedures for their employer or organization and/or discuss questions with their manager.

This resource was developed with the understanding that home care nurses have already received initial and ongoing certification in the care of central venous lines, including PICC lines. This resource is not a substitute for basic education on central venous lines.

This resource includes tips for the basic care of pediatric PICC lines and does not address considerations for administration of fluids and medications.

Instructions

If you have a short amount of time to review pediatric PICC line care, refer to the "Top 10 Pediatric PICC Facts - Quick Reference/Summary" on page 4.

If you're trying to troubleshoot a pediatric PICC line in the home, refer to the "Troubleshooting Algorithm" on page 10.

If you have more time, refer to the table of contents on page 3 for specific subject areas.

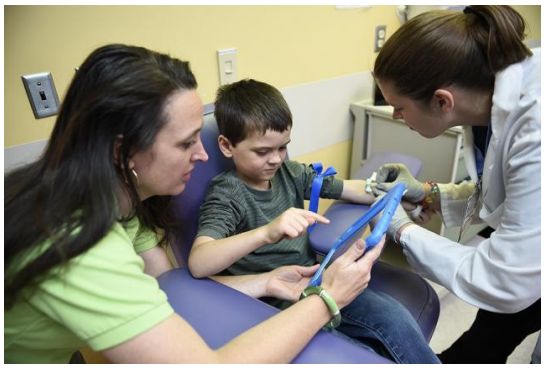
Table of Contents

Top 10 Pediatric PICC Facts – Quick Reference/Summary

1) Take time to build rapport with the patient and family; even 5 minutes can make a big difference in developing trust so you can provide PICC care more easily.
2) Most pediatric PICC lines are single lumen, and located in the arm.
3) Pediatric PICC lines need to be manually flushed every 24 hours with 10 to 20 mL of 0.9% NaCl, even when they're on a continuous CADD (continuous ambulatory delivery device) pump setup.
4) Pediatric PICC lines need to be heparin locked at least every 24 hours (+/- 4 hours) when not in use, and between mediation doses if not on a CADD pump. The orders will indicate the strength and amount of heparin.
5) Assess the line with the patient's size in mind. If a PICC line moves even 2 cm you may need to notify the physician.
6) Assess the line with the patient's risks in mind. If the patient is active, be sure the dressing and tubing are taped securely. The line may also need to be covered with long sleeves or burn net.
7) Take time to prepare and make a plan with the patient and family if you're doing a dressing change (see dressing changes - p. 8).
8) Use distraction techniques (see interaction tips - p. 5) or take a break from PICC care if the child is getting extremely anxious or fussy.
9) Pediatric PICC lines may have a higher chance of occlusion. Look for signs of sluggish flushing or blood return and notify the physician if these are present.
10) Know your resources. Know who to call and who not to call if you have questions or problems (see miscellaneous - p. 9).

Interaction Tips – General Tips, Distraction, and Procedures

- Take 5 minutes to build rapport with the patient before talking about the PICC line or medication, especially with toddlers and young children. It will save time in the end! Even if the child seems afraid, ask them about their toys, comment on their superhero or princess pajamas, or comment on their artwork you see on the fridge. Consider bringing something with you to engage the child, such as stickers or a coloring page.
- Ask the parent what has worked well when working with their child's PICC line. Prepare the parent for what you will be doing so they can be an effective support for the child. Try not to have these discussions in front of the child if possible.
- Prepare the patient by telling them ahead of time what you do, step by step. If helpful, talk through each step as you're doing it. Kids do better if they know what to expect.
- If you're doing a procedure such as a dressing change, take extra time to prepare. Talk to the parent about what works well to distract their child and come up with a plan together. Try bundling a baby or young child in a blanket, having the child sit on their parent's lap or in a special chair, having a movie for the child to watch, etc.
  Watch a video on distracting and helping children during medical procedures
- You might need to take a break from what you're doing if the child is getting extremely anxious or upset; allow them to play or do a different activity for a short time.



Distraction using a game on a tablet.

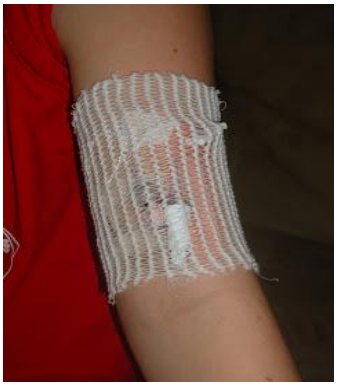
Toddler being held and comforted by his Mom during a procedure.

Infant being held and comforted by her father. If the infant had a PICC line in her right arm, that arm could be kept out from under the father's arm, making this a possible position for a PICC dressing change.

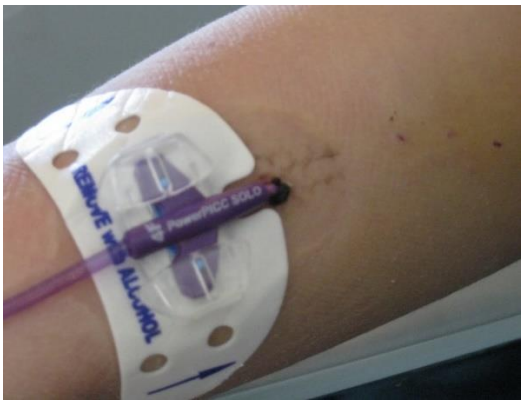
Assessment, Safety, and Preventing Dislodgement

- In pediatric patients, smaller amounts of line movement (even 2 cm) can be significant. When in doubt, notify the physician of line movement.
- Assess the external line length (from where the line enters the skin to the start of the butterfly shaped part of the line) before and after dressing changes due to the higher risk of line migration with this procedure in children.
- If a child is fussy or crying during line assessment or line use and you're not sure if it's due to pain or the child being scared, refer to the interaction tips for distraction. If the child can be distracted it is likely not due to pain.
- To prevent dislodgement, change PICC dressings as ordered and PRN, tape dressings well (but make sure you can see the site), consider using steri-strips or a Stat-Lock device for extra securement at the insertion site, and loop and tape the line outside the dressing if possible. Encourage younger and active patients to wear long sleeves or use burn net or another cover to protect the site and extension tubing. Some patients may have sutured PICC lines to help prevent dislodgement. It may also be necessary to tape connection points such as the line/cap connection point.

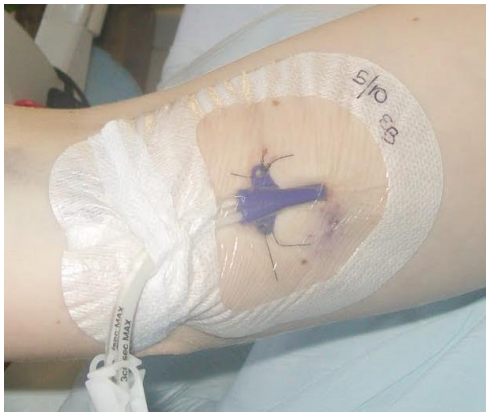
PICC line with a covering sleeve.



PICC line covered with burn net.



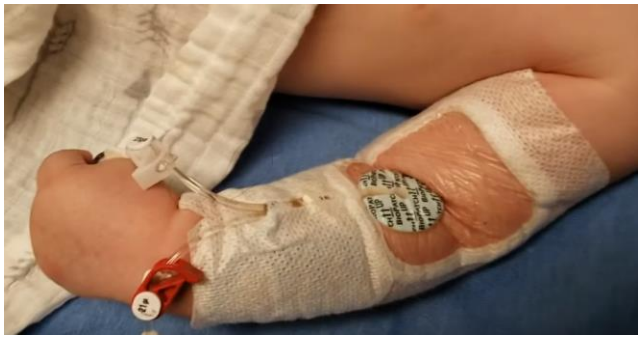
PICC line with a Stat-Lock device; needs to be covered with a dressing.



PICC line sutured in place.

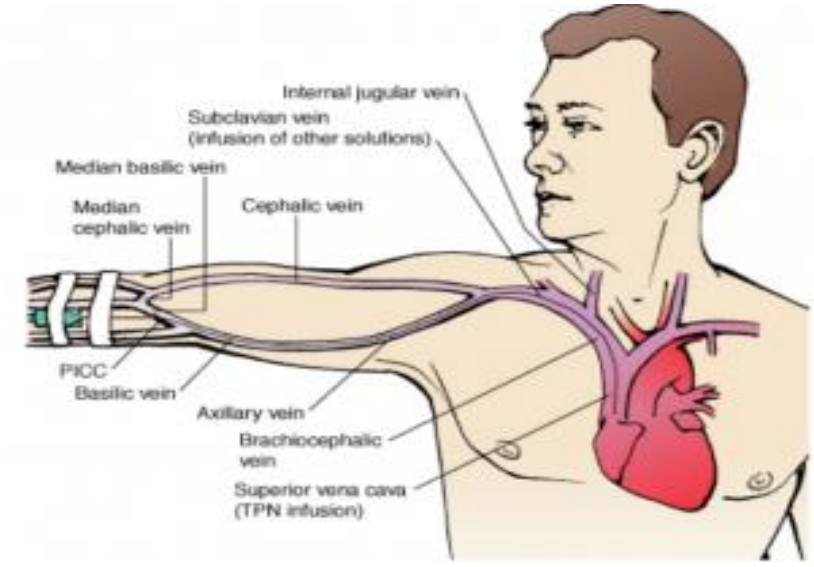
Line Types and Sites

- All pediatric PICC lines used in the home can be used intermittently because they are size 3F or larger (i.e. Continuous infusion is not required).
- Pediatric PICC lines are usually single lumen but may be double lumen.
- The most common PICC site is in the arm – either the brachial, cephalic, or median cubital vein. Scalp veins or leg veins are rarely used in the home.
- Most PICC lines are central, but for most home medications (e.g. antibiotics), the line does not have to be central to be used. Line care is the same whether central or not.
- Most pediatric PICC lines used in home care are PowerPICCs, a type of line that can handle higher pressures. The care of PowerPICCs and non-PowerPICCs is the same.
- Generally, PICC lines used in the home are not in place long enough for children to outgrow them. The IWK team is responsible for monitoring this possibility.



Double lumen PICC line in a baby's arm.

Baby with a scalp PICC (this is rare in the home).



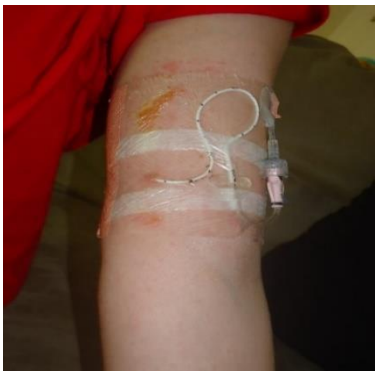
Common PICC sites in the arm.

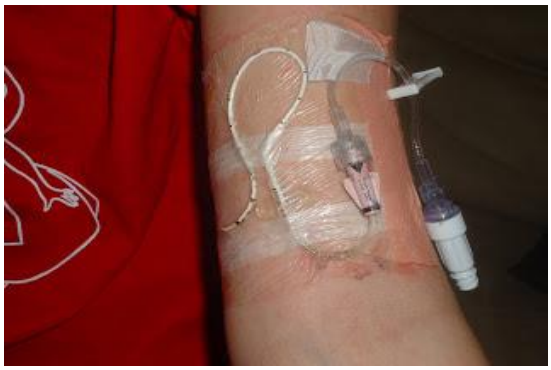
Manual Flushing and Heparin Locking

- Pediatric PICC lines must be flushed manually at least every 24 hours with 10 to 20 mL of 0.9% NaCl. This is needed if using a CADD pump, other pump, or gravity administration, or if the line is not being otherwise used. A 10 mL volume flush is adequate for infants, toddlers, and preschoolers. A 20 mL volume flush is used for schoolchildren and teens.
- Flush with an extra 10 to 20 mL of 0.9% saline after a blood draw to ensure a clear line.
- Always use a brisk turbulent flush technique for pediatric PICCs (i.e. Push-pause flush). Watch a video demonstrating the push-pause technique.
- Pediatric PICC lines must be heparin locked at least every 24 hours (+/- 4 hours) when not in use, and as needed between medication doses.
- Heparin 10 u/mL or 100 u/mL will be ordered; the orders may note that Heparin 100 u/mL can be used (at the same 2 mL volume) until the lesser strength is ordered in.
- It is not necessary to discard indwelling heparin locks (either 10 u/mL or 100 u/mL).
- Use 10 mL size syringes when flushing pediatric PICC lines.

Caps and Dressings

- In patients < 1 year old, PICC dressings may only be changed as needed (i.e. when lifting or soiled) due to the higher risk of catheter migration with dressing changes.
- In most pediatric patients, PICC dressings are changed weekly and as needed.
- The same securement devices used for adults can be used for pediatric patients (e.g. Stat-locks, steri-strips, Tegaderm, IV 3000, medical tape such as Transpore, etc).
- In pediatric PICC lines, caps are always changed weekly and as needed (i.e. when not able to be cleared of blood or medication) regardless of patient age.
- Use neutral displacement caps for all PICC lines (positive flush/clamp is not required).
- In patients with a limited ability to cooperate with dressing changes, take time to plan accordingly (see interaction tips – p. 5) and consider measures for line securement (see assessment, safety, and preventing dislodgement – p. 6).
- With rare, unique safety challenges, it may be necessary to reassess staffing needed to assist with dressing changes (see troubleshooting algorithm - p. 10).



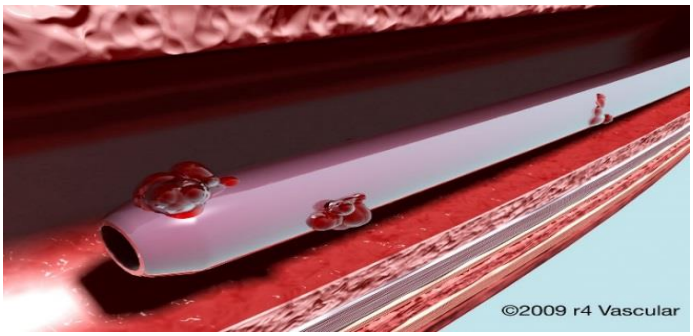


A PICC line dressing with a steri-strip loop under the dressing and a taped loop outside the dressing. It would be rare for this much catheter to be exposed in a PICC line used at home, but it is a good dressing example.

Partial and Total Occlusions

- Mechanical obstruction may happen more easily in smaller pediatric PICC lines. Troubleshoot the same way as with any PICC line by looking for kinked or clamped tubing, asking the patient to change position, getting the patient to cough, etc. For infants, it may be necessary to make them cry since they can't cough on command.
- Pediatric PICC lines may be more susceptible to thrombotic occlusions due to their small size, and larger PICC to vessel lumen ratio (see picture below).
- Do not hesitate to call the physician if you note sluggish flushing or blood withdrawal – early treatment may prevent total occlusion.

Occluded PICC line.



Pediatric PICCs may have less blood flowing around them due to a larger PICC to vessel lumen ratio, increasing the risk of clots.

Miscellaneous

- The order sheet and service plan will list the physician/team to call for medical management of the PICC line. This is often infectious diseases (ID) or another specialty service. They are available 24/7 by calling the IWK switchboard at 902-470-8888.
- The family physician, IWK inpatient units, and IWK pharmacy are not appropriate resources for home care nursing.
- There is a central venous line nurse at the IWK who is willing to help home care nurses troubleshoot PICC lines. (Available Monday to Friday, and can be paged via the switchboard at 902-470-8888).
- For general, non-urgent pediatric advice, you can reach out to the Discharge and Continuing Care Liaison for IWK. (Available Monday to Friday at 902-717-0554).
- PICC lines are always removed at the IWK, arranged by the attending physician/team.
- Parents are trained by IWK staff how to clamp the PICC line and cover the site with gauze in case of line breakage; they keep clamps and gauze with them at all times.
- If a patient's PICC line has an occlusive clot, thrombolytics will be administered in a hospital setting. It is the responsibility of the attending physician to arrange for this intervention once notified by home nursing staff that the line is occluded.
- CADD pumps, other pumps, and gravity infusion are safe for pediatric PICC lines.

Troubleshooting Algorithm

There's a problem with the PICC line.

- **Stay calm.**
- Use your resources.
- Consider at each step whether to involve your manager.

Can you troubleshoot?

e.g. Difficult to flush, unable to withdraw, child not cooperating with dressing change, etc.

- Troubleshoot as you would with any PICC line.
- Refer to your organizational policies and procedures.
- Call a home nursing colleague if available.
- Refer to "Pediatric PICC lines in Nova Scotia: A Resource for Nursing Care in the Home".
- Involve local Continuing Care staff if rare, unique safety challenges mean it may be necessary to reassess staffing for dressing changes.
- Call the IWK central venous access nurse for advice if she is available.

Is the issue not resolved after troubleshooting?

Is the issue not suitable for troubleshooting?
e.g. Line fracture.

- Call the IWK physician responsible for that patient's home care, **as indicated on the service plan and order sheet.**
- Do not call IWK pharmacy, IWK inpatient units, or physicians not involved with home care.

Other Considerations

- Notify your manager of any significant issues.
- For general, non-urgent pediatric advice or clarification of IWK service plans, call the IWK Discharge / Continuing Care Liaison.
- If alteplase (Cathflo) is needed, or a PICC line needs to be removed, these will **not** be done in the home. The IWK physician will arrange this with the patient and family.

Contacts

- IWK Central Venous Access Nurse (Monday to Friday): Page at 902-470-8888.
- IWK Physicians (Available 24/7): Page at 902-470-8888.
- Local Continuing Care office (Open Daily): 1-800-225-7225.
- IWK Discharge / Continuing Care Liaison (Monday to Friday): 902-717-0554.

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