



Nursing Management of Venous Access Devices: Peripherally Inserted Central Catheter (PICC)

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Peripherally Inserted Central Catheter (PICC)

- Benefits
 - Long-term access - dwell time varies (can be > one year)
 - Decreased length of stay in hospital – allows for IV therapy in non-acute settings, i.e., home care /hospice/ skilled nursing facility (SNF)
 - Cost effective compared to all other central VADs
 - Decreased infection rate, as compared with other non-tunneled CVADs
 - Patient satisfaction and comfort
 - Fewer interruptions in IV therapy



PICCs

- Risks:
 - Air embolism
 - Infection
 - Deep vein thrombosis (DVT)
 - Nerve damage
 - Increased heparin usage in some PICCs
- Other considerations:
 - Blood withdrawal can be difficult; may be dependent on catheter length.
 - Over time, multiple insertions can cause venous scarring and decrease the ability to reuse the site



PICC Characteristics

- Catheter types:
 - single lumen (SL)
 - double lumen (DL)
 - triple lumen (TL)
- Catheter sizes:
 - 2F to 6F
- Catheter styles:
 - non-power PICC
 - Power PICC®
 - saline-only or valved PICC (Solo®)
- Catheter lengths: cut to specific patient-dependent length



PICC Placement

- Placement
 - Successful placement is highly technique-dependent; requires formal training.
 - A sterile procedure performed at bedside by specially trained IV nurse or by Interventional Radiology.
 - Catheter tip location verified by chest xray (cxr) or using EKG tip positioning system (TPS) technology (see next slide).
- Contraindicated in extremities affected by
 - Axillary lymph node dissection
 - Tissue damage such as burns, cellulitis, fracture, rotator cuff tear
 - Vessel occlusion / DVT(deep venous thrombosis)/SVT(superficial venous thrombosis)
 - Dialysis catheter (AVF) in same arm
 - Vein preservation for future dialysis access needs
 - Newly implanted pacemaker or defibrillator
 - Affected arm s/p stroke
 - Arm edema/lymphedema



PICC Tip Verification

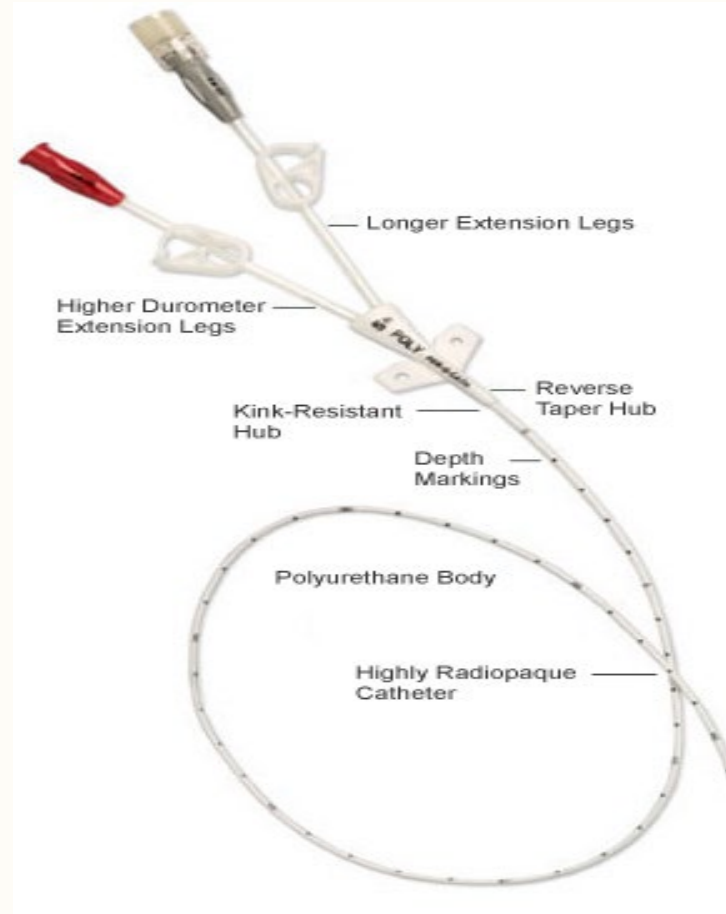
- Via Chest Xray (cxr):
 - CXR is done when P waves on EKG are not present, identifiable, or consistent.
 - Patient is < 18 years of age
 - Verbiage in “Line Properties” section of procedure note: “Placement Verification: post intervention verification pending”
 - Verbiage at end of procedure note: “PICC tip location needs to be confirmed by chest xray due to (reason). Once cxr is read, line will require an ‘ok to use’ order”



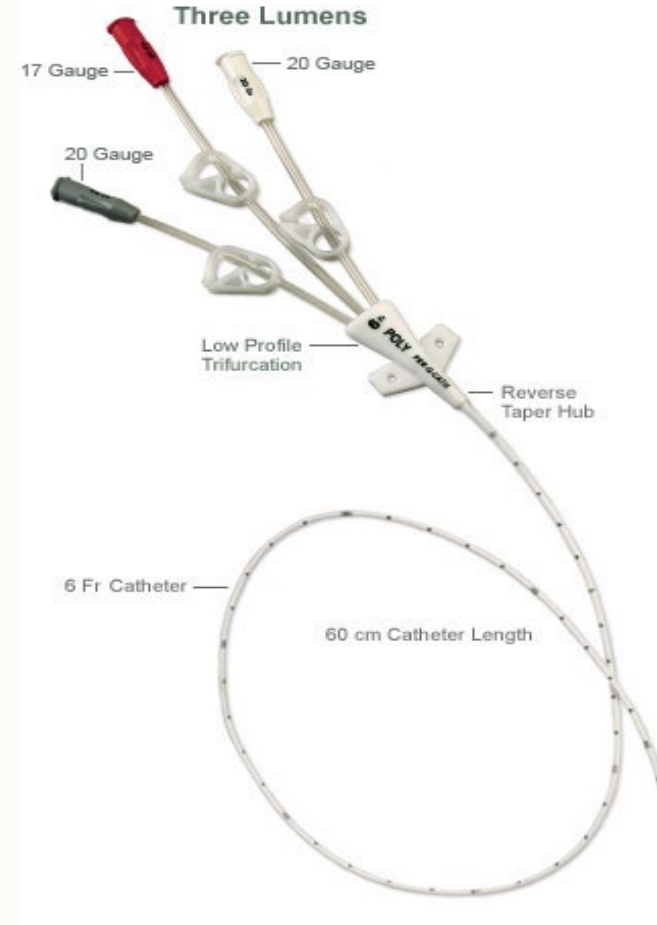
PICC Tip Verification

- Via EKG Tip Positioning System (TPS) (aka 3CG):
 - EKG TPS used when P waves are present, identifiable, and consistent
 - CXR not needed for tip verification
 - Approved for patients 18 years of age and older
 - Verbiage in 'Line Properties' section of procedure note: "Placement verification: ECG done by IV nurse"
 - Verbiage at end of procedure note: "PICC tip location in the SVC confirmed by ECG technology. PICC is now ready for immediate use".

Multi-lumen PICCs



Double Lumen PICC



Triple Lumen PICC

Other PICCs



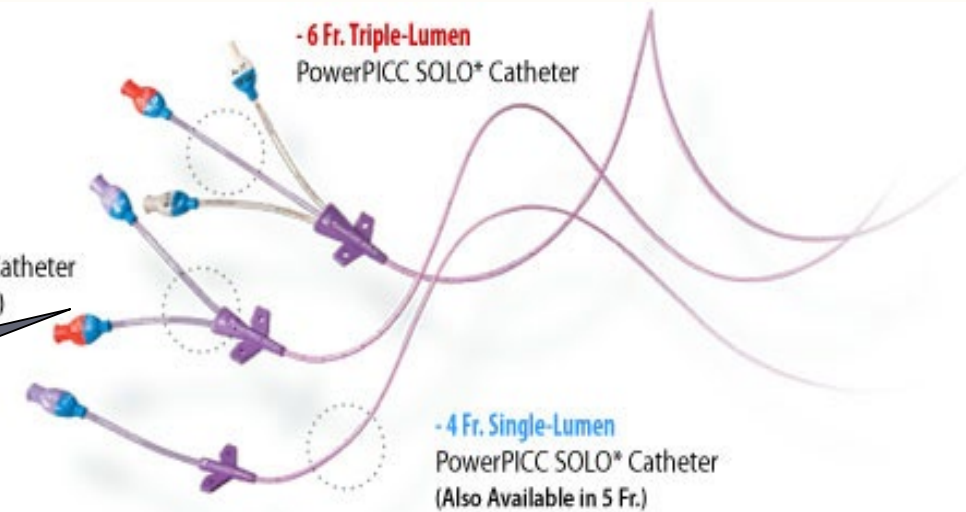
Bard
Power
PICC



Bard Solo PICC
(valved, saline flush
only PICC)

- 5 Fr. Dual-Lumen
PowerPICC SOLO* Catheter
(Also Available in 6 Fr.)

Solo PICC has
characteristic
"bubble"



- 6 Fr. Triple-Lumen
PowerPICC SOLO* Catheter

- 4 Fr. Single-Lumen
PowerPICC SOLO* Catheter
(Also Available in 5 Fr.)




PICC Assessment

- Patient comments/complaints (e.g., pain, palpitations, hears something in ear when catheter flushed)
- New cardiac irritability: CXR to verify catheter tip location
- Extremity edema
 - Is extremity cold or mottled in appearance?
 - Do arms appear to be same size? If not...
 - *Assess for dependent edema*
 - *Assess whether patient is 'favoring' that arm*
 - *Check bicep circumferences*
 - *Rule out DVT*
 - *Rule out catheter fracture*
- Catheter migration (change in external catheter length since insertion):
 - CXR to verify new catheter tip location
 - Hold central-concentration infusates until confirmation of central placement
- Consult with IV Team for any issues or symptoms

PICC Line Care: Flushing

Refer to MGH Nursing Policies and Procedures in Ellucid



<i>Type of Catheter</i>	<i>Routine Flushing</i>	<i>Frequency of Flush</i>
PICCs and power-injectable PICCs (e.g. Bard Power PICC)	Adults: 10-20ml of 0.9% saline after infusion 20-30ml of 0.9% saline after blood draw or blood transfusion	Intermittent use: After completion of any infusion or blood sampling. Maintenance: Every 24 hours when not in use.
	Adolescents: Heparin 10 units/ml; flush with 5ml (50 units).	After completion of any infusion or blood sampling, every 24 hours when not in use.
	Pedi/Toddlers/Infants: -2F catheter: Heparin 10 units/ml; flush with 1ml (10 units).	After completion of any infusion or blood sampling, every 6 hours not in use.
	-2.6F catheter or larger: Heparin 10 units/ml; flush with 2-3ml (20-30 units).	After completion of any infusion or blood sampling, every 12 hours when not in use

PICC Line Care: Flushing

Refer to MGH Nursing Policies and Procedures in Ellucid



<i>Type of Catheter</i>	<i>Routine Flushing</i>	<i>Frequency of Flush</i>
PICCs and power-injectable PICCs (e.g. Bard Power PICC)	Neonates/NICU: Single lumen PICCs are not heplocked. Unused lumens of multilumen PICCs may be heplocked in certain situations such as fluid restriction.	All neonate/NICU infusions, including central line flushes, should be administered using a pump to reduce the risk of catheter fracture.
	Heparin 10units/ml; flush with 1ml (10units)	After completion of any infusion or blood sampling, or every 6 hours



Discontinuing a PICC

- Physician/provider order required to discontinue PICC
- Procedure highlights:
 - Patient should be recumbent in bed
 - Apply slow, steady traction when sliding catheter out
 - Have patient perform Valsalva maneuver
 - Place petroleum-based ointment, a sterile gauze, and occlusive dressing over insertion site. Dressing should remain on for at least 24 hours, or longer until epithelialization occurs
 - Inspect catheter; check tip integrity and length
 - Consider tip culture if infection is suspected
- If difficulty removing catheter, apply warm compresses to arm, shoulder, and chest to decrease venospasm. If catheter remains steadfast, DO NOT FORCE. Secure catheter and notify physician.
- Refer to MGH Nursing Policies and Procedures in MGH Ellucid for full procedure



PICCs: Miscellaneous

- Maximum infusion rate: as patient condition warrants. Pump maximum infusion rate is 999 ml/hour.
- Pumps are mandatory for **any** infusion!
- NO blood pressure cuff or tourniquet on or above PICC dressing.
- A new Stat-lock securement device should be applied with dressing and needleless connector change.
- Designate and label a dedicated lumen if patient to be on TPN. Please be sure to flush and maintain prior to TPN initiation.
- For multi-lumen power PICCs, always have a power-injectable lumen available for ordered contrast studies.



References

- Original power point 2011: Bartholomay, Dreher, Theresa Evans, Susan Finn, Deb Guthrie, Hannah Lyons, Janet Mulligan, Carol Tyksienski
- MGH Ellucid
- Infusion Nurses' Society (INS), Infusion Nursing Standards of Practice, 2016