

## Guidelines for PICC Avoidance in Chronic Kidney Disease, End-Stage Kidney Disease and Renal Transplant Patients

### A.) Fistula First Breakthrough Initiative- National Coalition Recommendation for the Minimal Use of PICC Lines

Patients with Stage 3 to 4 Chronic Kidney Disease (CKD) are at risk for progression to kidney failure (end-stage renal disease (ESRD) or Stage 5 CKD). Maintaining vessel integrity is essential to provide a future dialysis vascular access for these patients. PICC lines can damage vessels and render them unusable for dialysis. The AV Fistula First Breakthrough Initiative National Coalition recommends NOT using PICC lines in patients at risk for, or with known mid-stage 3 CKD, stage 4 and 5 CKD, or end-stage renal disease. A small bore central catheter (SBCC) in the internal jugular (IJ) vessels is recommended instead, since SBCCs can last longer than PICC lines, can be easily replaced, and have fewer complications for the period of time needed (Sasadeusz et al, 1999).

When practitioners are faced with whether or not to use a PICC line in a patient with possible CKD, the Fistula First Coalition recommend that you:

1. Review each patient's estimated glomerular filtration rate (eGFR) to identify CKD and/or classify the stage.
2. Obtain a nephrology consult if CKD is present.
3. Use a small-caliber IJ instead of a PICC line for other treatment purposes.
4. Consider alternatives to PICC lines whenever possible (Saad & Vesely, 2004)
5. Refer to Stages of Chronic Kidney Disease (CKD) Table (below) to determine presence of CKD.

<b>Stages of Chronic Kidney Disease (CKD)</b>		
<b>Stage</b>	<b>Description</b>	<b>GFR (mL/min/1.73m<sup>2</sup>)</b>
1	Kidney Damage with normal or increasing GFR	≥90
2	Kidney Damage with mild decrease in GFR	60-89
3	Moderate decrease in GFR	30-59
4	Severe decrease in GFR	15-29
5	Kidney Failure	<15 (or dialysis)
	Chronic Kidney Disease is defined as either kidney damage or GFR<60mL/min/1.73m <sup>2</sup> for ≥ 3 months. Kidney damage is defined as pathologic abnormalities in blood or urine tests and imaging studies. (NKF, 2002)	

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## **B.) Guidelines for Venous Access in Patients with Chronic Kidney Disease**

Patients with an estimated glomerular filtration rate (eGFR) of less than 60 mL/min/1.73m<sup>2</sup>, or if an eGFR is not available, then a serum creatinine level of greater than 2.0 mg/dl, should undergo an expert vascular access assessment prior to placement of any vascular access device.

1. When suitable anatomy is present, the dorsal veins of the dominant hand are the preferred location for venipuncture and for immediate short-term use and selected non-injurious infusion therapies.
2. The forearm veins, upper arm veins and subclavian veins are of critical importance for creation of a hemodialysis fistula and these veins should not be routinely used for venous access procedures, including peripherally inserted central catheters (PICC). These veins should be used only when preferred veins are not available or if requirement for future hemodialysis vascular access is determined to be unlikely.
3. Alternative long-term venous access solutions should be identified and implemented as soon as possible, avoiding prolonged reliance on peripheral veins.
4. The internal jugular vein is the preferred vessel for central venous access. Central venous catheters inserted via the internal jugular vein that are intended for long-term use (>1 week) should be placed using a subcutaneous tunnel.

***Joint Position Statement, Association for Vascular Access (AVA) and American Society of Diagnostic and Interventional Nephrology (ASDIN)***

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## **C.) Vein Preservation: An Algorithmic Approach to Vascular Access Placement In Patients with Compromised Renal Function**

Recommendations to Avoid PICC Placement in CKD and Renal Transplant Patients:

1. All clinical laboratories should report GFR with the serum creatinine. This allows for an assessment of which patients are in CKD Stages 4 and 5.
2. PICCs should be avoided if GFR <30, the patient has end-stage renal disease, or the patient is a renal transplant patient.
3. Tunneled jugular lines should be placed instead of PICC lines.
4. Floor nurses should be able to place IVs for overnight infusions that are critical. If this is not possible currently, further training is needed. No patients should have an emergency PICC place. If the patient needs tunneled access, the procedures should be performed during regular

business hours. This ensures that the procedure is done in the safest manner possible and pneumothorax is avoided.

5. The need for IV therapy should be considered, particularly the critical need for IV therapy. Because catheter placement is not the responsibility of the ordering physician, there can be a tendency to over-rely on IV therapy. The practitioner should consider whether there are alternatives.
6. The PICC team should make 100% of all PICC request assessments. If the patient does not meet criteria for a PICC, referral should be made directly to the IR back-up, and a complete assessment of the patient's condition, results of physical exam, and IV access needs should be communicated at the time of referral.
7. The PICC team should assess renal function as well as prior history of venous access devices (particularly subclavian lines and pacemakers) and examine the anterior chest wall to look for visible collaterals. Communication of these findings to the IR department or back-up physician will be helpful in determining the ideal venous access device for the patient.
8. The "PICC Line Order" should be viewed as a venous access consultation. The primary consultant is the PICC team, and their back-up is the interventional radiologist or surgeon. In most cases, the PICC team will be the only consult needed, but for complex cases and cases that are better handled with devices other than PICCs the IR department or a back-up physician should be consulted.

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