



For a printable pocket-card version of the guideline, see Appendix, pages 8 and 9.

Duration of Therapy	Venous Access*
1–14 days	Peripheral Vein Availability <b>Good</b> : PIV or Midline Peripheral Vein Availability <b>Poor</b> : Midline, PICC, or CVC
15–30 days	Midline or PICC (inpatient → home-going) or CVC (inpatient only)
31–90 days	PICC or TUNN
> 90 days	PICC, TUNN, or Port

\*See page 2 and 3 for possible contraindications

## Hemodynamic Monitoring

- Pulmonary artery catheter (Swan Ganz).
- Triple lumen, open-ended, PICC line can be used for central venous pressure monitoring.

## Definitions

- **CVC** – Central Venous Catheter
  - Any catheter inserted with tip terminating in the vena cava regardless of the site of insertion or intended dwell time.
  - For the purpose of this guideline, CVC means a temporary (< 30 days) catheter inserted by physician or other credentialed provider. CVCs are inserted in the IJ, subclavian, or femoral veins.
  - Ideally, CVCs are removed within 10 days.
- **PICC** – Peripherally Inserted Central Catheter
  - A central venous catheter inserted by the vascular access team (PICC RN) or radiology team in an upper extremity with tip terminating in the window of the SVC to the cavoatrial junction.
  - Catheter is indicated for short- or long-term use.
  - Dwell time 5–90 days or longer based on functional assessment.
- **PIV** – Peripheral IV. **Midline**: 30 day dwell 8-20cm peripheral IV.
  - IV inserted by qualified personnel with or without ultrasound guidance.
  - Preferred site of insertion is upper extremity.
  - Dwell time depends on device function and patient assessment but at least 96 hours for **PIV/30 days Midline**.
- **TUNN** – Tunneled Catheter
  - A long-term central venous catheter inserted by a credentialed provider using a subcutaneous tunnel and entering the central circulation, with tip terminating in the window of the SVC and right atrium.
  - Dwell time > 30 days.
- **PORT** – Subcutaneous Access Port
  - A long-term central venous catheter completely implanted under the skin, with tip terminating in the window of the vena cava and right atrium.
  - Dwell time > 90 days.

## Possible Contraindications and Tips for Long-Term Catheters Use: PICC, Port, Tunneled

- Acutely septic or febrile within 48 hours.
- Avoid using the subclavian or a PICC in chronic kidney disease (CKD) whenever possible.
- Positive blood cultures without repeat negative blood cultures x 48 hours.
- Ipsilateral mastectomy or lymph node dissection.
- Ipsilateral AV fistula or other dialysis access.
  - Applies more to PICCs than to tunneled lines or other centrally placed lines.
- Ipsilateral PACER / AICD < 3 months old.
- Blood clot in the intended vessel, any vessel in the intended extremity, ipsilateral IJ, or SVC.
- Superior vena cava syndrome.

## Venous Access Device Selection: Categories and Specifications

Catheter Type	Uses	Duration	Advantages	Other Considerations
<p><b>Peripheral Venous Catheter or Midline</b></p> <p><i>To order, type "Peripheral" or select order sets; type in "Midline".</i></p>	<ul style="list-style-type: none"> <li>Routine IV therapy with osmolarity &lt; 900mOsm/L.</li> </ul>	<ul style="list-style-type: none"> <li><b>PIV</b> <ul style="list-style-type: none"> <li>Assessment dependent.</li> </ul> </li> <li><b>Midline</b> <ul style="list-style-type: none"> <li>30 days.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><b>PIV</b> <ul style="list-style-type: none"> <li>Bedside insertion and removal by any RN.</li> </ul> </li> <li><b>Midline</b> <ul style="list-style-type: none"> <li>PICC Nurse only.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Osmolarity &lt; 900mOsm/L.</li> <li>Non-caustic, non-hyperosmolar.</li> <li>Removal by RN.</li> </ul>
<p><b>PICC</b></p> <p><i>To order PICC: select order sets; type in "PICC". Include order sets.</i></p> <p><i>If IR to place, then type "IR Case", then, under the procedure search, enter "PICC".</i></p> <p><i>Remember to enter the number of lumens in the comments section.</i></p>	<ul style="list-style-type: none"> <li>Routine IV therapy and hypertonic/caustic solutions.</li> </ul>	<ul style="list-style-type: none"> <li>Up to 12 months or longer based on assessment.</li> </ul>	<ul style="list-style-type: none"> <li>Bedside insertion.</li> <li>Safe / few complications.</li> </ul>	<ul style="list-style-type: none"> <li>Vascular access team (PICC Team) to place. <ul style="list-style-type: none"> <li>Interventional radiology to place if recommended by vascular access team.</li> </ul> </li> <li>Asymptomatic venous thrombosis is common.</li> <li>Avoid in renal disease.</li> <li>Not ideal for same side as implanted device.</li> <li>Phenytoin should not be infused.</li> <li>Removal by RN.</li> </ul>
<p><b>Pulmonary Artery (PA) Catheter</b></p> <p><i>To order, type "PA catheter".</i></p>	<ul style="list-style-type: none"> <li>Accessory lumens used as CVC.</li> </ul>	<ul style="list-style-type: none"> <li>Remove as soon as catheter is no longer needed.</li> </ul>	<ul style="list-style-type: none"> <li>Bedside insertion.</li> <li>Hemodynamic monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>Requires physician to place and remove.</li> <li>RN with documented competency may remove.</li> </ul>
<p><b>Non-tunneled Antiseptic Coated CVC</b></p> <p><i>To order bedside insertion, type "CVC", then select "Setup for CVC Placement".</i></p>	<ul style="list-style-type: none"> <li>Routine IV therapy and caustic solutions.</li> </ul>	<ul style="list-style-type: none"> <li>Remove as soon as catheter is no longer needed <ul style="list-style-type: none"> <li>Ideally, remove within 10 days.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Bedside insertion.</li> <li>Longer duration.</li> <li>Lower colonization rate than CVC without coating.</li> </ul>	<ul style="list-style-type: none"> <li><b>Not for outpatient use but some LTAC will accept.</b></li> <li>Requires physician or other credentialed provider to place.</li> <li>Removal by RN.</li> </ul>
<p><b>Tunneled Central Venous Catheter or Power Line</b></p> <p><i>To order, type "IR case", then under the procedure search, choose "Insertion CVC Tunneled".</i></p> <p><i>Use drop down box to choose catheter and number of lumens.</i></p>	<ul style="list-style-type: none"> <li>Routine IV therapy and hypertonic/caustic solutions.</li> <li>Power injection (power line).</li> </ul>	<ul style="list-style-type: none"> <li>Indefinite.</li> </ul>	<ul style="list-style-type: none"> <li>Subcutaneous cuff seals skin after 7-10 days.</li> <li>Power injectable (power line).</li> </ul>	<ul style="list-style-type: none"> <li>Requires physician or other credentialed provider to place.</li> <li>Body image concerns for patient.</li> <li>Removal by IR provider, surgery, or interventional nephrology.</li> </ul>

### Venous Access Device Selection: Categories and Specifications (Continued)

Catheter Type	Uses	Duration	Advantages	Other Considerations
<p><b>Subcutaneous Access Port</b></p> <p><i>To order, type "IR case," then, under the procedure search, choose "Insertion CVC- tunneled w/port pump".</i></p> <p><i>Use drop down box to choose catheter and number of lumens.</i></p>	<ul style="list-style-type: none"> <li>Routine IV therapy and hypertonic/caustic solutions.</li> <li>Better for low frequency, intermittent access.</li> </ul>	<ul style="list-style-type: none"> <li>Indefinite.</li> </ul>	<ul style="list-style-type: none"> <li>No dressings.</li> <li>Unrestricted activity when not accessed.</li> </ul>	<ul style="list-style-type: none"> <li>Requires access with special, non-coring needle through skin.</li> <li>Lowest rates of bacteremia.</li> <li>Consider for solid tumor chemotherapy.</li> <li>Removal by IR staff or surgery.</li> <li>Requires maintenance catheter flush.               <ul style="list-style-type: none"> <li>See <a href="#">Pharmacy Flush/Dwell Policy</a>.</li> </ul> </li> <li>If site is closed with Dermabond®, inserting clinician must include post-care dressing instructions.</li> </ul>
<p><b>Non-tunneled Catheters Used for Hemodialysis/Apheresis</b></p> <p><i>To order bedside insertion, type "CVC", then select "Setup for CVC Placement".</i></p>	<ul style="list-style-type: none"> <li>Hemodialysis or apheresis.</li> <li>Not for routine IV therapy.</li> <li>Avoid when feasible.</li> </ul>	<ul style="list-style-type: none"> <li>≤ 2 weeks.</li> </ul>	<ul style="list-style-type: none"> <li>Bedside insertion and removal.</li> </ul>	<ul style="list-style-type: none"> <li>Requires physician or other credentialed provider to place low jugular vein.</li> <li>Preferred removal by physician or RN with documented competency.</li> </ul>
<p><b>Tunneled Catheters Used for Hemodialysis/Apheresis</b></p> <p><i>To order, type "IR case," then, under the procedure search, choose "Insertion CVC Tunneled".</i></p> <p><b>Note:</b> Your comments should include intended use (i.e., dialysis, apheresis).</p>	<ul style="list-style-type: none"> <li>Hemodialysis, apheresis, BMT.</li> <li>Not for routine IV therapy.</li> </ul>	<ul style="list-style-type: none"> <li>Indefinite.</li> </ul>	<ul style="list-style-type: none"> <li>Can be used immediately after placement.</li> <li>Large lumen for apheresis.</li> </ul>	<ul style="list-style-type: none"> <li>Low jugular vein preferred.</li> <li>Placement and removal by interventional radiology, surgery, nephrology or provider with privileges.</li> </ul>
<p><b>Ultrafiltration Catheters</b></p> <p><i>To order <b>Peripheral</b>, select Order Sets, and then type "PICC." Please enter "Peripheral Ultrafiltration Catheter" in the comment and include the order set.</i></p> <p><i>To order <b>Central</b>, type "CVC", then select "Setup for CVC Placement". Please enter "Double lumen".</i></p>	<ul style="list-style-type: none"> <li>Ultrafiltration only.</li> </ul>	<ul style="list-style-type: none"> <li>≤ 1 week.</li> </ul>	<ul style="list-style-type: none"> <li><b>Peripheral:</b> <ul style="list-style-type: none"> <li>Bedside insertion by vascular access nurse (PICC team).</li> </ul> </li> <li><b>Central:</b> <ul style="list-style-type: none"> <li>Insertion by provider with privileges.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>MRI is not safe for peripheral ultrafiltration catheters.</li> </ul>

## Central Venous Catheter (CVC) Protocols and Documentation of Procedure

### Key Aspects of Care

- Encourage ultrasound guidance for all central venous catheter placements, unless a delay would be detrimental to the care of the patient.
- Initiate the CVC insertion order set in IHIS to obtain necessary supplies, alert nursing to the pending procedure, and for the subsequent monitoring and care of the CVC.
- Print the CVC insertion informed consent to be reviewed/ signed with the patient or his/her designee.
- Document the CVC procedure in IHIS.
- Use the [CVC insertion checklist](#).

### Five-Step CVC Bundle

**Note:** Please see [OSUWMC Central Venous Catheter Insertion Checklist](#).

#### 1. Hand Hygiene and Aseptic Technique

- ✓ Perform hand hygiene, either by washing hands with soap and water or with alcohol-based hand rubs (ABHR).
- ✓ Hand hygiene should be performed before and after palpating catheter insertion sites as well as before and after inserting, replacing, accessing, repairing, or dressing an intravascular catheter.
- ✓ Palpation of the insertion site should not be performed after the application of antiseptic, unless aseptic technique is maintained.
- ✓ Maintain aseptic technique for the insertion and care of intravascular catheters.
- ✓ Wear clean gloves, rather than sterile gloves, for the insertion of peripheral intravascular catheters, if the access site is not touched after the application of skin antiseptics. Sterile gloves should be worn for the insertion of arterial, central, and midline catheters.
- ✓ Use new sterile gloves before handling the new catheter when guidewire exchanges are performed.
- ✓ Wearing two pairs of gloves, with removal of the first pair after removal of the old catheter, is helpful.
- ✓ Wear sterile gloves when changing the dressing on intravascular catheters.

#### 2. Maximal Sterile Barrier Precautions

- ✓ Use maximal sterile barrier precautions, including the use of a cap, mask, sterile gown, sterile gloves, and a sterile full body drape for the insertion of CVCs, PICCs, or guidewire exchange.
- ✓ Use a sterile sleeve to protect pulmonary artery catheters during insertion.

#### 3. Time Out

- ✓ Document adherence to the [Universal Protocol](#).

#### 4. Skin Preparation

- ✓ Prepare clean skin with an antiseptic (i.e., alcohol, or with a > 0.5% chlorhexidine with alcohol) before peripheral venous catheter insertion.
- ✓ Prepare clean skin with an antiseptic (i.e., alcohol, or with a > 0.5% chlorhexidine with alcohol) before central venous catheter and peripheral arterial catheter insertion and during dressing changes.
  - If there is a contraindication to chlorhexidine, 70% alcohol or an iodophor can be used as alternatives.
- ✓ No recommendation can be made for the safety or efficacy of chlorhexidine in infants aged < 2 months.
- ✓ Antiseptics should be allowed to dry according to the manufacturer's recommendation prior to placing the catheter.

#### 5. Catheter Site Dressing Regimens

- ✓ Use gauze or antimicrobial transparent dressing to cover the CVC catheter site. SCAP-use transparent dressing only.
- ✓ If the patient is diaphoretic or if the site is bleeding or oozing, use a gauze dressing until this is resolved.
- ✓ Replace catheter site dressing if the dressing becomes damp, loose, or visibly soiled.
- ✓ Do not use topical antibiotic ointment or creams on insertion sites due to the potential to promote fungal infections and antimicrobial resistance.
- ✓ For dialysis catheters, povidone-iodine antiseptic ointment at the HD catheter site may be used.
- ✓ Do not submerge the catheter or catheter site in water.
  - Showering is permitted but with careful steps to reduce the likelihood of infecting the catheter (e.g., protect the catheter and site with an impermeable cover during the shower).
- ✓ Replace gauze dressings used on CVC sites every 2 days/48 hours.
- ✓ Replace transparent dressings at least every 7 days, except in those pediatric patients in which the risk for dislodging the catheter may outweigh the benefit of changing the dressing.
- ✓ Replace transparent dressings used on tunneled or implanted CVC sites no more than once per week (unless the dressing is damp, loose, or soiled, until insertion site has healed).
- ✓ No recommendation can be made regarding the necessity for any dressing on well-healed exit sites of long-term cuffed and tunneled CVCs.
- ✓ Monitor the catheter sites visually when changing the dressing or by palpation through

an intact dressing on a regular basis (each shift), depending on the clinical situation of the individual patient.

- i. If patients have tenderness at the insertion site, fever without obvious source, or other manifestations suggesting local or blood stream infection, the dressing should be removed to allow thorough examination of the site.
  - ii. Encourage patients to report any changes in their catheter site or any new discomfort to their provider.
- ✓ Ensure that catheter site care is compatible with the catheter material.

## Orders

---

- Initiate CVC order set in IHIS to ensure Nursing is available and supplies are at the bedside.
- Request ultrasound machine.
- Documentation of procedure in IHIS to include:
  - Informed consent/use of CVC check list.
  - Medications used to anesthetize skin and those used to flush and dwell catheter lumens.
  - Use of ultrasound guidance.
  - Use of the 5-Step Bundle.
  - Orders placed for post-procedural care and transitional care to other units, facilities or home.
- Confirm tip in the vena cava (atrium for dialysis) prior to use either by x-ray (CVC) or by other technology (ECG) approved to determine tip location (PICC).
- Develop a plan for daily assessment and justification for CVC on rounds with the expectation that each nurse will personally assess catheter function each shift and address malfunction immediately.

## CVC Procedural Considerations and Guidelines

---

- Decisions regarding the type of device, duration of use and intended therapy and frequency of replacement should be determined on an individual basis in consultation with primary service, vascular access team, Pharmacy, IR and or surgery if needed (interprofessional team).
  - Refer to the table on pages 2 and 3 (catheter categories and specifications) for guidance with selecting the proper venous access device.
- Consider consultation with Infectious Disease if a long-term catheter is to be inserted for purposes of administering antibiotics in case an equally effective oral agent may be available.
- Choose the device with the least number of lumens needed for the therapy to decrease the opportunities to infect the device.
- Encourage the use of ultrasound guidance for all vascular access.

- Use ultrasound guided low-jugular vein site for venous access device placement unless medically contraindicated (e.g., coagulopathy, anatomic deformity).
- Informed Consent begins with documentation that the plan of care, including vascular access, has been agreed upon by the patient or his/her designee.
  - A discussion of the risks, benefits and alternatives to the catheter should happen at the credentialed provider level.
- Designate trained personnel who have demonstrated competency and proficiency to insert venous access devices.
- TPN requires a consult to nutrition and prior approval by the surgeon. Patients on TPN require multi-lumen catheters with designated lumens for TPN only.
  - See OSUWMC's [Parenteral Nutrition Policy](#).
- Patients on treprostinil or epoprostenol therapies may require multi-lumen catheters to be used in special circumstances, however not preferred.
  - Multi-lumen catheters placed for these patients should have the approval of the pulmonary hypertension physician prior to placement.
  - A dual lumen catheter with staggered ends is preferred but not necessary.
- When access for intravenous chemotherapy is needed, the credentialed provider should designate the number of lumens required.
- Remove any intravascular device as soon as its use is no longer clinically indicated.
  - Discuss this on rounds **DAILY** and document in IHIS.

## TIP Placement and Confirmation

---

- Confirm non-tunneled CVC tip location prior to use.
  - **Exception:** Patients admitted to the ED in need of emergent access with central lines already in place. Confirm tip location as soon as possible, under the direction and responsibility of the Emergency physician.
- The acceptable window of tip location for Central Venous Access is SVC to right atrium depending on the therapy.
  - Dialysis catheters should reside in the right atrium.
- Monitor CVCs inserted from the left to avoid tip perpendicular to the vessel wall.
- When catheter placement is the indication for x-ray, radiologists should comment on tip location.

- Central access placed under fluoroscopy guidance does not require initial x-ray confirmation.
- Femoral CVCs do not routinely require tip location confirmation by x-ray unless they are advanced above the diaphragm.

## Blood Sampling from Central Venous Catheters

### Blood Culture Indications

- If there is a suspected bloodstream infection related to a venous access device, send cultures from these sources:
  - **Peripheral blood and the venous access device:**
    - Use venous access device line evacuation kit with a two-bottle blood culture set, which includes an aerobic (10ml), an anaerobic (10 ml), two-bottle blood culture set from the venous access device as well as two-bottle set from a peripheral site.
  - **Line culture from second venous access device (only in the patient with more than one venous access device site):**
    - Withdraw 10 ml and inoculate only into an aerobic bottle.
    - Label with catheter site.
- A separate order is needed when AFB (TB) or fungal blood cultures are indicated.
  - Use the yellow bumble bee tube.
- See OSUWMC's [Blood Culture Policy](#).

## Indications for Replacement or Removal of Central Venous Catheters

### Indications for Removal

- When the venous access device is no longer clinically indicated.
  - If there are no signs or symptoms of infection, **NO** surveillance culturing of the catheter is necessary.
- Do not use guidewire-assisted catheter exchange whenever catheter-related infection is documented or suspected.
  - If the patient requires continued vascular access, remove the implicated catheter, and replace it with another catheter at a different insertion site.
- Do not routinely replace non-tunneled venous access device as a method to prevent catheter-related infections, i.e., do not change line every 4-5 days.
- Use guide wire-assisted catheter exchange to replace a malfunctioning catheter or to convert an existing catheter if there is no evidence of infection at the catheter site or if the patient is at high risk for complications associated with replacement of a new venous access device at a new site.

- It is recommended to use anti-infective coated catheter for guide wire-assisted catheter exchange.
- Two pairs of sterile gloves are needed.
- **DO NOT** routinely remove IVs or non-tunneled CVC on the basis of fever alone or based on time without clinical indicators.
- In the setting of limited venous access such as chronic hemodialysis, if catheter-related infection is suspected, but there is no evidence of local catheter-related infection:
  - Remove the existing catheter and insert a new catheter over a guidewire.
  - Send the distal 5-cm (2-in.) segment of the removed catheter tip for culture.
    - If the catheter culture indicates infection, removal of the newly inserted catheter may be required.
    - Further course of action should be individualized based on the clinical circumstances, preferably after discussing the case with Infectious Disease and Nephrology.

## Removal Process

- Certain catheters require removal by credentialed providers.
- See Categories and Specifications, page 2 and 3.

**Note:** Please see Mosby Skill [Central Venous Catheter: Removal](#) for additional recommendations.

## Venous Access in Patients with Chronic Kidney Disease (CKD) – “Save the Veins”

This information is designed to help providers choose the best venous access in CKD patients.

### Background

- Upper extremity veins are the “lifeline” for patients with ESRD. In addition, vein preservation is crucial for development and maintenance of future AV access in patients with CKD and those who have undergone kidney transplantation.
- Frequent venipuncture and the indiscriminate use of PICC lines or central venous catheters (CVC) can damage the veins and jeopardize future AV access construction or function. The preferred access for vein preservation and longer term access is tunneled right IJ.
- Studies have noted that PICC line complications include venous thrombosis in 23-32% of patients, central venous stenosis in 4.8%, and central venous occlusion in 2%.
- Emerging data suggest that PICC line placement in CKD patients is associated with less likelihood of a future AV access maturation.

## Recommendations for Venous Access for CKD

---

### 1. Identify

- Patients with CKD Stage 3-5 (eGFR < 60 ml/min), including ESRD patients currently receiving hemodialysis or peritoneal dialysis.
- Patients with a functional kidney transplant with eGFR < 60 ml/min.

### 2. Ascertain

- Evaluate for alternative therapy or dosing in patients who are expected to require long-term IV drug therapy (i.e., antibiotics).
- PICC line placement is **NOT** always required for patients going to long-term acute care facilities. Acceptable alternatives are:
  - Non-tunneled CVC
    - Preferred for short term, < 14 days
  - Tunneled catheter
    - Preferred for long term, > 14 days
  - Port
- If after exhausting all other access options a PICC Line is determined to be the appropriate access, approval from either the nephrology attending or fellow is required.

### 3. Choose the Right Vein

- Dorsal veins of the hand are the preferred location for peripheral venous access.
- Internal jugular veins are the preferred location for central venous access.
- External jugular veins are acceptable alternatives for venous access.
- CVCs inserted via the internal jugular vein that are intended for long-term use (> 2 weeks) should be tunneled.
- Use of subclavian veins **MUST** be avoided.

### 4. Coordinate

- Consult the vascular access team (PICC team) for all patients requiring long-term central vascular access.
  - The "PICC Line Order" should be viewed as a vascular access consultation.
- In most cases, the vascular access team will be the only consult needed, but for complex cases and cases that are better handled with devices other than PICCs, the Interventional Radiology Department should be consulted.

## Quality Measures

---

- Tip confirmed and catheter released for use by the ordering team within 2 hours of insertion.
  - For inpatients that arrive with central lines in place, catheter tip should be confirmed with chest x-ray prior to use if no documentation of tip location is available from sending facility.
- Incidence of central-line-associated bloodstream infections.

## OSUWMC Resources

---

- OSUWMC Nursing Policy- [Intravascular Access Devices: Peripheral and Central](#).
- OSUWMC Clinical Practice Alert- [Removal of Central Venous Catheters by Nursing Staff](#).

## References

---

- Centers for Disease Control and Prevention. Guidelines for the Prevention of Intravascular Catheter-Related Infections, 2011.
- National Kidney Foundation. Clinical Practice Guidelines for Vascular Access. NKF KDOQI. 2006 Updates.
- Clinical Practice Guidelines for the Diagnosis and Management of Intravascular Catheter- Related Infection: 2009 Update by the Infectious Diseases Society of America. Clinical Infectious Diseases 2009; 49:1-45.
- Infusion Therapy Standards of Practice, 2016; 39

## Guideline Authors

---

- James Joseph, MPH, BSN, RN- Vascular Access Team, UH
- Vijay Duggirala, MD- Hospitalist
- Samir Parikh, MD-Nephrology
- Joshua Dowell, MD, PhD -Interventional Radiology, UH
- Eric Elliott, MD-Interventional Radiology, UH
- Hooman Khabiri, MD- Interventional Radiology, UH East
- Julie Mangino, MD- Infectious Diseases, UH
- Christina Liscynsky, MD-Infectious Diseases, The James
- Sam Penza, MD- Oncology, The James

## Guideline Approved

---

May 31, 2016. Fourth Edition.

**Disclaimer:** Clinical practice guidelines and algorithms at The Ohio State University Wexner Medical Center (OSUWMC) are standards that are intended to provide general guidance to clinicians. Patient choice and clinician judgment must remain central to the selection of diagnostic tests and therapy. OSUWMC's guidelines and algorithms are reviewed periodically for consistency with new evidence; however, new developments may not be represented.

Copyright © 2016. The Ohio State University Wexner Medical Center. All rights reserved. No part of this document may be reproduced, displayed, modified, or distributed in any form without the express written permission of The Ohio State University Wexner Medical Center.

## Venous Access Devices

Duration of Therapy	Venous Access	
1–14 Days	Peripheral Vein Availability <b>Good:</b> PIV	Peripheral Vein Availability <b>Poor:</b> PICC, CVC, or Midline
15–30 Days	PICC– Inpatient going home Midline or CVC– Inpatient only	
31–90 Days	PICC or TUNN	
> 90 Days	PICC, TUNN, or SCAP (PORT)	
<b>Hemodynamic Monitoring</b>		
<ul style="list-style-type: none"> <li>• Pulmonary artery catheter (Swan Ganz).</li> <li>• Triple lumen, open-ended, PICC line can be used for central venous pressure monitoring.</li> </ul>		

### Definitions:

- **CVC**– Central Venous Catheter.
  - Any catheter inserted with tip terminating in the vena cava regardless of the site of insertion or intended dwell time.
  - CVCs are inserted in the IJ, subclavian, or femoral veins.
  - Ideally, they are removed within 10 days.
- **PICC**– Peripherally Inserted Central Catheter.
  - A central venous catheter inserted by the vascular access team (PICC RN) or radiology team in an upper extremity with tip terminating in the window of the SVC to the cavoatrial junction.
  - Catheter is indicated for short– or long– term use.
  - Dwell time 5-90 days.
- **PIV**– Peripheral IV
  - Dwell at least 96 hrs.
- **Midline**– Longer PIV- dwell 30 days.
  - IV inserted by qualified personnel blindly or with ultrasound guidance.
  - Preferred site of insertion is upper extremity.
- **TUNN**–Tunneled Catheter.
  - A long-term central venous catheter inserted by a credentialed provider using a subcutaneous tunnel and entering the central circulation via the lower jugular vein, the tip terminating in the window of the vena cava and right atrium.
- **PORT**– Subcutaneous Access Port.
  - A long-term central venous catheter completely implanted under the skin, with tip terminating in the window of the vena cava and right atrium.

## Possible Contraindications for Long-Term Catheters:

### *PICC, Port, Tunneled*

- Acutely septic or febrile within 48 hours.
- Avoid using subclavian or a PICC line in a chronic kidney disease (CKD) patient, if possible.
- Positive blood cultures without repeat negative cultures x 48 hours.
- Ipsilateral mastectomy / lymph node dissection.
- Ipsilateral fistula / shunt /permacath.
  - Applies more to PICCs than to tunneled lines or other centrally placed lines.
- Ipsilateral PACER / AICD < 3 months old.
- Blood clot in the intended vessel, any vessel in the intended extremity, Ipsilateral IJ, or SVC.
- Superior vena cava syndrome.

## UH Vascular Access Team

### *Contact Information*

- M-Sat 7am-7pm
- Charge pager-#5283-please text
- After hours contact STAT RN-#7364

- For all flush / dwell solutions and concentrates, refer to the Pharmacy Catheter Flush Guideline.
- To access guideline, go to:
  - [www-pharmacy.osumc.edu](http://www-pharmacy.osumc.edu)
  - Type “dwell” in search box.

## The Ohio State University Wexner Medical Center

410 West Tenth Avenue, Columbus, OH 43210  
© 2016 The Ohio State University Wexner Medical Center

## *Pocket Guide to*

# Venous Access Device Selection



## Catheter Categories and Specifications

Catheter Type	Uses	Duration	Advantages	Other Considerations
<b>Peripheral Venous Catheter or Midline</b> To order <b>Peripheral:</b> Type <i>Peripheral</i> . To order <b>Midline:</b> Type <i>PICC</i> → Click <i>Midline (button)</i> .	<ul style="list-style-type: none"> <li>All routine IV therapy.</li> </ul>	<ul style="list-style-type: none"> <li><b>Peripheral:</b> At least 96 hrs.</li> <li><b>Midline:</b> 30-day dwell.</li> </ul>	<ul style="list-style-type: none"> <li><b>Peripheral:</b> Bedside insertion and removal by RN.</li> <li><b>Midline:</b> Bedside insertion by PICC Nurse.</li> </ul>	<ul style="list-style-type: none"> <li>Osmolarity &lt; 900mOsm/L.</li> <li>Non-caustic.</li> <li>Non-hyperosmolar.</li> </ul>
<b>PICC</b> To order: Select <i>Manage Orders</i> → <i>Order Sets</i> → Type in <i>PICC</i> . <ul style="list-style-type: none"> <li>If IR to place, then type <i>IR Case</i>, then, under the procedure search, enter <i>PICC</i>.</li> <li>Remember to enter the number of lumens in the comments section. Place order set as well.</li> </ul>	<ul style="list-style-type: none"> <li>Routine IV therapy and hypertonic / caustic solutions.</li> </ul>	<ul style="list-style-type: none"> <li>Up to 12 months.</li> </ul>	<ul style="list-style-type: none"> <li>Bedside insertion.</li> <li>Safe/few complications.</li> </ul>	<ul style="list-style-type: none"> <li>Vascular access team to place. Interventional radiology to place if recommended by vascular access team.</li> <li>Asymptomatic venous thrombosis is common.</li> <li>Avoid in patients with renal disease.</li> <li>Not ideal for same side as implanted device.</li> <li>Phenytoin should not be infused.</li> <li>Removal by RN.</li> </ul>
<b>Pulmonary Artery (PA) Catheter</b> To order: Type <i>PA catheter</i> .	<ul style="list-style-type: none"> <li>Accessory ports used as CVC.</li> </ul>	<ul style="list-style-type: none"> <li>Remove catheter as soon as no longer needed.</li> </ul>	<ul style="list-style-type: none"> <li>Bedside insertion.</li> <li>Hemodynamic monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>Requires physician to place and to remove.</li> </ul>
<b>Non-Tunneled Antiseptic Coated CVC</b> To order bedside insertion: Type <i>CVC</i> → Select <i>Setup for CVC Placement</i> .	<ul style="list-style-type: none"> <li>Routine IV therapy and caustic solutions.</li> </ul>	<ul style="list-style-type: none"> <li>Remove catheter as soon as no longer needed.</li> </ul>	<ul style="list-style-type: none"> <li>Bedside insertion.</li> <li>Lower colonization rate than CVC without coating.</li> <li>Longer duration.</li> </ul>	<ul style="list-style-type: none"> <li>Not for outpatient use.</li> <li>Requires physician to place or NP/PA with special privileges.</li> <li>Removal by RN.</li> </ul>
<b>Tunneled Central Venous Catheter or Powerline</b> To order: Type <i>IR case</i> , then, under the procedure search, choose <i>Insertion CVC Tunneled</i> .	<ul style="list-style-type: none"> <li>Routine IV therapy and hypertonic/ caustic solutions.</li> <li>Better for high frequency access and continuous use.</li> </ul>	<ul style="list-style-type: none"> <li>Indefinite.</li> </ul>	<ul style="list-style-type: none"> <li>Subcutaneous cuff seals skin after 7-10 days.</li> <li>Power injectable if Powerline Line of choice for renal patients needing long term antibiotics.</li> </ul>	<ul style="list-style-type: none"> <li>Requires physician to place.</li> <li>Body image concerns for patient.</li> <li>Removal by interventional radiologist, surgeon, interventional nephrologist.</li> </ul>
<b>Subcutaneous Access Port</b> To order: Type <i>IR case</i> , then, under the procedure search, choose <i>Insertion CVC-tunneled w/port pump</i> .	<ul style="list-style-type: none"> <li>Routine IV therapy and hypertonic / caustic solutions.</li> <li>Better for low frequency, intermittent access.</li> </ul>	<ul style="list-style-type: none"> <li>Indefinite.</li> </ul>	<ul style="list-style-type: none"> <li>No dressings.</li> <li>Unrestricted activity when not accessed.</li> </ul>	<ul style="list-style-type: none"> <li>Requires access with special needle (Huber) through skin.</li> <li>Lowest rates of bacteremia; consider for solid tumor chemotherapy.</li> <li>Removal by IR or surgery.</li> <li>Requires maintenance catheter flush (see Pharmacy Flush/Dwell Policy).</li> <li>If site closed with Dermabond®, inserting clinician must include post-care dressing instructions.</li> </ul>
<b>Non-Tunneled Catheters Used for Hemodialysis/Apheresis</b> To order bedside insertion: Type <i>CVC</i> → Select <i>Setup for CVC Placement</i> .	<ul style="list-style-type: none"> <li>Hemodialysis or apheresis.</li> <li>Not for routine IV therapy.</li> <li>Avoid when feasible.</li> </ul>	<ul style="list-style-type: none"> <li>Up to 2 weeks.</li> </ul>	<ul style="list-style-type: none"> <li>Bedside insertion and removal.</li> </ul>	<ul style="list-style-type: none"> <li>Requires physician to place.</li> <li>Low jugular vein preferred.</li> <li>Removal by physician, hemodialysis nurse, at discretion of nephrology.</li> </ul>
<b>Tunneled Catheters Used for Hemodialysis/Apheresis</b> To order: Type <i>IR case</i> , then, under the procedure search, choose <i>Insertion CVC Tunneled</i> . <b>Note:</b> Comments should include intended use (i.e., dialysis, apheresis).	<ul style="list-style-type: none"> <li>Hemodialysis, apheresis, BMT.</li> <li>Not for routine IV therapy.</li> </ul>	<ul style="list-style-type: none"> <li>Indefinite.</li> </ul>	<ul style="list-style-type: none"> <li>Can be used immediately after placement.</li> <li>Large lumen for apheresis.</li> </ul>	<ul style="list-style-type: none"> <li>Low jugular vein preferred.</li> <li>Placement and removal by interventional radiologist, surgeon, nephrologist, or provider with special privileges.</li> </ul>
<b>Ultrafiltration Catheters</b> <ul style="list-style-type: none"> <li>To order: Select <i>Manage Orders</i> → Select <i>order set</i> → type in <i>Ultrafiltration</i>.</li> <li>Include order set as well.</li> </ul>	<ul style="list-style-type: none"> <li>Ultrafiltration only</li> </ul>	<ul style="list-style-type: none"> <li>One week or less.</li> </ul>	<ul style="list-style-type: none"> <li><b>Peripheral:</b> Bedside insertion by vascular access team (PICC team).</li> <li><b>Central:</b> Insertion by provider with special privileges.</li> </ul>	