

# Bard Access Systems Sample Policy and Procedure

## Site~Rite Ultrasound System

### Site~Rite® Ultrasound System Tips and Use

Please consult product labels and inserts for any indications, contraindications, hazards, warnings and instructions for use.

#### Features of the System:

- **Front panel controls**
  - ON Switch--verify that a probe is properly connected to scanner. A probe must be connected to the scanner for the system to power on. Wait approximately 10 seconds for the display screen to illuminate.
  - OFF Switch—to power off, press the power button or switch again. The system is powered off when the display screen darkens and the green light inside the button turns off.
  - Depth switch 4cm, and 2cm
  - Gain control (brightness)
  - Dot marker switch (dot markers are .5cm apart, to work with the needle guides)—indicates vein depth
  - Green light—when flashing indicates battery running low, approximately 10 minutes left
  - Site~Rite® 3 Ultrasound System also has freeze frame, video output (can be connected to a printer or external video equipment), and reverse image
- **Batteries**
  - Refer to manufacturer's instructions
  - Site~Rite® II Ultrasound System comes with a rechargeable nickel cadmium battery that provides two hours of continuous operation per charge
  - Site~Rite® 3 Ultrasound System comes with a rechargeable nickel metal hydride battery that provides two hours of continuous operation with a five hour recharge
  - Site~Rite® 3 Ultrasound System can be run on AC and/or battery
- **Probes**
  - 9.0 MHz (blue cable) probe is used for vessels that lie between 0-1.5cm below the surface
  - 7.5 MHz (red cable) probe is used for vessels that lie between 1.5-4cm below the surface
  - Probes are precision instruments and must be handled carefully. Do not hold the probe by the translucent probe cap. Never subject the probe to heavy vibration or dropping. Excessive bending or twisting of the probe cord may cause the probe to work intermittently, not at all or misalign.
  - For cleaning and disinfecting the scanner and probes please refer to ultrasound system operator's manual
  - When changing probes, pull the probe straight out from the machine, don't twist
  - The probe must be plugged in for the scanner to power on
  - How and when to check for alignment—please refer to ultrasound system operator's manual
- **Needle guides**
  - Guides are angled for specific intersection points
  - 18g, 20g, and 21g needle guide kits for depths of .5cm to 3.5cm
  - Select the appropriate guide based upon the depth of the vessel
  - Use dot markers to determine correct vessel depth
  - The dot markers also show the path the needle will follow
  - Position the probe transverse to the vessel
  - Instructions for attaching the needle guide (see illustration)
  - Choose the appropriate needle guide based on the depth of the vessel and the gauge of the needle to be used (needle guides can only be used over a sterile probe sheath (1 mil thick) in order to maintain sterility of the Site~Rite®Ultrasound System probe)
  - Clip the short end of the needle guide to the end of the needle guide hook closest to the top of the probe
  - Push the larger end of the needle guide toward the probe until the needle guide snaps on to the needle guide hook. Do not slide. Caution: Always snap the guides onto the hook. Do not slide the needle guide onto the needle guide hook as you may tear the sterile sheath.

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- To use the needle guide, slide the appropriately sized needle, beveled edge facing the probe into the channel on the guide
- **Roll stand**
  - To adjust the height of the scanner, turn the locking knob counter clockwise, slide the post up or down and then lock the mechanism by turning the locking knob clockwise.
  - To adjust the title, turn the adjustment knob located underneath the scanner, until the desired tilt is achieved.

***Note:** It is crucial to practice on the phantom vein several times before attempting to scan a patient. Make sure you are comfortable scanning patients before using the Site~Rite® Ultrasound System to assess a patient's vasculature.*

### **Utilizing the 3D phantom probe model:**

- Center vessel on dot markers
- Watch anterior wall start to collapse as needle begins to penetrate it
- Watch anterior wall spring back once needle enters vessel
- Aspirate for blood return
- Secure the needle and peel the probe away
- Needle bevel must always face down in the needle guide to insure proper orientation inside the vessel

### **Scanning Technique:**

- Position the patient's arm. To access above the antecubital fossa, the patient's arm should be at a 90 degree angle from the body with the palm facing up.
- Apply gentle pressure with the probe because the vein will collapse under greater pressure
- Hold the probe so that the footprint of the probe has complete contact with the skin and is perpendicular to the vessel. If the probe is not perpendicular to the vessel the front and back wall of the vein will not be seen clearly (distorts the image and shape of the vessel)
- Differentiate between an artery and a vein. Fluid filled vessels appear black while surrounding tissues appear gray and white. Arteries pulse and veins collapse with gentle pressure. If the vein does not collapse it is not patent. This is a quick and easy way to assess the patient's vessels before sticking.
- The brachial artery is deeper than the basilic vein as you go up the arm, therefore there is less chance of hitting the brachial artery when accessing the basilic vein above the antecubital fossa.
- Probe differences: **The 9.0 MHz probe is best to use when the vessel is between the skin line and 1.5cm.** You will be able to see vessels between 1.5cm and 4cm, but won't see the vessel walls clearly. The 7.5 MHz probe is best to use when the vessel is between 1.5cm and 4cm.
- Start all scanning with the 4cm setting, then if the vessel is superficial, increase the magnification to 2cm. This setting will magnify the vessel to two times its normal size.

### **Establish a protocol:**

- The Site~Rite® Ultrasound System may be used to pre-assess a patient's vessels
- Keep the Site~Rite® Ultrasound System in a convenient place
- Based on manufacturer's guidelines regarding cleaning and disinfecting the machine and probes
- Based on manufacturer's guidelines regarding periodic probe testing
- Based on manufacturer's guidelines regarding battery charging

*Review cephalic, basilic and median cubital anatomy with the Site~Rite® Ultrasound System. Students should practice using the machine by scanning themselves and as many patients as possible.*

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### Vascular Access with Site~Rite® Ultrasound System<sup>16</sup>

Please consult product labels and inserts for any indications, contraindications, hazards, warnings and instructions for use.

#### Step 1: Patient assessment and education

PICC	Midline Catheters
<ul style="list-style-type: none"> <li>• Verify patient's identity</li> </ul>	<ul style="list-style-type: none"> <li>• Verify patient's identity</li> </ul>
<ul style="list-style-type: none"> <li>• Obtain and review physician's order</li> </ul>	<ul style="list-style-type: none"> <li>• Obtain and review physician's order</li> </ul>
<ul style="list-style-type: none"> <li>• Provide patient with educational material/information regarding the procedure               <ul style="list-style-type: none"> <li>★ Provide clear information about the procedure</li> <li>★ Benefits of the procedure</li> <li>★ Necessity for the procedure</li> <li>★ Risks of the procedure</li> <li>★ Any alternatives</li> <li>★ Risks associated with refusing the procedure</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Provide patient with educational material/information regarding the procedure               <ul style="list-style-type: none"> <li>★ Provide clear information about the procedure</li> <li>★ Benefits of the procedure</li> <li>★ Necessity for the procedure</li> <li>★ Risks of the procedure</li> <li>★ Any alternatives</li> <li>★ Risks associated with refusing the procedure</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Obtain patient's consent</li> </ul>	<ul style="list-style-type: none"> <li>• Obtain patient's consent</li> </ul>
<ul style="list-style-type: none"> <li>• Assess patient               <ul style="list-style-type: none"> <li>★ Check for patient allergies</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Assess patient               <ul style="list-style-type: none"> <li>★ Check for patient allergies</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>Examine both arms with Site~Rite® Ultrasound System, and select the best vein for cannulation<sup>i</sup></b> <ul style="list-style-type: none"> <li>★ Hold the probe perpendicular to the vessel so that the front and back wall of the vessel will be seen clearly</li> <li>★ Avoid veins that are sclerotic</li> <li>★ Select patient's non-dominant arm, if possible</li> <li>★ Avoid extremities that may have compromised circulation, such as the presence of lymphedema or venous congestion secondary to superior vena cava syndrome</li> <li>★ Access vessels above the antecubital fossa, to help eliminate antecubital tension and complications.</li> <li>★ Place the Site~Rite® Ultrasound System probe in the side arm probe holder on the roll stand.</li> <li>★ Apply a layer of non-sterile ultrasonic coupling gel on the acoustic window of the probe head</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Examine both arms with Site~Rite® Ultrasound System, and select the best vein for cannulation<sup>ii</sup></b> <ul style="list-style-type: none"> <li>★ Hold the probe perpendicular to the vessel so that the front and back wall of the vessel will be seen clearly</li> <li>★ Avoid veins that are sclerotic</li> <li>★ Select patient's non-dominant arm, if possible</li> <li>★ Avoid extremities that may have compromised circulation, such as the presence of lymphedema or venous congestion secondary to superior vena cava syndrome</li> <li>★ Place the Site~Rite® Ultrasound System probe in the side arm probe holder on the roll stand.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Place patient in comfortable position</li> </ul>	<ul style="list-style-type: none"> <li>• Place patient in comfortable position</li> </ul>

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### Step 2: Prior to beginning the procedure/anatomical measurement

PICC	Midline Catheters
<ul style="list-style-type: none"> <li>• Wash hands</li> </ul>	<ul style="list-style-type: none"> <li>• Wash hands</li> </ul>
<ul style="list-style-type: none"> <li>• Assemble equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Assemble equipment</li> </ul>
<ul style="list-style-type: none"> <li>• Apply a tourniquet above the anticipated insertion site</li> </ul>	<ul style="list-style-type: none"> <li>• Apply a tourniquet above the anticipated insertion site</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Select a vein based on ultrasound assessment.</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Select a vein based on ultrasound assessment.</b></li> </ul>
<ul style="list-style-type: none"> <li>• Release tourniquet</li> </ul>	<ul style="list-style-type: none"> <li>• Release tourniquet</li> </ul>
<ul style="list-style-type: none"> <li>• Position the arm at a 90 degree angle</li> </ul>	<ul style="list-style-type: none"> <li>• Position the arm at a 90 degree angle</li> </ul>
<ul style="list-style-type: none"> <li>• For SVC placement, measure from the planned insertion site over to the right sternal notch, then down to the third intercostal space (use this method for both right and left sided placements)</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>★ The external measurement can never exactly duplicate the internal venous anatomy.</li> <li>★ <i>Optional:</i> Measure the circumference of the upper arm to establish a baseline.</li> <li>★ Add 2.5cm onto this measurement to account for the length of the catheter outside of the insertion site.</li> </ul>	<ul style="list-style-type: none"> <li>• For midline placement, measure to desired tip location in proximal portion of extremity, just distal to the shoulder and deltoid muscle.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>★ The external measurement can never exactly duplicate the internal venous anatomy.</li> <li>★ <i>Optional:</i> Measure the circumference of the upper arm to establish a baseline.</li> <li>★ Add 2.5cm onto this measurement to account for the length of the catheter outside of the insertion site.</li> </ul>

**Insertion Tips:** Catheter insertion is facilitated when there is adequate vasodilation of the vessel intended for cannulation. To enhance vasodilation:

- ★ Provide a warm, comfortable setting
- ★ Encourage the ingestion of a warm beverage prior to cannulation
- ★ Elevate the head of the bed 15 to 30 degrees
- ★ Place the cannulation site below the level of the heart
- ★ Apply warm compresses to the intended cannulation site and surrounding areas 30 to 40 minutes before insertion of the line

If a topical anesthetic such as EMLA® cream is to be used, allow enough time for it to exert its effect (approximately 1 hour). *Remember: The use of lidocaine or EMLA for precannulation local anesthesia causes relaxation of the tunica media, thus making cannulation more difficult.*

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### Step 3: Set up of sterile field and supplies

PICC	Midline Catheters
<ul style="list-style-type: none"> <li>Position the patient with the arm to be accessed extended at 90 degrees from the trunk of the body.</li> </ul> <p><b>Note:</b> Place patient in comfortable position.</p>	<ul style="list-style-type: none"> <li>Position the patient with the arm to be accessed extended at 90 degrees from the trunk of the body.</li> </ul> <p><b>Note:</b> Place patient in comfortable position.</p>
<ul style="list-style-type: none"> <li>Wash hands with an antimicrobial agent</li> </ul>	<ul style="list-style-type: none"> <li>Wash hands with an antimicrobial agent</li> </ul>
<ul style="list-style-type: none"> <li>Set up a convenient work area and open the kit following sterile procedure.</li> </ul>	<ul style="list-style-type: none"> <li>Set up a convenient work area and open the kit following sterile procedure.</li> </ul>
<ul style="list-style-type: none"> <li>Remove the absorbent underdrape from the kit and place it under the patient's arm and shoulder area.</li> </ul>	<ul style="list-style-type: none"> <li>Remove the absorbent underdrape from the kit and place it under the patient's arm and shoulder area.</li> </ul>
<ul style="list-style-type: none"> <li>Place the tourniquet under the area high on the upper arm close to the axilla or between the axilla and the acromion process of the humerus. Determine the appropriate vessel and cannulation site.</li> </ul>	<ul style="list-style-type: none"> <li>Place the tourniquet under the area high on the upper arm close to the axilla or between the axilla and the acromion process of the humerus. Determine the appropriate vessel and cannulation site.</li> </ul>
<ul style="list-style-type: none"> <li>Open any additional supplies and drop them onto the sterile field. (<b>Site Rite probe cover and/or needle guides</b>)</li> </ul>	<ul style="list-style-type: none"> <li>Open any additional supplies and drop them onto the sterile field. (<b>Site Rite probe cover and/or needle guides</b>)</li> </ul>
<ul style="list-style-type: none"> <li>Place a mask on the patient, if indicated by policy.</li> </ul>	<ul style="list-style-type: none"> <li>Place a mask on the patient, if indicated by policy.</li> </ul>
<ul style="list-style-type: none"> <li>Minimize the risk of occupational exposure to bloodborne pathogens and utilize maximum sterile barrier precautions by donning hair cover, goggles/face shield, mask and sterile gown.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize the risk of occupational exposure to bloodborne pathogens and utilize maximum sterile barrier precautions by donning hair cover, goggles/face shield, mask and sterile gown.</li> </ul>
<ul style="list-style-type: none"> <li>Don the first pair of sterile gloves</li> </ul> <p><b>Note:</b> powderfree gloves are recommended.</p>	<ul style="list-style-type: none"> <li>Don the first pair of sterile gloves</li> </ul> <p><b>Note:</b> powderfree gloves are recommended.</p>
<ul style="list-style-type: none"> <li>Set up all supplies on the sterile field</li> </ul>	<ul style="list-style-type: none"> <li>Set up all supplies on the sterile field</li> </ul>
<ul style="list-style-type: none"> <li>Open glass vials (multidose vials), using a gauze to cover the area to be broken open. Use filter needles, as appropriate, to draw up the NS and lidocaine (if it is to be used). Prepare at least three 10ml syringes filled with NS. Attach a tuberculin needle to the syringe containing the local anesthetic.</li> </ul>	<ul style="list-style-type: none"> <li>Open glass vials (multidose vials), using a gauze to cover the area to be broken open. Use filter needles, as appropriate, to draw up the NS and lidocaine (if it is to be used). Prepare at least three 10ml syringes filled with NS. Attach a tuberculin needle to the syringe containing the local anesthetic.</li> </ul>
<ul style="list-style-type: none"> <li>Remove the catheter from the tray and examine it along the entire length. Be sure the internal stylet is straight (any bends or kinks make stylet removal difficult once the catheter is inserted into the vein).</li> </ul>	<ul style="list-style-type: none"> <li>Remove the catheter from the tray and examine it along the entire length. Be sure the internal stylet is straight (any bends or kinks make stylet removal difficult once the catheter is inserted into the vein).</li> </ul>

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PICC	Midline Catheters
<ul style="list-style-type: none"> <li>• Prepare the catheter by priming it with normal saline and checking it for patency. Position the sterile measuring tape alongside the catheter.</li> <li>★ Single/Dual Lumen Groshong® Catheters:</li> <li>★ Measure the distance (written down during pre-measurement) from the tip of the catheter and note the marking point where it will exit the body.</li> <li>★ Never cut the tip of a Groshong catheter.</li> <li>★ The marking will be the point to where the catheter will be advanced.</li> <li>★ A Groshong single lumen catheter is cut when insertion is completed, prior to attaching the connector.</li> </ul> <p>Per-Q-Cath® Plus and Poly Per-Q-Cath® Catheter Trimming Instructions:</p> <ul style="list-style-type: none"> <li>★ Measure the distance from the exit site end of the catheter to where the tip will lie in the vessel. Note this marking, then allow for the distance of the catheter segment that will extend out of the arm.</li> <li>★ Retract the internal stylet, proximal to the place where the catheter will be cut at the tip.</li> <li>★ Cut the tip with sterile scissors, straight across, not at an angle, so the tip will be positioned freely within the lumen of the vessel and not lay flush against the side of the vein.</li> <li>★ Once the catheter tip is cut, advance the guidewire to within 1/8 to ¼ inch of the tip, covering it completely with the catheter.</li> <li>★ Bend the guidewire at a 90-degree angle at the external tip of the catheter hub so it cannot advance beyond the catheter tip.</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare the catheter by priming it with normal saline and checking it for patency. Position the sterile measuring tape alongside the catheter.</li> </ul>
<ul style="list-style-type: none"> <li>• Prime the catheter connector.</li> </ul>	<ul style="list-style-type: none"> <li>• Prime the catheter connector.</li> </ul>

Note: Set up all supplies and equipment in relatively the same manner every time a PICC or Midline insertion is performed. This will facilitate the procedure, enhance ability and skill, instill practitioner confidence, and cause minimal anxiety for the patient.

### Step 4: Insertion site preparation and skin antisepsis

PICC	Midline Catheters
<ul style="list-style-type: none"> <li>• Prep the insertion site using three 70% alcohol and three povidone-iodine swabsticks.</li> </ul>	<ul style="list-style-type: none"> <li>• Prep the insertion site using three 70% alcohol and three povidone-iodine swabsticks.</li> </ul>
<ul style="list-style-type: none"> <li>• Prep the area (diameter of the arm), scrubbing from the intended cannula insertion site outward in a concentric circle. Do not back track over an already cleansed area.</li> </ul>	<ul style="list-style-type: none"> <li>• Prep the area (diameter of the arm), scrubbing from the intended cannula insertion site outward in a concentric circle. Do not back track over an already cleansed area.</li> </ul>
<ul style="list-style-type: none"> <li>• Use the alcohol swabs first. The alcohol scrub should last for two minutes and must be completely dry before the povidone-iodine is applied.</li> </ul>	<ul style="list-style-type: none"> <li>• Use the alcohol swabs first. The alcohol scrub should last for two minutes and must be completely dry before the povidone-iodine is applied.</li> </ul>

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PICC	Midline Catheters
<ul style="list-style-type: none"> <li>• Apply the povidone-iodine, scrubbing for two minutes. Allow it to dry completely.</li> </ul>	<ul style="list-style-type: none"> <li>• Apply the povidone-iodine, scrubbing for two minutes. Allow it to dry completely.</li> </ul>
<ul style="list-style-type: none"> <li>• Remove the prep gloves.</li> </ul>	<ul style="list-style-type: none"> <li>• Remove the prep gloves.</li> </ul>
<ul style="list-style-type: none"> <li>• Apply tourniquet</li> </ul>	<ul style="list-style-type: none"> <li>• Apply tourniquet</li> </ul>

### Step 5: Draping the patient and the Site Rite Ultrasound Probe

PICC	Midline Catheters
<ul style="list-style-type: none"> <li>• Don second pair of sterile gloves.</li> </ul>	<ul style="list-style-type: none"> <li>• Don second pair of sterile gloves.</li> </ul>
<ul style="list-style-type: none"> <li>• Drape the patient <ul style="list-style-type: none"> <li>★ Position the sterile drapes around the insertion site.</li> </ul> </li> <li>• Place the probe in the side arm probe holder on the roll stand</li> <li>• Apply a layer of non-sterile ultrasonic coupling gel on the acoustic window of the probe head.</li> <li>• Drape the probe for sterile use<sup>iii</sup></li> </ul> <p>Note: some commercially available probe covers have latex. Natural latex may cause allergic reactions.</p> <ul style="list-style-type: none"> <li>★ Make sure that the sheath is fully rolled up</li> <li>★ Place the sheath over the probe head, being careful not to wipe off the coupling gel.</li> <li>★ Cover the probe and cable with the sheath</li> <li>★ Smooth the sheath over the acoustic window of the probe head to remove any air bubbles or folds in the sheath</li> <li>★ Use the poly-bands to hold the sheath in place</li> <li>★ Apply a layer of sterile coupling gel to the sheathed acoustic window. Sterile gel is included in the kit</li> </ul> <p>Note: When using Site~Rite® 3 Ultrasound System needle guides on the ultrasound probes, use only sterile plastic sheaths that are 1 mil (0.001 inch or 0.0254mm) thick.</p> <ul style="list-style-type: none"> <li>• Attach the needle guide to the probe<sup>iv</sup> (unless cannulating the vein in a free hand method) <ul style="list-style-type: none"> <li>★ Choose the appropriate needle guide based on the depth of the structure to be punctured and the gauge of the needle to be used.</li> <li>★ Clip the short end of the needle guide to the end of the needle guide hook closest to the top of the probe.</li> <li>★ Push the larger end of the needle guide toward the probe until the needle guide snaps on to the needle guide hook. Do not slide.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Drape the patient <ul style="list-style-type: none"> <li>★ Position the sterile drapes around the insertion site.</li> </ul> </li> <li>• Place the probe in the side arm probe holder on the roll stand</li> <li>• Apply a layer of non-sterile ultrasonic coupling gel on the acoustic window of the probe head.</li> <li>• Drape the probe for sterile use</li> </ul> <p>Note: some commercially available probe covers have latex. Natural latex may cause allergic reactions.</p> <ul style="list-style-type: none"> <li>★ Make sure that the sheath is fully rolled up</li> <li>★ Place the sheath over the probe head, being careful not to wipe off the coupling gel.</li> <li>★ Cover the probe and cable with the sheath</li> <li>★ Smooth the sheath over the acoustic window of the probe head to remove any air bubbles or folds in the sheath</li> <li>★ Use the poly-bands to hold the sheath in place</li> <li>★ Apply a layer of sterile coupling gel to the sheathed acoustic window. Sterile gel is included in the kit</li> </ul> <ul style="list-style-type: none"> <li>• Note: When using Site~Rite® 3 Ultrasound System needle guides on the ultrasound probes, use only sterile plastic sheaths that are 1 mil (0.001 inch or 0.0254mm) thick.</li> <li>• Attach the needle guide to the probe (unless cannulating the vein in a free hand method) <ul style="list-style-type: none"> <li>★ Choose the appropriate needle guide based on the depth of the structure to be punctured and the gauge of the needle to be used.</li> <li>★ Clip the short end of the needle guide to the end of the needle guide hook closest to the top of the probe.</li> <li>★ Push the larger end of the needle guide toward the probe until the needle guide snaps on to the needle guide hook. Do not slide.</li> </ul> </li> </ul>

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### Step 6: Anesthesia of the Cannulation Site (Optional but highly recommended when using Micro-Introducer)

PICC	Midline Catheters
<ul style="list-style-type: none"> <li>• Palpate and locate the distended vessel.</li> <li>• Anesthetize the venipuncture site.               <ul style="list-style-type: none"> <li>★ Check for patient allergy</li> <li>★ Insert the needle at a 15-to 25-degree angle, inject the lidocaine intradermally into the side of the vein next to the desired insertion site. Do not nick vein.</li> <li>★ Withdraw the needle—allow 5 to 10 seconds for anesthetic to take effect.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Palpate and locate the distended vessel.</li> <li>• Anesthetize the venipuncture site.               <ul style="list-style-type: none"> <li>★ Check for patient allergy</li> <li>★ Insert the needle at a 15-to 25-degree angle, inject the lidocaine intradermally into the side of the vein next to the desired insertion site. Do not nick vein.</li> <li>★ Withdraw the needle—allow 5 to 10 seconds for anesthetic to take effect.</li> </ul> </li> </ul>

### Step 7: Cannulation of the vein<sup>v</sup>

PICC	Midline Catheters
<ul style="list-style-type: none"> <li>• Slide the appropriately sized needle, beveled edge facing the probe, into the channel on the guide.</li> <li>• Place the probe against the skin, perpendicular to the target vessel. Hold the probe so that the needle guide points toward the antecubital fossa.</li> <li>• Center the dot marker on the target vessel.</li> <li>• While keeping the dot markers centered on the target vessel, slowly advance the needle while looking at the screen of the Site~Rite®Ultrasound System scanner. When the needle approaches the target vessel, you should see the anterior wall indenting. Once puncture occurs, the vessel returns to normal shape.</li> <li>• Observe for a blood return into the syringe</li> <li>• Hold the needle, then gently rock the probe away from the needle for a smooth separation. The needle guide channel opens, and the needle smoothly disengages from the guide.</li> </ul>	<ul style="list-style-type: none"> <li>• Slide the appropriately sized needle, beveled edge facing the probe, into the channel on the guide.</li> <li>• Place the probe against the skin, perpendicular to the target vessel. Hold the probe so that the needle guide points toward the antecubital fossa.</li> <li>• Center the dot marker on the target vessel.</li> <li>• While keeping the dot markers centered on the target vessel, slowly advance the needle while looking at the screen of the Site~Rite®Ultrasound System scanner. When the needle approaches the target vessel, you should see the anterior wall indenting. Once puncture occurs, the vessel returns to normal shape.</li> <li>• Observe for a blood return into the syringe.</li> <li>• Hold the needle, then gently rock the probe away from the needle for a smooth separation. The needle guide channel opens, and the needle smoothly disengages from the guide.</li> </ul>
<ul style="list-style-type: none"> <li>• Release the tourniquet through the sterile drape without compromising the sterile field.</li> </ul>	<ul style="list-style-type: none"> <li>• Release the tourniquet through the sterile drape without compromising the sterile field.</li> </ul>
<ul style="list-style-type: none"> <li>• Observe the pattern of blood flow from the vessel. It is very important to observe the pattern of blood flow from the vessel to ascertain that a vein, not an artery, has been cannulated. The color of the blood is not always a reliable indicator. The pulsating flow of blood is the true indicator of arterial access, even in patients with low blood pressure.</li> </ul>	<ul style="list-style-type: none"> <li>• Observe the pattern of blood flow from the vessel. It is very important to observe the pattern of blood flow from the vessel to ascertain that a vein, not an artery, has been cannulated. The color of the blood is not always a reliable indicator. The pulsating flow of blood is the true indicator of arterial access, even in patients with low blood pressure.</li> </ul>

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PICC	Midline
<ul style="list-style-type: none"> <li>Insert the flexible end of the guidewire into the introducer. Advance the guidewire 5 to 10 cm into the vein.</li> </ul> <p><b>Caution:</b> If the guidewire must be withdrawn while the needle is inserted, remove both the needle and the guidewire as a unit to prevent the needle from damaging or shearing the guidewire.</p>	<ul style="list-style-type: none"> <li>Insert the flexible end of the guidewire into the introducer. Advance the guidewire 5 to 10 cm into the vein.</li> </ul> <p><b>Caution:</b> If the guidewire must be withdrawn while the needle is inserted, remove both the needle and the guidewire as a unit to prevent the needle from damaging or shearing the guidewire.</p>
<ul style="list-style-type: none"> <li>If necessary, a small skin nick may be made adjacent to the guidewire to facilitate insertion of the sheath and dilator.</li> </ul>	<ul style="list-style-type: none"> <li>If necessary, a small skin nick may be made adjacent to the guidewire to facilitate insertion of the sheath and dilator.</li> </ul>
<ul style="list-style-type: none"> <li>Advance the small sheath and dilator together as a unit over the guidewire using a slight rotational motion.</li> </ul>	<ul style="list-style-type: none"> <li>Advance the small sheath and dilator together as a unit over the guidewire using a slight rotational motion.</li> </ul>
<ul style="list-style-type: none"> <li>Withdraw the dilator and guidewire, leaving the small sheath in place.</li> </ul>	<ul style="list-style-type: none"> <li>Withdraw the dilator and guidewire, leaving the small sheath in place.</li> </ul>
<ul style="list-style-type: none"> <li>Place a finger over the orifice of the sheath to minimize blood loss and risk of air embolism. The risk of air embolism is reduced by performing this part of the procedure with the patient performing the valsalva maneuver.</li> </ul>	<ul style="list-style-type: none"> <li>Place a finger over the orifice of the sheath to minimize blood loss and risk of air embolism. The risk of air embolism is reduced by performing this part of the procedure with the patient performing the valsalva maneuver.</li> </ul>
<ul style="list-style-type: none"> <li>Thread the PICC into the vein through the dilator to the depth determined by previous measurements, advancing the catheter slowly.</li> <li><b>Note:</b> Rapid entry may cause venospasam.</li> </ul>	<ul style="list-style-type: none"> <li>Thread the PICC into the vein through the dilator to the depth determined by previous measurements, advancing the catheter slowly.</li> <li><b>Note:</b> Rapid entry may cause venospasam.</li> </ul>

### Step 8: Threading the PICC or Midline

PICC	Midline
<ul style="list-style-type: none"> <li>Continue to advance the catheter, for central placement, when the tip has advanced to the shoulder, have the patient turn head (chin on shoulder) toward the insertion site to prevent possible cannulation into the jugular vein.</li> </ul>	<ul style="list-style-type: none"> <li>Continue to advance the catheter, for peripheral placement.</li> </ul>
<ul style="list-style-type: none"> <li>Complete catheter advancement to the desired location.</li> </ul>	<ul style="list-style-type: none"> <li>Complete catheter advancement to the desired location.</li> </ul>
<ul style="list-style-type: none"> <li>Stabilize the catheter position by apply pressure to the vein distal to the introducer sheath.</li> </ul>	<ul style="list-style-type: none"> <li>Stabilize the catheter position by apply pressure to the vein distal to the introducer sheath.</li> </ul>
<ul style="list-style-type: none"> <li>Withdraw the introducer sheath from the vein and away from the site. For peel-apart cannulas, split the introducer sheath and peel it away from the catheter. Slide the intact cannula off the end of the PICC.</li> </ul>	<ul style="list-style-type: none"> <li>Withdraw the introducer sheath from the vein and away from the site. For peel-apart cannulas, split the introducer sheath and peel it away from the catheter. Slide the intact cannula off the end of the PICC.</li> </ul>
<ul style="list-style-type: none"> <li>Groshong only: Remove the suture wing from the delivery card. Squeeze the suture wing together so that it splits open. Place the suture wing around the catheter near the venipuncture site. IF the “Y” adapter of the dual lumen catheter is at the insertion site, the suture wing will not be needed.</li> </ul> <p><b>Caution:</b> To minimize the risk of catheter breakage and embolization the suture wing and “Y” adapter must be secured in place.</p>	<ul style="list-style-type: none"> <li>Groshong only: Remove the suture wing from the delivery card. Squeeze the suture wing together so that it splits open. Place the suture wing around the catheter near the venipuncture site. IF the “Y” adapter of the dual lumen catheter is at the insertion site, the suture wing will not be needed.</li> </ul> <p><b>Caution:</b> To minimize the risk of catheter breakage and embolization the suture wing and “Y” adapter must be secured in place.</p>

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PICC	Midline
<ul style="list-style-type: none"> <li>Stabilize the catheter position by applying light pressure to the vein distal to the insertion site.</li> </ul> <p><b>Caution:</b> Never use force to remove the stylet. Resistance can damage the catheter. If resistance or bunching of the catheter is observed, stop stylet withdrawal and allow the catheter to return to normal shape. Withdraw both the catheter and stylet together approximately 2cm and re-attempt stylet removal. Repeat this procedure until the stylet is easily removed.</p>	<ul style="list-style-type: none"> <li>Stabilize the catheter position by applying light pressure to the vein distal to the insertion site.</li> </ul> <p><b>Caution:</b> Never use force to remove the stylet. Resistance can damage the catheter. If resistance or bunching of the catheter is observed, stop stylet withdrawal and allow the catheter to return to normal shape. Withdraw both the catheter and stylet together approximately 2cm and re-attempt stylet removal. Repeat this procedure until the stylet is easily removed.</p>
Single Lumen Groshong® PICC	Single Lumen Groshong® PICC
<ul style="list-style-type: none"> <li>Using sterile scissors, carefully cut the catheter leaving at least 4-7 cm of the catheter for connector attachment. Inspect cut surface to ensure there is no loose material.</li> </ul>	<ul style="list-style-type: none"> <li>Using sterile scissors, carefully cut the catheter leaving at least 4-7 cm of the catheter for connector attachment. Inspect cut surface to ensure there is no loose material.</li> </ul>
<ul style="list-style-type: none"> <li>Retrieve the oversleeve portion of the connector. Advance it over the end of the catheter. If you feel some resistance while advancing the oversleeve, gently twist back and forth or spin to ease, its passage over the catheter.</li> </ul>	<ul style="list-style-type: none"> <li>Retrieve the oversleeve portion of the connector. Advance it over the end of the catheter. If you feel some resistance while advancing the oversleeve, gently twist back and forth or spin to ease, its passage over the catheter.</li> </ul>
<ul style="list-style-type: none"> <li>Gently advance the catheter onto the connector blunt until it butts up against the colored plastic body. The catheter should lie flat on the blunt without any kinks.</li> </ul>	<ul style="list-style-type: none"> <li>Gently advance the catheter onto the connector blunt until it butts up against the colored plastic body. The catheter should lie flat on the blunt without any kinks.</li> </ul>
<ul style="list-style-type: none"> <li>With a straight motion, slide the oversleeve portion of the connector and the winged portion of the connector together, aligning the grooves on the oversleeve portion of the connector with the barbs on the winged portion of the connector. Do not twist.</li> </ul> <p><b>Note:</b> Connector portions must be gripped on plastic areas for proper assembly. Do not grip on distal (blue) portion of oversleeve.</p>	<ul style="list-style-type: none"> <li>With a straight motion, slide the oversleeve portion of the connector and the winged portion of the connector together, aligning the grooves on the oversleeve portion of the connector with the barbs on the winged portion of the connector. Do not twist.</li> </ul> <p><b>Note:</b> Connector portions must be gripped on plastic areas for proper assembly. Do not grip on distal (blue) portion of oversleeve.</p>
<ul style="list-style-type: none"> <li>Advance completely until the connector barbs are fully attached. A tactile, locking sensation will confirm that the two pieces are properly engaged. (there may be a small gap between the oversleeve and the winged portion of the connector)</li> </ul>	<ul style="list-style-type: none"> <li>Advance completely until the connector barbs are fully attached. A tactile, locking sensation will confirm that the two pieces are properly engaged. (there may be a small gap between the oversleeve and the winged portion of the connector)</li> </ul>

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All PICCS	All PICCS
<ul style="list-style-type: none"> <li>Using the 10ml syringe of normal saline, aspirate for adequate blood return (each lumen).</li> </ul>	<ul style="list-style-type: none"> <li>Using the 10ml syringe of normal saline, aspirate for adequate blood return (each lumen).</li> </ul>
<ul style="list-style-type: none"> <li>Flush each lumen of the catheter with 10ml normal saline to ensure patency. Flush vigorously using the push-pause method. To reduce for blood backflow into the catheter tip, always remove needles or needleless caps slowly while injecting the last .5ml of normal saline.</li> </ul> <p><b>Note:</b> When infusing volume is a concern in small and pediatric patients, flush with 3cc normal saline per lumen.</p> <p><b>Note:</b> Groshong single lumen catheter: If the catheter will not aspirate and infuse immediately after insertion and connector assembly, the catheter may be kinked within the connector assembly. If this is the case, trim the catheter just distal to the connector oversleeve (blue) and attach a new connector. If this situation persists, verify radiographically that the catheter is not kinked inside the vessel.</p>	<ul style="list-style-type: none"> <li>Flush each lumen of the catheter with 10ml normal saline to ensure patency. Flush vigorously using the push-pause method. To reduce for blood backflow into the catheter tip, always remove needles or needleless caps slowly while injecting the last .5ml of normal saline.</li> </ul> <p><b>Note:</b> When infusing volume is a concern in small and pediatric patients, flush with 3cc normal saline per lumen.</p> <p><b>Note:</b> Groshong single lumen catheter: If the catheter will not aspirate and infuse immediately after insertion and connector assembly, the catheter may be kinked within the connector assembly. If this is the case, trim the catheter just distal to the connector oversleeve (blue) and attach a new connector. If this situation persists, verify radiographically that the catheter is not kinked inside the vessel.</p>
<ul style="list-style-type: none"> <li>Apply injection cap.</li> </ul>	<ul style="list-style-type: none"> <li>Apply injection cap.</li> </ul>
<ul style="list-style-type: none"> <li>Heparinize (Per-Q-Cath® Plus and Poly Per-Q-Cath® catheters only).</li> </ul>	<ul style="list-style-type: none"> <li>Heparinize (Per-Q-Cath® Plus and Poly Per-Q-Cath® catheters only).</li> </ul>

### Step 9: PICC/Midline Securement and Dressing

Groshong® PICC and Midline Catheters	Per-Q-Cath®/Poly Per-Q-Cath® PICCs & Midline Catheters
<ul style="list-style-type: none"> <li>As previously noted, the suture wing has been placed near the venipuncture. Place two anchor tapes over suture wing or bifurcation. Form “S” curve in the catheter.</li> </ul>	<ul style="list-style-type: none"> <li>Form “S” curve with the PICC or midline</li> </ul>
<ul style="list-style-type: none"> <li>Place a folded two by two gauze over the insertion site. (during first 24 hours after placement)<sup>vi</sup></li> </ul>	<ul style="list-style-type: none"> <li>Place a folded two by two gauze over the insertion site. (during first 24 hours after placement)</li> </ul>
<ul style="list-style-type: none"> <li>Place a third anchor tape, sticky side up, under catheter just above the suture wing or bifurcation.</li> </ul>	<ul style="list-style-type: none"> <li>Place first anchor tape over wings or bifurcation</li> </ul>
<ul style="list-style-type: none"> <li>Chevron third anchor tape on top of first two anchor tapes.</li> </ul>	<ul style="list-style-type: none"> <li>Cover site and first anchor tape with transparent dressing, up to hub, but not over hub.</li> </ul>
<ul style="list-style-type: none"> <li>Place transparent dressing over suture wing or bifurcation and catheter hub.</li> </ul>	<ul style="list-style-type: none"> <li>Place second anchor tape, sticky side up, under hub and close to transparent dressing. Wedge tape between hub and wings. Anchor only one hub of dual lumen catheter.</li> </ul>
	<ul style="list-style-type: none"> <li>Chevron second anchor tape on top of transparent dressing and place third anchor tape over hub.</li> </ul>
<ul style="list-style-type: none"> <li>Intermittent warm moist packs may be applied to the upper arm to prevent the occurrence of phlebitis.</li> </ul>	<ul style="list-style-type: none"> <li>Intermittent warm moist packs may be applied to the upper arm to prevent the occurrence of phlebitis.</li> </ul>

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### Step 10: X-ray verification for PICC and Midlines

PICC	Midlines
<ul style="list-style-type: none"> <li>• Verify radiographically prior to use. Tip must be located in the superior vena cava.</li> <li>• The following technique has been found extremely effective in visualizing the PICC line when verifying placement:               <ul style="list-style-type: none"> <li>★ <b>Adult:</b> A 14 x 14 shoulder view is used with a Bucky tray and grid. A MR-400 screen is used and the KV is increased by 5-10KV over the normal shoulder technique. Visualization is further enhanced by the use of a 10-15 degree oblique angle rather than the anterior-posterior view.</li> <li>★ <b>Pediatric and Neonate:</b> A rib visualization technique is used with a medium to fast screen (a fast screen will give less patient exposure but also less detail) A Kodak® O.G. PMG high-contrast, or TMG film is used. A KV of 50-60 and a setting of 1.0 to 1.5 with a distance of 36-40 inches (the distance may need to be reduced to 30 inches due to the use of overhead warmers).</li> <li>★ The use of contrast medium may expose the patient to the risk of an adverse reaction to the contrast medium. The use of a water soluble radiographic contrast medium containing iohexol may be indicated. This type of contrast solution has shown a lower incidence of adverse reaction when compared to iodized contrast media</li> <li>★ If it is necessary to use contrast fluid to verify catheter placement, care must be used to prevent subjecting the catheter to extreme pressures. The use of techniques requiring high pressures may weaken the catheter wall and cause the catheter to rupture. Also, note the small fluid volumes required to fill the catheter.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Radiographic position confirmation is recommended when:               <ul style="list-style-type: none"> <li>★ Difficult catheter advancement</li> <li>★ Pain of discomfort after catheter advancement</li> <li>★ Inability to obtain free flowing blood return</li> <li>★ Catheter does not flush easily</li> <li>★ Guidewire is difficult to remove or is bent after removal</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Document in medical record (refer to legal chapter for documentation details)</li> </ul>	<ul style="list-style-type: none"> <li>• Document in medical record (refer to legal chapter for documentation details)</li> </ul>

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### Site~Rite® Ultrasound System Skills Checklist

(bolded items will be practiced during practicum)

	<b>Skill</b>	<b>Met</b>	<b>Not Met</b>
1.	Educate patient on the purpose of the ultrasound.		
2.	Wash hands		
3.	Position the patient's arm. To access above the antecubital fossa, the patient's arm should be at a 90-degree angle from the body with the palm facing up.		
4.	Apply tourniquet if indicated.		
5.	<b>Examine both arms with Site~Rite® Ultrasound System, and select the best vein for cannulation</b>		
6.	<b>Apply a layer of non-sterile ultrasonic coupling gel on the acoustic window of the probe head.</b>		
7.	<b>Hold the probe perpendicular to the vessel so that the front and back wall of the vessel will be seen clearly</b> <b>A. Avoid veins that are sclerotic</b> <b>B. Select patient's non-dominant arm, if possible</b> <b>C. Avoid extremities that may have compromised circulation, such as the presence of lymphedema or venous congestion secondary to superior vena cava syndrome</b> <b>D. Access vessels above the antecubital fossa, to help eliminate antecubital tension and complications.</b>		
8.	<b>Start all scanning with the 4cm setting, then if the vessel is superficial, increase the magnification to 2cm. This setting will magnify the vessel to two times its normal size.</b>		
9.	<b>Differentiate between an artery and a vein. Fluid filled vessels appear black while surrounding tissues appear gray and white. Arteries pulse and veins collapse with gentle pressure. If the vein does not collapse it is not patent. This is a quick and easy way to assess the patient's vessels before sticking.</b>		
10.	<b>Select an access site and note the position of the probe for later reference.</b>		
11.	<b>Note the vessel depth.</b>		
12.	<b>Place the Site~Rite® Ultrasound System probe in the side arm probe holder on the roll stand.</b>		
13.	<b>Prepare the access site according to protocol.</b>		
14.	<b>Apply tourniquet if indicated.</b>		
15.	<b>Apply non-sterile coupling gel to the probe.</b>		
16.	<b>Drape the patient according to protocol.</b>		
17.	<b>Drape the probe for sterile use</b>		
18.	<b>Make sure that the sheath is fully rolled up</b>		
19.	<b>Place the sheath over the probe head, being careful not to wipe off the coupling gel.</b>		
20.	<b>Cover the probe and cable with the sheath</b>		
21.	<b>Smooth the sheath over the acoustic window of the probe head to remove any air bubbles or folds in the sheath</b>		
22.	<b>Use the poly-bands to hold the sheath in place</b>		
23.	<b>Apply a layer of sterile coupling gel to the sheathed acoustic window. Sterile gel is included in the kit</b>		

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	Skill	Met	Not Met
24.	Choose the appropriate needle guide based on the depth of the vessel and the gauge of the needle to be used (needle guides can only be used over a sterile probe sheath in order to maintain sterility of the site rite probe)		
25.	Clip the short end of the needle guide to the end of the needle guide hook closest to the top of the probe		
26.	Push the larger end of the needle guide toward the probe until the needle guide snaps on to the needle guide hook. Do not slide.		
27.	Slide the appropriately sized needle, beveled edge facing the probe, into the channel on the guide.		
28.	Place the probe against the skin, perpendicular to the target vessel. Hold the probe so that the needle guide points toward the antecubital fossa.		
29.	Center the dot marker on the target vessel.		
30.	While keeping the dot markers centered on the target vessel, slowly advance the needle while looking at the screen of the Site~Rite®Ultrasound System scanner. When the needle approaches the target vessel, you should see the anterior wall indenting. Once puncture occurs, the vessel returns to normal shape.		
31.	Observe for a blood return into the syringe		
32.	Hold the needle, then gently rock the probe away from the needle for a smooth separation. The needle guide channel opens, and the needle smoothly disengages from the guide.		

Comments: \_\_\_\_\_

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\_\_\_\_\_

Evaluator Name: \_\_\_\_\_

Evaluator Signature: \_\_\_\_\_ Date: \_\_\_\_\_

<sup>16</sup> Bard Access Systems Revised Basic PICC Education Program

<sup>17</sup> Access Device Guidelines Recommendations for Nursing Practice and Education, Oncology Nursing Society pg 11

<sup>18</sup> Access Device Guidelines Recommendations for Nursing Practice and Education, Oncology Nursing Society pg 11

<sup>19</sup> Bard Access Systems Site~Rite®Ultrasound System IFU pg 14

<sup>20</sup> Bard Access Systems Site~Rite®Ultrasound System IFU pg 20

<sup>21</sup> Bard Access Systems Site~Rite®Ultrasound System IFU pg 21-22