

Specimen Collection/Handling - Venipuncture

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PURPOSE

This procedure provides instructions for blood collection by venipuncture phlebotomy and will include specific instructions for the following:

- Proper patient identification and assessment of physical status
- Proper equipment selection and use
- Proper Order of Draw for multiple blood tube collection
- Preferred venous access sites and precautions
- Patient care following completion of venipuncture
- Proper labeling of blood tubes and completion of lab requisitions

MATERIALS

Supplies and Equipment (*See Notes Section for detailed descriptions*)

- Evacuated Collection Tubes, selected by color-coded stoppers and size (see Notes)
- Safety Needles (Avoid use of bore gauge of 25 or higher)
- Holder/Adapter - use with the evacuated collection system
- Tourniquet
- Alcohol Wipes - 70% isopropyl alcohol.
- Povidone-iodine or Chlorhexidine wipes/swabs – Used for blood culture prep
- Gauze pads
- Adhesive bandages / tape
- Needle disposal unit
- Latex-free Gloves
- Other Personal Protective Equipment as *prescribed by facility*

Equipment for Alternate Methods:

- Sterile winged infusion needle (or “Butterfly”) system
- Sterile Syringe and needle

SPECIAL SAFETY PRECAUTIONS

1. Personal Protective Equipment must be worn as per facility policy. Gloves must be worn to protect both the phlebotomist and the patient. Gloves should be replaced between patients and if soiled or torn. Universal Precautions shall be maintained.
2. Needles equipped with safety re-capping devices should be used, if available. Needles should NEVER be broken, bent, or recapped and should be placed in a proper disposal unit IMMEDIATELY after their use. Do not re-use needles.
3. Be familiar with the Patient Bill of Rights. Try to put the patient at ease by being courteous, understanding and conversational. Respect their right to refuse or halt the procedure at any time.

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4. Assess the patient throughout the procedure for their comfort, safety, and well-being. The procedure is to be **IMMEDIATELY STOPPED** if the patient complains of pain at any time, or shows discomfort such as sweating, pallor, or lightheadedness. If the patient demonstrates dizziness or impending loss of consciousness, either lay him down or lower his head below the level of his heart. Apply a cold compress to the back of his neck or forehead. Continue care until recovery is apparent. Notify the nurse or supervisor of the event.
5. Site selection for venipuncture is important to avoid tissue or nerve damage and to avoid accessing an artery. CLSI standards recommend selecting a large, palpable vein from the antecubital area in this order of choice: median cubital, cephalic, and lastly basilic. (See Figure 1)

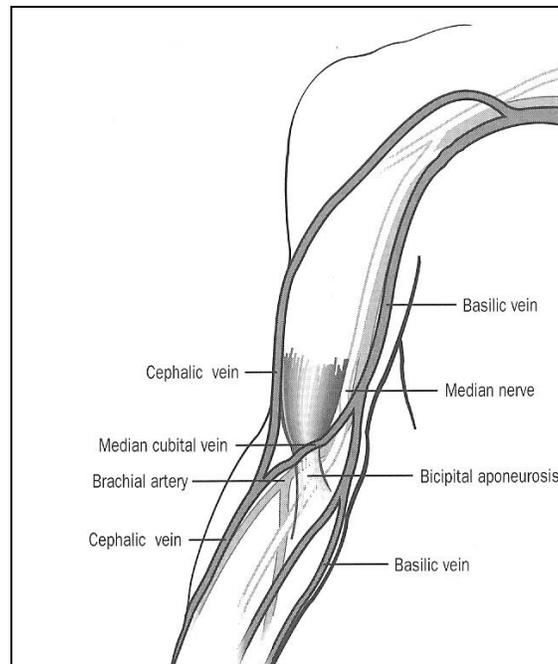


Figure 1 **Common placement of veins in the arm**

6. Examine both arms *before selecting the basilic vein* because of its proximity to arteries and nerves. If none of these appear acceptable, the top surface of the wrist and hand may be examined for suitable veins. Avoid these areas when choosing a site:
 - Extensive scars from burns and surgery
 - The arm on the side of a previous mastectomy or breast cancer surgery—this can cause harm to the patient and test results may be affected by existing lymphedema
 - Hematoma—If another site is not available, collect the specimen below the hematoma

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- Intravenous therapy (IV) / blood transfusions - fluid may dilute the specimen, so collect from the opposite arm. If necessary, samples may be drawn BELOW the IV site by following these procedures:
 1. Turn off the IV for at least 2 minutes before venipuncture.
 2. Apply the tourniquet below the IV site. Select a vein other than the one with the IV, if possible.
 3. Perform the venipuncture. Draw 5 ml of blood and discard before drawing the specimen tubes for testing.
 - Cannula/fistula/heparin lock—only authorized personnel (such as RN's with training) may draw blood from these devices.
 - Edematous extremities—accumulated tissue fluid can alter test results.
 - Legs and feet are NEVER to be used for venipuncture sites.
7. If no blood appears after insertion of the needle, you may be able to make small adjustments in the angle or depth of the needle position. However, do not dig or probe excessively. If no blood appears after small adjustments, release the tourniquet, remove the needle and apply pressure with gauze.
 8. If you are unable to palpate a suitable vein or are unsuccessful after 2 attempts, ask the patient for permission to have another phlebotomist attempt the procedure.
 9. Post procedure care is essential to the care of the patient. Provide pressure to the puncture site for sufficient time to allow the area to stop bleeding and to avoid hematoma formation. Certain medications will retard the patient's clotting mechanism, causing the patient to bleed easily and for longer periods. It may be necessary in some cases to apply pressure for 5 – 10 minutes after venipuncture. Do not allow the patient to leave until you have visually assessed the puncture site (by a "two-point" check of bleeding and hematoma formation before applying bandage) to make sure bleeding has stopped. Apply a clean bandage and/or tape to the site before dismissing the patient.

PROCEDURES

Procedure A: Proper Patient Identification and Assessment of Orders

Procedure B: Specimen Collection by Venipuncture

Procedure C: Specimen Labeling and Post Patient Care

Procedure A: Proper Patient Identification and Assessment of Orders

Step	Action			
1	Obtain a written order for specimen collection from the caregiver.			
	<table border="1"><thead><tr><th>If</th><th>Then</th></tr></thead><tbody><tr><td>The caregiver gives a verbal order</td><td><ul style="list-style-type: none">• Proceed with specimen collection• Obtain the written order as soon as possible for specimen processing.</td></tr></tbody></table>	If	Then	The caregiver gives a verbal order
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The caregiver gives a verbal order	<ul style="list-style-type: none">• Proceed with specimen collection• Obtain the written order as soon as possible for specimen processing.			
2	Greet the patient. Identify yourself and indicate the procedure that will take place.			
3	Ask the patient to state his/her full name AND his/her date of birth. Compare			

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	this information with the written order (can be accessed from chart) and pre-printed tube labels.	
	If	Then
	Patient's stated name AND date of birth match the orders (chart) and pre-printed labels	Proceed with the venipuncture.
	The patient's stated name OR date of birth do not match the orders or labels	<ul style="list-style-type: none"> • Do Not Proceed • Resolve discrepancies before proceeding.
	The patient is unable to provide information for whatever reason	<ul style="list-style-type: none"> • Obtain the information from a family member or caregiver, if present • If not present, do not proceed: notify the person in charge about the problem
4	If the patient's identity has been verified, check the orders for special requirements (fasting, timed collection, not fasting) and verify the patient meets these conditions.	
5	<i>Proceed with sample collection (Procedure B) if all the above conditions have been met.</i>	

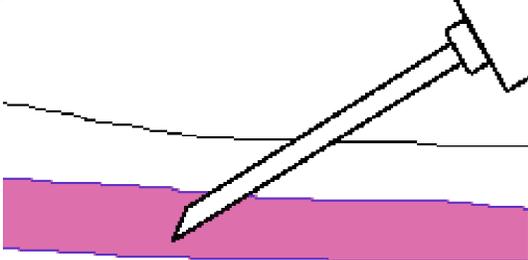
Procedure B: Specimen Collection by Venipuncture

For Alternate Methods of Specimen Collection, see **Notes** Section.

Step	Action	
1	Assemble all supplies and equipment needed to perform the procedure. Put on gloves (and other personal protective equipment as per facility policy).	
2	Select the appropriate blood tubes for the tests ordered and arrange them in the correct Order of Draw. (See Table 1)	
3	Position the patient in a phlebotomy chair with arms or reclining on an examination bed. Extend the patient's arm.	
4	Apply a tourniquet on the arm 3 – 4 inches above the site to be examined. Examine the veins in the area by palpating them with your finger. Do not leave the tourniquet on for longer than 1 minute; if necessary, release it to allow the blood to re-circulate (about 1 – 2 minutes) and re-attach prior to proceeding. The patient may assist by making a fist, but do not allow them to “pump” the fist.	
5	Select a suitable venipuncture site. Memorize the location by noting markers (freckles, creases, skin contour, etc). Release the tourniquet.	
6	Prepare the selected site by using an alcohol prep to cleanse in a circular fashion; begin at the center of the site and work outward. Allow to air dry.	
	If	Then
	A blood culture has been ordered	<ul style="list-style-type: none"> • Follow alcohol cleansing with iodine or

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		<p>chlorhexidine</p> <ul style="list-style-type: none"> • Apply the antiseptic to the center of the site and move outward in a circular motion. Allow to air dry for 30 seconds. • Clean the entry port of the blood culture tube or bottle with this antiseptic as well.
7	Reapply the tourniquet 3 – 4 inches above the prepared site.	
8	Uncap the needle device and inspect the tip of the needle for burrs or defects (Do not use if any defects are visible—replace the needle and repeat this step)	
9	Grasp the patient's arm firmly using your thumb and forefinger to draw the skin taut and anchor the vein.	
10	<p>Grasp the collection device in your other hand and aim the needle so that it forms a 15 to 30 degree angle with the surface of the arm. (Figure 2)</p> <div style="text-align: center;">  <p>The diagram shows a cross-section of a patient's arm with a pink shaded area representing the skin. A needle is shown inserted into the skin and vein. The needle is angled upwards from the horizontal surface of the arm. A horizontal line is drawn across the arm to indicate the surface, and the needle's shaft is shown at an angle to this line, representing the 15 to 30 degree angle mentioned in the text.</p> </div> <p>Figure 2 Diagram of needle angle of approximately 30 degrees</p>	
11	In a smooth motion, insert the needle with the bevel up through the skin and into the lumen of the vein in the same general direction as the vein. Switch hands to hold the needle device steady so you may begin to collect blood.	
12	Evacuated Tube system: Gently insert tubes into the holder, following the correct order of draw (If a blood culture is ordered, blood culture tubes must be first), allow each tube to fill before gently pulling it out of the holder.	
13	While the last tube to be drawn is filling, release the tourniquet.	
14	Position a clean gauze pad over the site and remove the needle from the patient's arm using a swift backward motion.	
15	Press down on the gauze once the needle is out of the arm, and apply adequate pressure to avoid formation of a hematoma. The patient can assist by taking over this task but do not allow bending of the arm.	
16	<p>Mix the contents of all blood collection tubes as soon as possible by completely inverting 5 – 10 times.</p> <p><i>Go to Procedure C for Specimen Labeling and Post Care</i></p>	

Procedure C: Specimen Labeling and Post Patient Care

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Step	Action						
1	Remain at the patient's side while you label each specimen tube with <u>all</u> of these components: <ul style="list-style-type: none"> • Patient's last name, first name (middle initial optional). • Patient's Date of Birth OR • Patient's Account or ID number (as per facility) • Today's date (and time if essential to order requirement) • Phlebotomist's Initials • Ordering Physician (as per facility) 						
2	Conduct a Two-point check of the venipuncture site before applying a bandage: <ul style="list-style-type: none"> • Remove the gauze and observe the site for visible bleeding from the puncture site • Check for hematoma formation by watching the site 5 – 10 seconds after releasing pressure on the gauze 						
	<table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: center;">If</th> <th style="text-align: center;">Then</th> </tr> </thead> <tbody> <tr> <td>Bleeding has stopped and no hematoma has formed</td> <td>Apply fresh gauze and a bandage or tape to the area</td> </tr> <tr> <td>Blood is still oozing from the site or a mound is beginning to form around the puncture site</td> <td>Re-apply firm pressure with the gauze and maintain pressure until bleeding stops before applying a bandage</td> </tr> </tbody> </table>	If	Then	Bleeding has stopped and no hematoma has formed	Apply fresh gauze and a bandage or tape to the area	Blood is still oozing from the site or a mound is beginning to form around the puncture site	Re-apply firm pressure with the gauze and maintain pressure until bleeding stops before applying a bandage
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3	Assess the patient for his/her apparent recovery before allowing them to stand and depart.						
4	Document date, time and collector's initials on the order or requisition. Deliver the blood specimens to the laboratory or specimen processing area as soon as possible.						

End of Procedure

NOTES

Table 1

Blood Collection of Tubes and Order of Draw			
Color of Stopper	Additive	Mode of Action	General Use
1. Yellow-black tube (or bottle)	Broth mixture	Preserves viable microorganisms	Microbiology studies
2. Light blue	Sodium citrate	Removes calcium by forming salts	Coagulation tests
3. Red, gold, or speckled pattern	No additive or with clot activator	Plain or activator allows blood to clot.	Chemistry, Immunology, Serology
4. Green	Lithium or Sodium Heparin	Inactivates thrombin and thromboplastin	Chemistry
5. Purple or	EDTA	Removes calcium by	Hematology,

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lavender		forming salts	Blood Bank
6. Gray	Sodium fluoride and potassium oxalate	Glycolytic inhibitor to preserve glucose levels	Glucose testing

1. Blood Collection Evacuated Tubes are designed to fill with a predetermined volume of blood by vacuum. The rubber stoppers or caps are color coded according to the additive that the tube contains. The tubes must be drawn in a specific order to avoid cross-contamination of additives between tubes. Table 1, above, contains the CLSI-recommended Order of Draw (2003). CLSI has determined that a plain tube (Red top) need not precede the Citrate tube (Light blue top). Once blood is introduced, tubes with additives must be thoroughly mixed by completely inverting 5 to 10 times each to avoid erroneous test results. Blood should **NEVER** be poured from one tube to another.
2. Safety Needles – Needles should be sterile, individually packaged, and preferably with a safety capping device. The gauge number indicates the bore size: the larger the gauge number, the smaller the needle bore. Avoid use of needles of small needle bore (25 gauge or higher) because they may hemolyze the sampled blood. Needles are available for evacuated systems and for use with syringes, single draw or butterfly systems. The needle should be inspected prior to insertion into the vein for bends or burrs in the needle-tip—do not use if these conditions are seen.
3. Holder/Adapter—preferably single-use. Multiple use needle holders should appear clean—discard if soiled.
4. Tourniquet—preferably single-use and latex-free. If multiple use, clean frequently with isopropyl alcohol; discard if visibly soiled.
5. Povidone-iodine or Chlorhexidine wipes/swabs –Used following alcohol for site cleansing when blood cultures are to be drawn. Do not use Iodine prep if patient is allergic to this.
6. Needle disposal unit – should be located within immediate reach of phlebotomist.
7. Gloves—should be latex-free vinyl or rubber.
8. **Alternate Methods of Specimen Collection:** Insert the following steps into the procedure if using a syringe or a winged infusion needle:

Syringe Method:

 - Remove a syringe from its packaging.
 - Move the plunger in and out of the barrel several times, and then push the plunger into the barrel until it is completely depressed.
 - Attach a needle securely to the syringe (if not already attached).
 - After inserting the needle into the vein, hold the syringe steady while slowly pulling back on the plunger with the other hand.
 - Pull back steadily until the plunger is filled with sufficient blood.
 - After the needle has been removed from the puncture site, Transfer the contents of the syringe immediately by inserting the needle into the cap of each evacuated tube (in proper order of draw) and allow each tube to fill.

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Winged Infusion Needle (“Butterfly”) Method:

- Remove the “butterfly” needle from its packaging.
- Remove a syringe from its packaging.
- Move the syringe plunger in and out of the barrel several times, and then push the plunger into the barrel until it is completely depressed.
- If a needle is attached to the syringe, remove it and save the needle for transfer of the blood into the collection tubes.
- Attach the syringe firmly to the end of the tubing of the butterfly needle system.
- Tear off 2 pieces of tape and attach them loosely to a surface within reach.
- Grasp the needle by bending the wings together.
- After inserting the needle, allow the wings to unbend and rest on the patient’s arm.
- Place 1 or 2 pieces of tape across the wings to secure them to the arm.
- Gently pull back on the plunger of the syringe until sufficient blood is collected.
- Remove the tape and bend the wings together.
- After the needle has been removed from the puncture site, disengage the syringe from the butterfly device.
- Firmly attach a needle to the syringe.
- Transfer the contents of the syringe immediately by inserting the needle into the cap of each evacuated tube (in proper order of draw) and allow each tube to fill.

REFERENCES

1. Ernst, Dennis J., To The Point, Articles in Phlebotomy: What Every Phlebotomist Must know, Center for Phlebotomy Education, Inc., www.phlebotomy.com. Updated 2006, accessed 2008.
2. Ernst, Dennis J., To The Point, Articles in Phlebotomy: The Order of Draw, Center for Phlebotomy Education, Inc., www.phlebotomy.com. Updated 2008, accessed 2008.
3. The Clinical and Laboratory Standards Institute. *Procedures for the Collection of Diagnostic Blood Specimens by Venipuncture*. Approved Standard, H3-A6, Wayne, PA, 2007.
4. Phelan, Susan. *Phlebotomy Techniques: A Laboratory Workbook*, American Society of Clinical Pathologists, Chicago, IL, 1993
5. Mercer University School of Medicine. Pathology Tutorial: Routine Venipuncture and Specimen Handling, The Internet Pathology Laboratory for Medical Education, Savannah, GA, <http://library.med.utah.edu/WebPath/webpath.html>. Accessed 2011.
6. Centers for Medicare and Medicaid Services. Department of Health and Human Services. Part 493—*Laboratory Requirements; Clinical Laboratory Improvement Amendments of 1988*. 42 CFR, Sections 493.1242 (a)(2) – (a)(3). U.S Government Printing Office. Published annually.