Phlebotomy

General Guidelines for Venipuncture Specimen Collection

Inpatient Policy

♦ After documented competence, RNs, LPNs, and ASTs may perform this procedure. In EMTC, paramedics (EMT-P) and EMTs also draw blood. This is considered an advanced skill for SNEs. Anesthesiologists may perform this procedure. Personnel who obtain specimens are held accountable for positive patient identification and correct specimen labeling.

♦ All blood bank specimens, including T&C specimens require two signatures on the label by persons validated in the Blood Administration competency with one signature from the person responsible for the patient’s care. Signatures indicate accountability that the specimen was observed being obtained and properly labeled at the patient’s bedside.

♦ Only two attempts should be made to obtain the specimen. If a second person is unable to obtain the specimen after an additional 2 attempts, House Staff should be called to obtain the specimen.

♦ Repeated errors in blood specimen labeling may be considered gross negligence at the discretion of the Director. Repeated errors are defined as follows:
  1. The wrong label, name or hospital number
  2. Drawing blood from the wrong patient
  3. Omitting any of the required label information (See Corrective Action Policy in Administrative Manual)

♦ Errors with T&C specimens include missing label information, such as:
  1. Date, time, location, ID#, or signature
  2. Minor clerical errors such as the misspelling of the patient’s name,
  3. Omission or reversal of letters or numbers regarding the patient’s name or hospital number

♦ Errors involving T&C specimens will result in employees being placed on a Performance Improvement Plan. A repeat of this error may be considered gross negligence at the discretion of the Director. Life threatening errors in specimen labeling which shall be considered gross negligence include:
  1. Wrong patient label
  2. Specimen collection from the wrong patient

Precautions

♦ Do not draw specimens from sites proximal to IV fluid or blood administrations.

♦ Do not draw venous samples from infected areas to avoid introducing pathogens into the vascular system.

♦ Avoid drawing blood from areas that are edematous, sites of previous hematoma or vascular injury, or same side as mastectomies or hemodialysis access, i.e. fistula, graft, shunt.

♦ Hemodialysis access devices may not be drawn from unless an M.D.’s order is obtained.

♦ The median cubital and cephalic veins are the preferable vessels from which to collect blood, however the wrist and the hand are also acceptable. The basilic vein should be used as the last choice because of its proximity to the median nerve and the brachial artery.

♦ Areas of extensive scarring or healed burns should be avoided.

♦ Because of lymphostasis, specimens taken from the side on which a mastectomy was performed may not be truly representative specimens. If the arm on that side does not appear swollen, it may be used if necessary.

♦ Specimens collected from a hematoma area may cause erroneous results. If another vein site is not available, the specimen should be collected distal to the hematoma.

♦ Specimens should NOT be collected from an arm with an IV. If this is impossible, then the specimen should be collected below the IV site.

Equipment

<table>
<thead>
<tr>
<th>Patient Identification Label</th>
<th>Lab Request Form</th>
<th>Marking Pens (Not Gel)</th>
<th>Sharps Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phlebotomy tray:</td>
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<tr>
<td>Collection Tubes (IN DATE)</td>
<td>Needle or Butterfly Syringe</td>
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<td></td>
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<tr>
<td>Alcohol Swabs</td>
<td>Gauze</td>
<td></td>
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<tr>
<td>Tube holder (small tube rack)</td>
<td>Skin Disinfectant</td>
<td></td>
<td></td>
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<tr>
<td>Gloves</td>
<td>(Providone-Iodine Sepps, alcohol prep etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tourniquet</td>
<td>Tape or adhesive bandages</td>
<td></td>
<td></td>
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<tr>
<td>Holder</td>
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Modified March 2010
**Procedure**

Choose blood collection device and needle based on the patient’s age and size of vein available.
- Vacutainer and 21 gauge vacutainer needle device; use on large, firm veins (i.e. antecubital)
- On children or adults with small, fragile veins, use a butterfly needle and 10cc syringes. Sizes available: 25, 23, 21, 19 gauge. Selection is based on vein size.

**Steps**

1. Identify the patient using 2 patient identifiers:
   a. Check the patient’s armband for name and MRN.
   b. Have the patient state their first and last name and date of birth.

2. Assemble the supplies.

3. Explain the procedure.

4. Wash hands or disinfect with an alcohol based hand sanitizer. Put on gloves to comply with Universal [Standard] Precautions.

5. Place the patient in a supine or sitting position with arm supported.

6. Assess the patient’s veins to determine the best puncture site and to determine the proper needle size to best accomplish the venipuncture. Assure a vein has been selected. Observe the skin for the vein’s blue color and palpate the vein for a firm rebound sensation with no pulsation.

7. Apply the tourniquet to the patient’s arm 3 to 4 inches above the venipuncture site. Avoid applying too tight or leaving in place longer than one minute to eliminate hemoconcentration which may cause erroneous test values.

8. Clean the venipuncture site with a 70% alcohol prep or providone-iodine prep using a circular motion, spiraling outward from the site. Allow the site to air dry before performing the venipuncture. Do not palpate the site after cleansing. If touching the site is necessary after cleansing, clean the site again before performing the venipuncture.

9. Immobilize the vein by pressing 1 inch to 2 inches below the venipuncture site, drawing the skin taut.

10. Position the needle bevel up, the shaft of the needle parallel to the path of the vein and at an angle of 30-45 degrees from the surface of the site if using a holder and needle, or at an angle of 5-30 degrees, depending on vein depth, if using a butterfly.

11. Insert the needle into the vein and withdraw blood slowly:
   a. Tube Holder and needle:
      - Grasp the holder securely and push down the collection tube until the needle punctures the rubber stopper.
      - Blood will flow into the tubes automatically
      - The tube should be maintained below the site to prevent backflow or contact with the anticoagulant which could contaminate the next tube drawn and alter results.
      - Release the collection tube from the holder to release the vacuum before withdrawing the needle from the vein.
      - Refer to attachment for tubes to use.
      - Gently invert tube 20 times to prevent micro clotting.
      - Dispose of holder and needle as one unit into a sharps container. These are considered single use devices and should be discarded.
   b. Syringes
      - Gently pull the plunger of the syringe gently to create a steady suction.
• Do not collapse the vein
• Do not withdraw forcibly; this creates excessive pressure, foaming of blood occurs and the specimen will be hemolyzed.

10. Remove the tourniquet, put a gauze pad over the puncture site, gently remove the needle and simultaneously apply pressure. Instruct the patient to keep their arm straight and to continue pressure until bleeding has stopped.

11. Activate the safety device to prevent a needle-stick injury – do not recap the needle—and continue to hold pressure until bleeding stops (usually within 2 minutes).

12. Apply bandage to the puncture site using.

13. If the blood was drawn using a syringe, immediately transfer the sample to a collection tube, using a transfer device, to prevent clotting. Allow the tube’s vacuum to fill the tube. Do not force blood into the tube; this may cause hemolysis and/or over filling of the tubes which can cause erroneous test results. Immediately dispose of the holder and needle/syringe into a sharps container. These are considered single use devices and should be discarded.

14. All blood specimens will be labeled with:
   a. * Patient's name,
   b. *Hospital number/Social Security Number or DOB
   c. Time and date collected,
   d. Patient location
   e. Test(s) to be performed
   f. Full signature and title of the person collecting the specimen.
   g. For Blood Bank/Transfusion Service specimens I.D. of a witness must also be placed on the specimen label

* These are mandatory patient identifiers.

Specimens incorrectly labeled or misidentified can result in negative patient outcomes up to and including death. Blood Bank/T&C specimens require two signatures on the specimen label. Blood Bank/T&C signatures will be from persons deemed competent in Blood Administration, and will include the signature of the person responsible for the patients' care. Confirm all information with the patient’s armband at the time of collection. Label specimen tube in the presence of the patient after the specimen has been collected.

15. Send specimen to the laboratory with a lab request form, unless electronically doing order/entry. Staff should initial the request form.

16. Discard gloves and wash hands

17. Document in the nursing records the time and site of venipuncture; name of tests and sample sent to laboratory. Document any adverse effects such as hematoma.

### Venipuncture Order of Draw, Collection, and Transfer

#### General Information:

- Different types of blood collection systems require a different order of draw.
- Detailed information on specimen types is given with the specific test information.

#### Order of Draw:

**Evacuated System (vacutainer) and Syringe (order of transfer)**

1. Blood Cultures
2. Clear Discard Tube
3. Light blue (Sodium Citrate) *Note: It is required to draw a Clear Discard Tube prior to drawing any light blue tube.
4. Red, Royal Blue with stripe
5. Gold Hemoguard® serum separator gel tubes
6. Green Tubes, Lt. Green (Na Heparin & Li Heparin)  
7. Lavender, Pearl, Tan (EDTA), Royal Blue with lavender stripe  
8. Gray Hemoguard®  
9. Yellow (ACD) tube

**Skin Puncture (Order of Collection):**

1. Lavender (EDTA)  
2. Green (Heparin)  
3. Gray (Sodium Fluoride)  
4. Gold (SST)  
5. Red (Serum)

**General Guidelines for Arterial Puncture Procedure**

**Inpatient Policy**

♦ This procedure is restricted to RNs and RTs who have completed specialized classes in their area on arterial puncture.  
♦ Arterial punctures for blood gases are performed upon a physician’s order or per protocol for obvious acute respiratory distress.  
♦ Wash hands and put on gloves.  
♦ Prior to a radial puncture, perform the Allen’s Test to determine adequacy of collateral circulation.  
♦ Know the patient’s blood pressure reading before doing an arterial puncture.  
   1. Systolic pressure must be at least 110 for the syringe to self-fill.  
   2. Systolic pressure below 110 - syringe must be filled by aspiration.  
♦ If patient is receiving oxygen, the type and percent of oxygen should be included with the order and lab transmittal. Oxygen will affect the results of the test. The temperature of the patient should also be included.  
♦ Do not rush in search for a site. One poorly performed arterial puncture can ruin a choice site by causing a hematoma. An area the size of a dime can accommodate twelve arterial punctures without damage if carefully done.  
♦ If an artery is nicked, the pulse may disappear due to arterial spasms. Wait a few seconds to see if it will reappear. If not, choose another site.  
♦ If unable to obtain blood after two attempts, find another individual to try.

**Equipment - Disposable Blood Gas Kit containing:**

<table>
<thead>
<tr>
<th>Patient Identification Label</th>
<th>Marking Pens (Not Gel)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heparinized syringe with needle</td>
<td>Blood Gas Syringe cap</td>
</tr>
<tr>
<td>Needle stopper cube</td>
<td>Skin Disinfectant</td>
</tr>
<tr>
<td>Gauze</td>
<td>(Providone-Iodine Sepps, alcohol swabs etc.)</td>
</tr>
<tr>
<td>Bandage</td>
<td>Adhesive tape</td>
</tr>
<tr>
<td>Emesis basin or cup containing ice chips</td>
<td>Towel roll or prop</td>
</tr>
<tr>
<td>Clean gloves</td>
<td>Biohazard sharps container</td>
</tr>
<tr>
<td>Patient ID label</td>
<td></td>
</tr>
</tbody>
</table>

**Procedure**

1. Identify the patient using 2 patient identifiers:  
   o Check the patient’s armband for name and MRN.  
   o Have the patient state their first and last name and date of birth.  
2. Assemble all materials and supplies at patient’s bedside.  
3. Explain procedure to patient. Undue anxiety can cause hyperventilation.
4. Select an easily palpable artery, i.e. radial or femoral. Radial artery is easy to palpate and if damaged by puncture the ulnar artery will take over. Arterial puncture should only proceed when you are sure you can feel the pulse, and collateral circulation has been established via the Allen’s Test.

5. Position patient so selected site is easily accessible. This insures fixation of artery, making for an easier needle insertion.
   - **Radial puncture**: Have elbow straight, palm up, and hyperextend hand by resting on prop or towel roll.
   - **Femoral puncture**: Have knee straight and feet 10 - 18 inches apart with toes up.

6. Palpate selected artery with the first two fingers of your dominant hand.

7. Open packet of gauze to have ready after withdrawing needle. Keep sterile.

8. Put on gloves.

9. Loosen cap from needle and have syringe ready for puncture. Keep sterile.

10. Cleanse the skin thoroughly with alcohol prep. May cleanse gloved palpating fingers in the same manner.

11. Bracket puncture site with the first two fingers of your non-dominant hand. To stabilize artery to prevent repeated misses.

12. Apply slight pressure over the artery without contaminating site. Tourniquet is not used as too much pressure can occlude the artery.

13. Hold needle, bevel up, directly over the artery, and insert the needle at a 45-degree angle for radial artery or at a 90 degree angle for a femoral artery, so that it pierces the skin first and then the artery. Pierce the artery quickly and sufficiently deep. If you have overshot the artery, withdraw the needle slowly so that the blood enters the syringe as soon as the needle re-enters the artery. It is simpler to withdraw into the artery as a result of an overshoot, than to re-enter the artery once the needle is withdrawn.

14. Hold the syringe lightly during aspiration. Arterial pressure will usually push the blood into the syringe. Plunger moves freely within the heparin-coated barrel.

15. Collect 2cc of blood. 2cc is the ideal amount, but lab can run the test with only 0.5cc of blood if that is the only amount that can be obtained.

16. Compress artery with dry gauze square as you carefully withdraw the needle. The assistance of a second person will expedite the completion of the procedure.

17. Expel any air from syringe and needle.

18. Remove needle from syringe and immediately replace with blood gas cap. Make certain air does not enter syringe. **Syringe must be air free.**

19. Continue to apply pressure to puncture site as you gently rotate syringe with the other hand to mix the heparin coating of the syringe with the blood to prevent coagulation. **Apply pressure to puncture site for five (5) minutes, radial puncture or 10 minutes, femoral puncture, unless patient is on heparin, in which case pressure is to be applied for a minimum of 15 minutes. Agitate disposable heparinized syringe at least 45 seconds.**

20. Dispose of needle in biohazard sharps container.

21. Place capped syringe in basin of ice chips. Ice helps the metabolization of oxygen in the blood.

22. Apply sterile dry gauze square or bandage over puncture wound, after pressure is released and bleeding has stopped.

23. Re-confirm patient name/hospital number prior to labeling specimen. Specimen should be labeled at collection site in the presence of the patient with the following:
   a. *Patient's name*
   b. *Hospital number or DOB*
   c. Room number
   d. Date and time of collection
   e. O2 concentration
   f. Temperature
   g. Test to be run
   h. Full signature and title of person collecting the specimen

*These are mandatory patient identifiers. Misidentification of the patient and mislabeling of the specimen can have adverse results for the patient.*
23. Send specimen in basin of ice chips with the transmittal immediately to the laboratory for analysis. **Must arrive in the lab within 15 minutes.**

24. Discard gloves, and wash hands.

25. Observe puncture site for a few seconds after pressure is released to ensure that the clot does not break loose and allow bleeding to occur unattended.


27. Observe for evidence of arterial occlusion due to damage of vessel walls (i.e., check color, temperature, and pulse of extremity used. This is rare but could occur, especially in a patient with arterial disease. If such patients have poor arterial blood flow - occlusion and ischemia to the extremity could result.

**Documentation**

1. Date, time and site of arterial puncture.  
2. Physician ordered sample or reason for obtaining specimen.  
3. Appearance of site and extremity, post-puncture.  
4. Problems and nursing interventions.  
5. Patient tolerance  
6. Physician notification of blood gas results

**General Guidelines for Patient and Specimen Identification and Labeling**

**General Information**

♦ Positive patient identification is the first and one of the most important steps in assuring accuracy of patient care delivery.

♦ Whenever possible, identifying the patient prior to obtaining a specimen for clinical testing should include asking "What is your name?" rather than, "Are you...?" Verification information, such as Medical Record Number, Social Security Number, or birth date should follow. When a wristband is worn, this information should match the information on the labeled specimen.

♦ Labeling of the specimen should occur in the presence of the patient. This allows a double check of patient information on the wristband, the specimen label, and the requisition/chart. This also prevents mislabeling with another patients specimen labels.

♦ Any specimen requiring testing performed by the Blood Bank/Transfusion Service, MUST have the identification of the person who collected & labeled the specimen plus the I.D. of a witness.

**Inpatient Identification Policy**

♦ All patients should have an identifying wristband with full name and medical record number. This information must match exactly with the information on the transmittal forms/requisitions and labels.

♦ Verbal information from a family member alone or information off a nametag attached to a bed is not acceptable for positive patient identification.

♦ All specimen containers (blood, urine, body fluids, cytology, histology, etc.) must be identified with at least the following information:

  1. * Patient Name* (Last, First, Middle initial, if available)  
  2. * Identifying number* (Medical Record Number) or DOB  
  3. * Patient Location* at the time of collection (ward/room)  
  4. * Date and Time of Collection*  
  5. * Collector*: Initials of the individual collecting the specimen.  
  6. **Blood Bank Specimens**: Each specimen **MUST** have the full signature of the person drawing the sample plus the full signature of a witness verifying that the sample is labeled with the correct information from the patient's wristband.

  7. **Specimen type** or source when not apparent.

* These are mandatory patient identifiers.
Outpatient (Hospital-based) Clinics

♦ Patient will present with an outpatient registration form that has the full name and medical record number (Social Security Number). This information must match exactly with the information on the transmittal form/requisition or draw labels.
♦ Phlebotomists will further confirm a patient's identity by asking the patient his/her name and DOB.

Outreach (Clients-reference testing)

All specimen containers (blood, urine, body fluids, cytology, histology, etc.) must be identified with at least the following information:

1. *Patient Name* (Last, First, Middle initial, if available)
2. *Identifying number* (Date-of-Birth, Social Security Number, or other, unique identifier)
3. *Patient Location* (OP, indicating outpatient sample)
4. *Date and Time of Collection*
5. *Collector: Initials of the individual collecting the specimen.*

*These are mandatory patient identifiers.* All specimens must be accompanied by a requisition.