

EXERCISE 2: VENIPUNCTURE USING VACUUM COLLECTION SYSTEM

Skills 30 points

Objectives

1. Identify the routine site and three alternate sites for venipuncture.
2. List the three veins of the forearm used for venipuncture, describe where they are positioned, order of selection and the reason for the selection order.
3. Demonstrate concern for the safety and welfare of yourself and others by consistently using appropriate infection control techniques.
4. Demonstrate appropriate concern for your classmate by explaining the procedure.
5. State the importance and proper method for identifying patients in the hospital and out patient settings.
6. Describe and demonstrate the steps in the selection and preparation of the venipuncture site.
7. Describe the appearance of a properly applied tourniquet, maximum time it may be applied and the effects of tourniquet application and hand squeezing on the quality of the sample.
8. List and describe the equipment and supplies necessary for performance of the venipuncture.
9. Recognize proper needle insertion and withdrawal techniques including direction, angle, depth, aspiration and number of times the procedure may be attempted.
10. List, in chronological order, the correct steps in the proper performance of a venipuncture using the vacuum blood collection system
11. State the correct order of the draw.
12. State the reason that the correct order of the draw must be followed.
13. List ten stopper colors, additive present and laboratory tests which will be drawn into each.
14. State when, where and the minimum information which must be present for labeling blood samples.
15. List and describe problems which may be encountered during blood collection.
16. State the maximum number of attempts for performing a venipuncture.
17. State the consequences of placing a tourniquet above an IV site.
18. State the problems which may occur if a sample is drawn above an IV and how this will affect the quality of the laboratory samples.
19. State the proper protocol when samples must be collected above an IV.
20. State the appropriate action which must be taken when a patient refuses to have their blood drawn.
21. List six reasons that a blood sample might be rejected by the laboratory.
22. List the steps to follow after an accidental needle stick.
23. Define "hematoma" and state the cause.
24. List the steps to follow when a patient appears about to faint or is fainting.
25. Perform three successful venipunctures on the artificial arm and one successful live draw with minimum stasis and trauma and no contamination.

Revised: December 13, 2010

Discussion

Clinical laboratories perform blood analyses on venous blood samples collected by phlebotomy. To collect a venous blood sample, the phlebotomist pierces the vein with a hypodermic needle and draws the blood into a syringe or uses a commercially available apparatus specifically designed for collecting venous blood, such as the vacuum collection system. The goal of venipuncture is to obtain a blood sample from the correct patient into the correct tube with minimal trauma or stasis. Venipuncture is an invasive procedure and requires a certain degree of skill.

Vacuum Blood Collection System

The vacuum system consists of a double-pointed needle, a plastic holder or adapter, and a series of vacuum tubes with rubber stoppers of various colors, the colors indicate the type of additive present. Another kind of holder is available, which allows resheathing of the needle with the holder after venipuncture. Blood collection using the evacuated tube collection system will produce the **best** blood samples for analysis by the laboratory. The blood goes directly from the patient into the appropriate test tube.

Blood Collection Needle

The vacuum collection needle is pointed at both ends, with one end shorter than the other. The long end of the needle is used for insertion into the vein, the shorter end is used to pierce the rubber stopper of the vacuum tube and usually is covered by a rubber sheath. The sheath makes it possible to draw several tubes of blood by preventing leakage of blood as tubes are changed, this is called a multi-draw or multi-sample needle. If the short end is not covered with a rubber sheath, it is a single sample needle and only one tube of blood can be collected.

There are several sizes of needles available, the size depends on the length and *gauge* of the needle that goes into the vein. Blood collection needle lengths range from 1 to 1 ½ inches. One inch needles are used for routine venipuncture, 1 ½ inch needles are used for patients with very deep veins. The gauge of a needle is a number that indicates the diameter of its *lumen*; the lumen, also called the bore, is the circular hollow space inside the needle. The higher the gauge, the smaller the lumen. The most frequently used gauges for phlebotomy are 20, 21 and 22.

The *bevel* is the slanted opening at the end of the needle. The phlebotomist performs a venipuncture so that the bevel of the needle is **facing upward** when the needle is inserted into the vein. Blood collection needles come in single use, sterile packages, either peel apart envelopes or plastic cases.

Holder

The vacuum collection system holder is a plastic sleeve into which the phlebotomist screws the double pointed blood collection needle. Holders are available in two sizes, one for adult venipuncture and one for pediatric procedures. All holders are single use, with some having an integral safety device which covers the needle after use, and the entire apparatus is disposed of in a sharps container after blood collection.

Blood Collection Tubes

Blood collection tubes are glass or plastic tubes sealed with a partial vacuum inside by rubber stoppers. Standard practice in the field is moving to the use of plastic tubes for blood collection to increase safety of the procedure. The air pressure inside the tube is negative, less than the normal environment. After inserting the longer needle into the vein, the phlebotomist pushes the tube into the holder so that the shorter needle pierces the stopper. The difference in pressure between the inside of the tube and the vein causes blood to fill the tube. The tubes are available in various sizes for adult and pediatric phlebotomies. Adult tubes have volumes of 5, 7, 10 and 15 mL and pediatric tubes are available in volumes of 2, 3 and 4 mL.

Different blood tests requires different types of blood specimens. For instance, some specimens require the addition of an *anticoagulant* in the tube. The anticoagulant prevents blood from clotting, resulting in a whole blood sample, one in which the cells are free in the plasma. If an anticoagulant is not present the blood will clot, coagulation factors present in the fluid portion of the blood cause the cellular components to clump together. It is of critical importance

that the phlebotomist knows which type of tube to draw for each test ordered. The collection of the blood in the wrong type of tube will result in the patient having to be stuck again.

In the vacuum blood collection system, the anticoagulants are already in the tubes in the precise amount needed to mix with the amount of blood that will fill the tube. The color of the stopper on each tube indicates what, if any, anticoagulant the tube contains. It is important to completely fill each tube so that the proportion of blood to chemical additive is correct, otherwise, the test results may not be accurate **or** the specimen will be rejected and will need to be recollected. Sodium citrate has a ratio of 1 part anticoagulant to 9 parts blood.

The following table lists the contents of the vacuum tube, the color of the stopper and what each type of specimen is used for. **MEMORIZE THIS TABLE.** This table contains only the most commonly used anticoagulants, there are many more. The tubes are listed in the correct order of the draw with the exception of the last three. For royal blue, put in the order based on the additive. For yellow (ACD) and black, refer to your institution's SOP. **PRINT OUT HANDOUT FROM WEB PAGE AND FILL IN. Daily quizzes will be given over this information.**

STOPPER COLOR	ADDITIVE	SPECIMEN USAGE
Yellow Blood Culture Bottles	Sodium polyanetholesulfonate (SPS) Additives to keep microorganisms alive.	Blood Cultures
Blue	Sodium Citrate	Coagulation studies: PT, PTT and fibrinogen
Red - plastic Red/Black or Gold SST	Cot activator Clot activator and a polymer gel for serum separation	Tests using serum: chemistry, serology and immunoematology (blood bank) All tests using serum except blood bank
Green Green/Black-PST	One of the following: sodium heparin, lithium heparin or ammonium heparin. Heparin and polymer gel to separate plasma.	Blood chemistries utilizing plasma.
Brown or Tan	Sodium Heparin or EDTA	Lead levels
Lavender	K ₂ EDTA (ethylenediaminetetraacetic)	Hematology studies: CBC, WBC count, Hemoglobin, Hematocrit, Platelet count, Reticulocyte count, differential.
Pink	K ₃ EDTA	Blood bank testing using gel system.
Gray	Potassium oxalate and sodium fluoride or Na ₂ EDTA and sodium fluoride OR sodium fluoride	Glucose, Blood Alcohol (ethanol) levels, lactic acid
Royal Blue	Color of tube label indicates additive: purple - EDTA green - heparin red - none	Trace metal analysis for: Antimony Arsenic, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Zinc. Also , nutrients and toxicology studies.
Black	Buffered Sodium Citrate	Westergren sedimentation rate
Yellow	Acid Citrate Dextrose	Genetic testing

The Clinical Laboratory Standards Institute (CLSI) provides national standards for clinical laboratories. The following “ORDER OF THE DRAW” is based on these recommendations.

The *sequence of collection of evacuated tubes* in a multi-draw should be in this order:

1. Sterile/Blood cultures (yellow top or bottles)
2. Light Blue coagulation tube
3. Red - Non-Additive
4. Gel separator tube (speckled, “tiger” top or gold) - SST - serum separator tube
5. Green (heparin)
6. Plasma Separator Tube (PST) with heparin (green-gray mottled top)
7. Lavender/purple or pearl (EDTA)
8. Gray top (Oxalate/fluoride tube)

When drawing blood for a blood profile or panel (many different types of laboratory tests are ordered) the phlebotomist fills several vacuum collection tubes, each with a different color stopper appropriate for each test ordered. This is called a multiple draw, or **multi-draw**. This is necessary to avoid contaminating the blood in one tube with traces of chemicals from a previous tube that might alter the test results.

The order of the draw is **CRITICAL** due to the potential for carryover of additive in the tube to the next tube which will adversely affect the results of laboratory testing. For example, EDTA binds calcium, so if the EDTA tube is collected before the heparin tube the EDTA will cause falsely decreased calcium levels, as well as interfering or altering a number of other tests. The plastic red stoppered tubes have a clot activator, if these are drawn before the light blue coagulation tubes erroneous coagulation results will be obtained.

Tubes containing additives must be gently mixed when removed from the blood collection needle so the substance can mix with the blood to prevent coagulation. If the tubes are not adequately mixed clots will form in the sample and it will need to be recollected.

When drawing tubes for multiple tests one tube of the appropriate color may be used to perform multiple tests. For example, a reticulocyte count and complete blood count are ordered. Both require a lavender stoppered tube. You would **NOT** draw one lavender tube for each test, instead you would draw **ONE** lavender tube for both tests. Always check with your facility to determine how many tubes to draw. There are times when some tests are performed on site and some tests are sent out. In this situation you may need to draw more than one tube of the same stopper color so each department/facility will have a sample.

Patient Identification and Preparation

It is *vitally important* that the phlebotomist correctly identifies the patient. **Do not offer** the patient a name to respond to, since many patients are hard of hearing and will respond affirmatively to any name you give. All hospitalized patients have an identification arm band with their name, hospital identification number and other pertinent information. **Always** compare the laboratory test request slip name and ID number with the name and ID number on the patient's hospital arm band. If there is **any** discrepancy, **do not draw the patient's blood**. Report the discrepancy immediately to the nurse in charge of the unit. If there is a genuine error on the patient's arm band and the nurse asks you to go ahead and draw the blood before a corrected arm bank is available for the patient, let the nurse take the responsibility of the patient identification by initialing the blood tube and the request slip.

For an out-patient, verify the patient's identity by having the patient give you additional identifying information such as a social security number, date of birth or address.

Before beginning a venipuncture, the phlebotomist must wash his or her hands and follow Standard Precautions (refer to Exercise 1). Explain the procedure to the patient. Most patients have previously had their blood drawn. An appropriate question to ask is, "Have you ever had your blood drawn before?". If the patient has never had blood collected before, the phlebotomist should help prevent anxiety by explaining the procedure to the patient. Be honest, tell the patient the amount of discomfort that will be felt is like a little pinch. This procedure is known as "informed consent". The patient has the right to know what is involved in the medical procedure being performed. If the patient asks what the test is for tell them that their physician has ordered some laboratory tests to monitor their condition, the results will be available to the physician later and the patient can check with him or he later about the results. You **must never** tell the patient what tests are ordered or share results of testing.

Choose the appropriate vacuum tubes for the tests requested and, after collection of the samples, label the tubes appropriately. **NEVER LABEL TUBES BEFORE COLLECTING THE SAMPLE**, as this may result in a mix up of blood specimens should the first venipuncture be unsuccessful and empty, labeled tubes are left on the tray. Label the tubes at the patient bedside, never take the tubes to another location to label them, this breaks the chain of identity of the blood specimens with the patient.

Most laboratories have instructions for the phlebotomist as to the number and stopper color of tubes needed for all of the tests that they perform.

Position the patient so he or she is comfortable and safe in case the patient becomes faint and falls. Hospitalized patients should always be drawn when they are reclining in bed. Out-patients should be seated in a phlebotomy chair which has a locking arm in front for support of the arm and body.

Feeling faint is a fairly common problem for patients when having blood drawn, particularly in out-patient situations. When performing phlebotomy, know where first aid treatment kits are located. If the patient appears pale or complains of feeling faint, ***immediately remove the needle from the patient's arm*** and have the patient breathe slowly and deeply. Have the patient lower his or her head below the knees and use an ammonia capsule if the patient loses consciousness. If this treatment is not effective, call for assistance immediately. Remain with the patient until he or she is fully recovered. Be prepared to catch or break the fall of any patient who might faint.

After collecting the required blood samples, record the patient's full name, ID number, the date and time of collection, and your initials on each vacuum tube collected. Many laboratories utilize computer generated labels to put on the blood specimen. These labels generally contain the patient's name and identification number and the name of the test ordered. When computer labels are used the appropriate label is placed on the tube of blood and the date, time and initials are written on the label. Other information may be required on the tube by the particular laboratory protocol.

Site Selection and Preparation (refer to pages 23-27 of this lab)

The selection of the best site to perform a venipuncture is aided by the use of a *tourniquet*. The most common type of tourniquet used is a thin, rubber strap which is applied above the elbow to constrict blood flow and make the veins more prominent. Velcro tourniquet are also available. The tourniquet is tied in such a way that it can be removed with one hand. Do not apply the tourniquet so tight as to *prevent* flow of blood in the arteries but just tight enough to stop the flow of blood in the veins.

If the skin appears blanched above and below the tourniquet it is too tight. If your finger can be inserted between the tourniquet and the patient's skin it is too loose. Take the tourniquet home and practice on family members. The more you practice applying the tourniquet the easier it becomes.

After applying the tourniquet to the arm, choose the puncture site. The arm has many veins from which to choose a venipuncture site. Use the large veins of the forearm which are the median cubital, cephalic or basilic veins for venipuncture. The basilic vein veers toward the anterior surface of the forearm and is joined to the cephalic vein by the median cubital vein. These veins are ideal for venipuncture due to their fairly large size and the fact that most are well anchored in tissue and will not "roll". The correct order of use is: 1) median cubital 2) cephalic and 3) basilic. The basilic vein lies close to the brachial nerve and artery, and for this reason should be used only if necessary. The blue superficial veins of the forearm *are not* adequate for a venipuncture.

To determine if the site is adequate use the fingertips to palpate the veins to determine their direction, depth and size. Choose the veins that are large and accessible. Large veins that are not well anchored in tissue frequently roll, so if you choose one, be sure to secure it with the thumb of your nondominant hand when you penetrate it with the needle. Do not choose veins that feel hard (sclerosed).

Blood is not easily collected from veins that are scarred or sclerosed from repeated use, they are difficult to enter, and if obstructed or occluded will not permit blood to flow through them. Study the diagram on page 25 for the veins of the arm **and memorize them**.

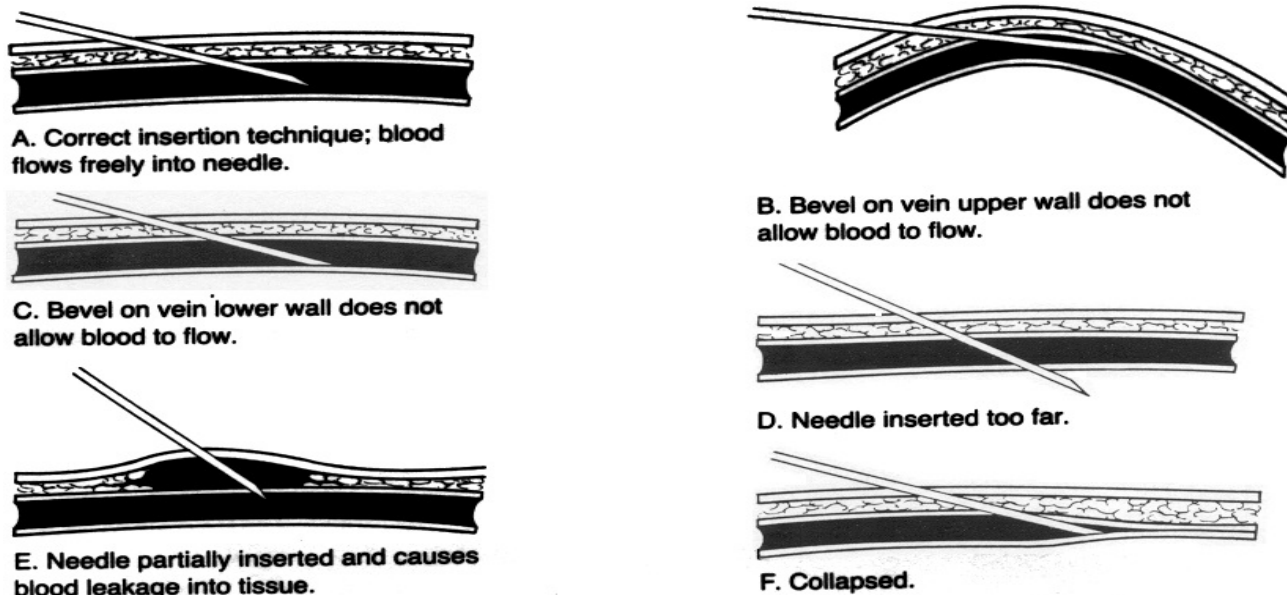


Figure 10–6 Proper and improper needle positioning. **A.** Proper needle position. **B.** Needle bevel against the upper wall of a vein. **C.** Needle bevel against or embedded in opposite wall of vein. **D.** Needle inserted all the way through a vein. **E.** Needle partially inserted into vein. **F.** Needle in collapsed vein.

After selecting a vein, clean the puncture site with a cotton ball saturated with 70% isopropyl alcohol or prepackage alcohol swabs. Rub the alcohol swab in a circular motion moving outward from the site (figure 7). Use enough pressure to remove all perspiration and dirt from the puncture site.

Discreetly look at the swab when finished, if it appears excessively dirty repeat the cleansing process with a fresh alcohol swab. After cleansing *do not touch the site*, if the vein must be repalpated the area must be cleansed again.

Hold the prepared holder and needle with the bevel of the needle facing you in your dominant hand. Use the thumb of the nondominant hand below the puncture site to anchor the vein and pull the skin taut. The needle entering the site should *not* touch the thumb of the phlebotomist. Position the needle in the same direction as the vein, enter the skin and penetrate the vein at a 15 degree angle in one swift, smooth motion to decrease the patient's discomfort. If you enter too slowly blood will leak out at the puncture site creating a biological hazard as well as obstructing your view of the puncture site. The bevel of the needle should enter and remain in the center of the vein.

When using the vacuum blood collection method for multi-drawing, prevent movement of the holder, or the needle may accidentally be pulled from the vein especially while switching tubes. Be sure that the needle is a multi-draw needle, or blood will leak into the holder when the initial tube is removed, creating a biological hazard. It is recommended in the literature that the tourniquet should be released as soon as the blood begins to flow into the tube. Based on personal experience, I recommend that the tourniquet be released as the last tube is filling.

When all tubes of blood have been collected, remove the last tube from the holder, place a cotton ball or gauze over the site and withdraw the needle in a smooth and cautious manner so as not to bruise the vein.

After withdrawing the needle fully, apply pressure to the cotton ball over the puncture site and, if the patient is able, ask him or her to hold pressure on the site for 3 to 5 minutes until the bleeding stops. If the patient is asleep, unconscious or uncooperative, hold the cotton for him or her.

Activate the needle safety device and discard the entire assembly into a biohazard container. Immediately invert gently any tube containing an anticoagulant at least five times or until the anticoagulant is thoroughly mixed with the blood. This may be done while observing the patient for any signs of fainting.

The patient is always the first concern on the phlebotomist. The puncture site must have pressure applied for 3 to 5 minutes to prevent the formation of a **hematoma**. A hematoma is caused by blood leaking from the vein into the tissues resulting in the formation of a bruise.

Problems Encountered During the Venipuncture

In the event that you have been unable to puncture the vein immediately, use your free index finger to locate the vein. It may be that the needle has not gone in deeply enough or perhaps it is **slightly** to the left or right of the vein. This is painful to the patient and may cause tissue damage. Carefully withdraw the needle until the point is almost to the surface of the skin, and redirect the needle.

This procedure is acceptable if the needle is close to the vein, but care should be taken that the patient is not caused too much pain. **Never go "digging" for veins**. Sometimes a second venipuncture on the opposite arm is necessary. If a second unsuccessful attempt is made it may be best to have a different phlebotomist perform the venipuncture. The policy of most facilities is a maximum of 3 unsuccessful tries. But after you have missed a patient 2 times in a row both you and the patient have lost confidence which will probably lead to a third unsuccessful try.

If a patient is receiving intravenous infusions into both arms, it is acceptable to puncture the vein 3 or 4 inches **below** the site of the IV device. **Never** place a tourniquet on an arm **above** the IV site, because you may dislodge the IV needle placement, resulting in infiltration of tissues with the IV fluid. Never draw blood from above an IV site because the blood will be contaminated with the IV fluids resulting in inaccurate results.

If the blood must be drawn above an IV site have the nurse turn the IV off, wait 5 minutes, perform the venipuncture discarding the first tube of blood drawn. After collection of the samples have the nurse turn the IV back on.

If the area surrounding the puncture site begins to swell during the venipuncture, this usually indicates that the needle has gone through the vein or that the bevel of the needle is halfway out of the vein and there is a leakage of blood into the tissues which may result in the formation of a **hematoma**. The tourniquet should be released and the needle withdrawn immediately, with pressure applied to the site after needle removal.

In some instances it is almost impossible to locate a vein in the arm. *In such a case, the veins of the lower arm, hand or foot can be used.* NEVER use veins located on the underside of the wrist as these may be close to arteries. The student should gain a reasonable amount of skill and confidence and should have observed this type of procedure before attempting a venipuncture in these areas. **Special permission from**

the physician may be required prior to drawing blood from these sites. Check your laboratories policies before proceeding.

Always treat the patient with respect, even when they are not respectful of you. Patients are usually in the hospital because of a severe illness or injury and do not feel good. It seems like people are constantly coming in to poke or prod them preventing them from getting the rest they need. They may be extremely irritable and decide that you are a good target to vent their frustration out on. In this type of situation it is extremely important to act in a tactful, professional manner. If the patient refuses to have his or her blood drawn, speak to them calmly and indicate that the blood tests are important in monitoring their condition. If they still refuse do not attempt to perform the venipuncture. When patients are uncooperative there is a very real chance that a needle stick injury will occur. Notify the patient's nurse or the charge nurse that the patient refuses to be stuck so that the doctor can be notified.

Sources of Error:

1. Failure to insert the needle completely into the vein. The phlebotomist should feel resistance initially following insertion of the needle. The resistance is almost immediately followed by a sensation of free or easier movement as the needle enters the vein. When the phlebotomist no longer senses that the needle has been inserted into the vein, the evacuated tube should be pushed onto the needle - NOT before.
2. Puncturing the stopper before entering the vein. If the phlebotomist partially pushes the evacuated tube onto the needle before inserting the needle into the vein, he/she risks puncturing the stopper and releasing the vacuum.
3. Retouching the site just before inserting the needle. If you are going to repalpate, you must either cleanse your index finger before repalpating (this technique is debatable) or, preferably, recleans the site before puncture.
4. Not anchoring the vein before inserting the needle. The vein must be held in place for successful needle penetration. Failure to anchor vein may result in the vein rolling to the side of the needle.
5. "Bouncing" the needle on the skin before guiding it into the vein. During venipuncture, the patient must only be stuck once with the needle. If the needle becomes contaminated it must be changed.
6. Not keeping the holder stationary, causing the needle to dislodge from the vein when tubes are changed.

Rejection of Samples

The quality of laboratory results are directly affected by the quality of the blood sample obtained from the patient. Samples may need to be rejected as unacceptable for the following reasons:

1. **Hemolysis** - this is usually caused by a procedural error such as using too small of a needle, or pulling back too hard on the plunger of a syringe used for collecting the sample.
2. **Clotted** - failure to mix or inadequate mixing of samples collected into an additive tube.
3. **Insufficient sample (QNS)** - certain additive tubes must be filled completely. When many tests are ordered on the same tube be sure to know the amount of sample needed for each test.
4. **Wrong tube** collected for test ordered.
5. **Improper storage** - certain tests must be collected on ice, protected from light, or be kept warm after collection.
6. **Improperly labeled**

First Aid Following Accidental Needle stick

Regardless of the disease the patient has, be careful not to stick yourself with a used needle. If an accidental stick does happen, *immediately*

1. Go to the sink, turn on the water, and bleed the site well by alternating squeezing and releasing the area around the site.
2. Do this for approximately 3 to 5 minutes.
3. Afterwards scrub the site with an alcohol swab.
4. Follow with a thorough hand washing.
5. **Report it to your supervisor immediately.**

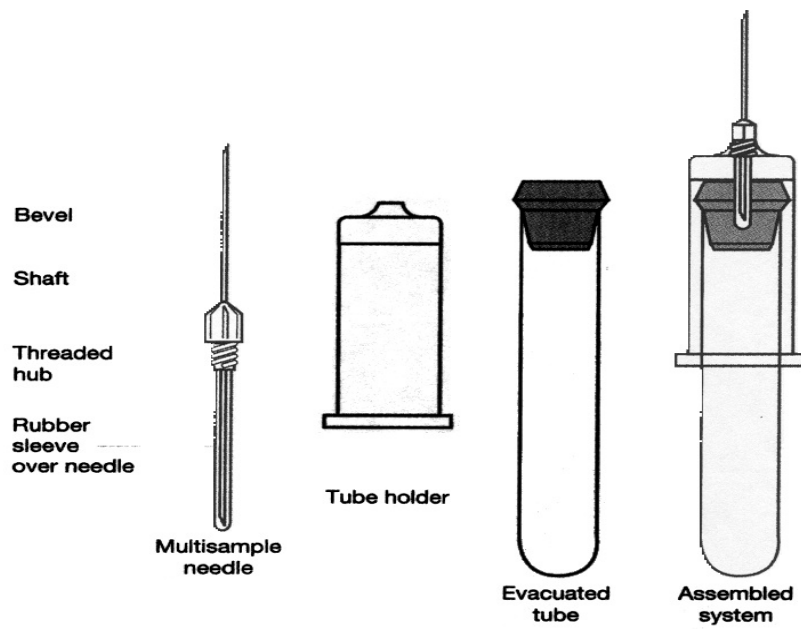
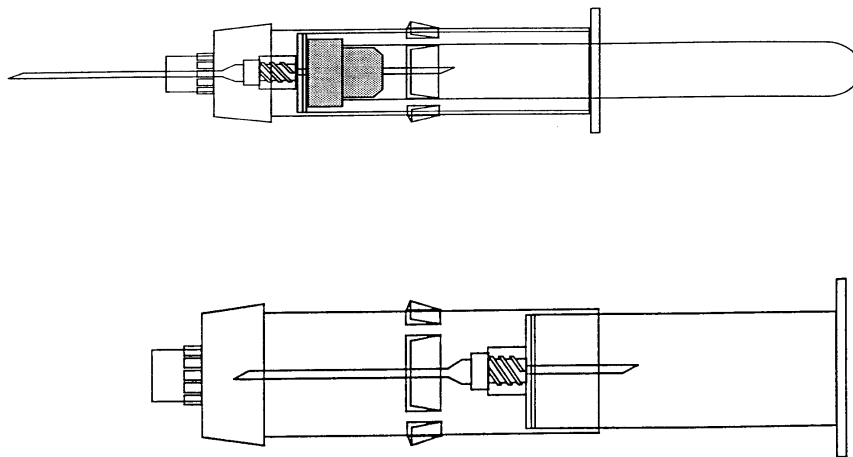
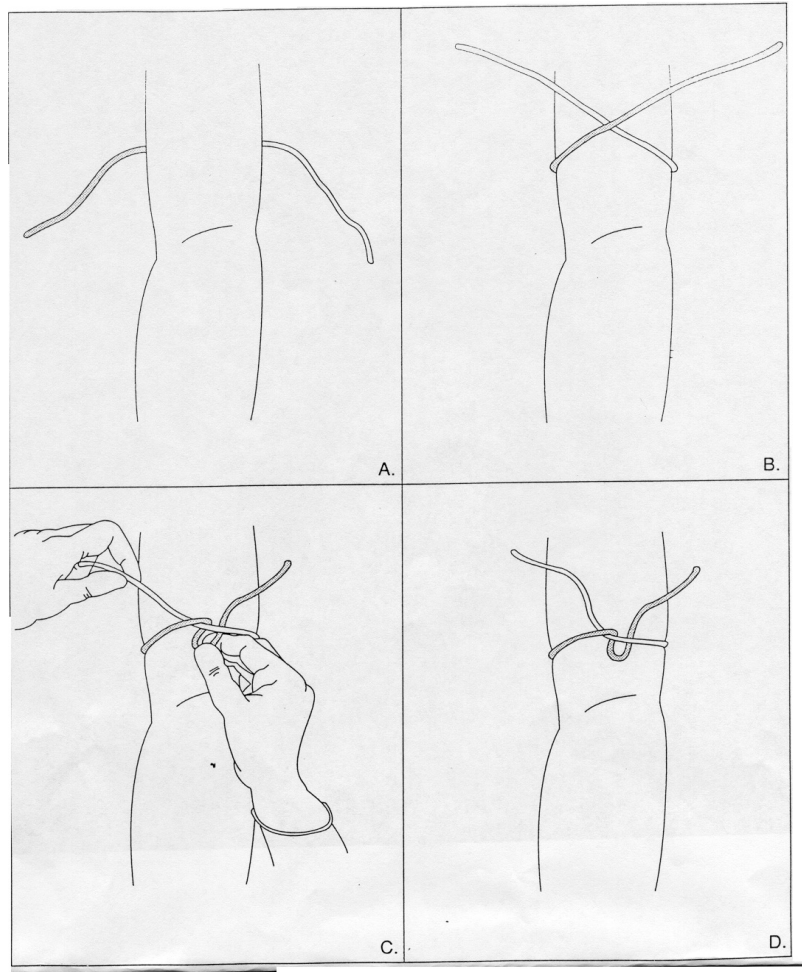


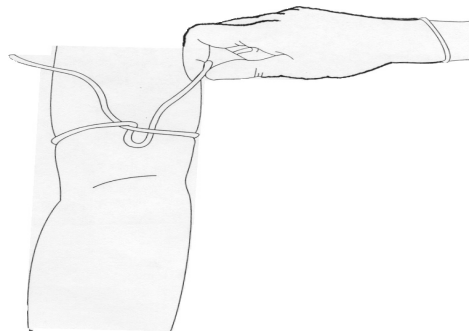
Figure 7-6. Components of the evacuated tube system, p. 157. Copyright © 1998 Lippincott-Raven Publishers, McCall and Tankersley's *Phlebotomy Essentials*, second edition.



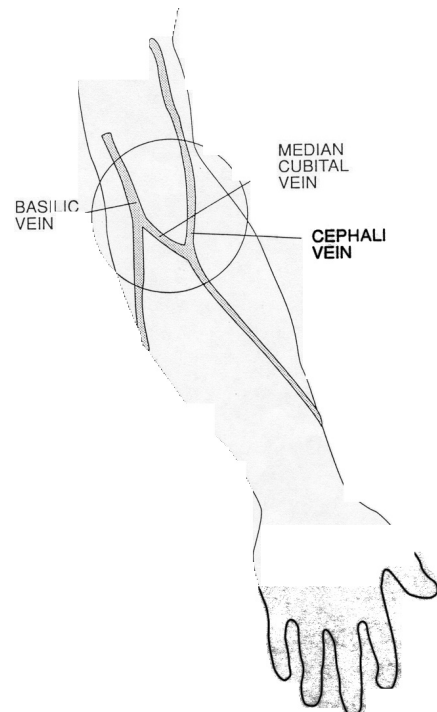
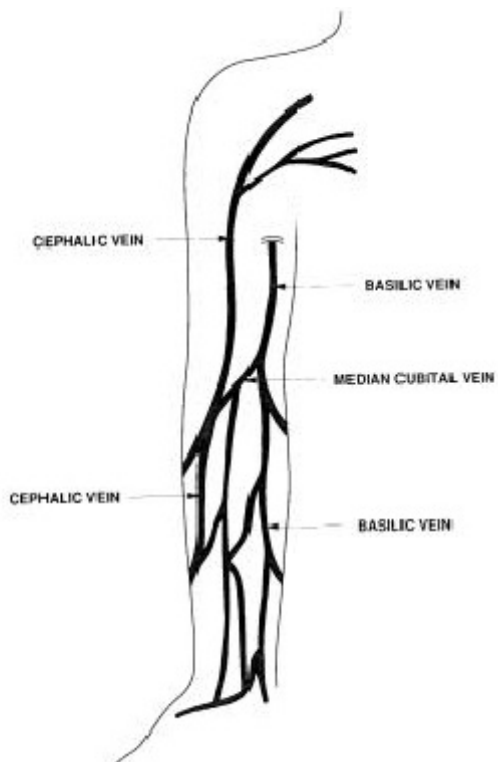
Tying the Tourniquet



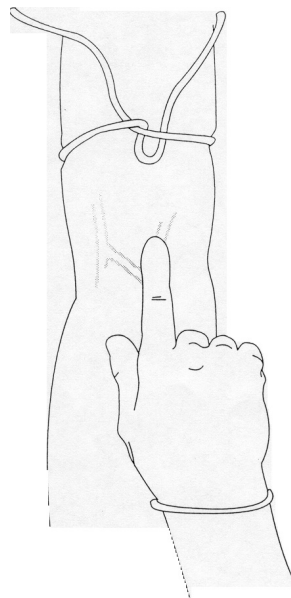
Releasing the Tourniquet



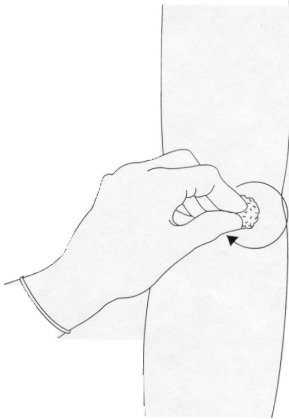
Selecting the Vein



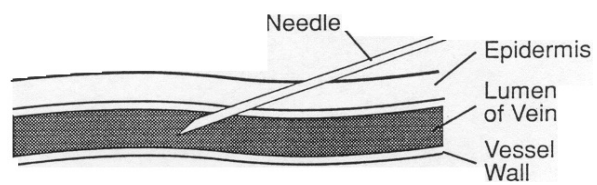
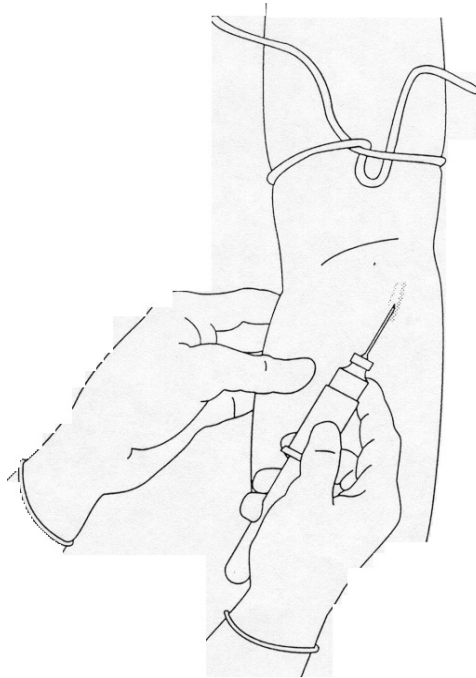
Palpating the Vein



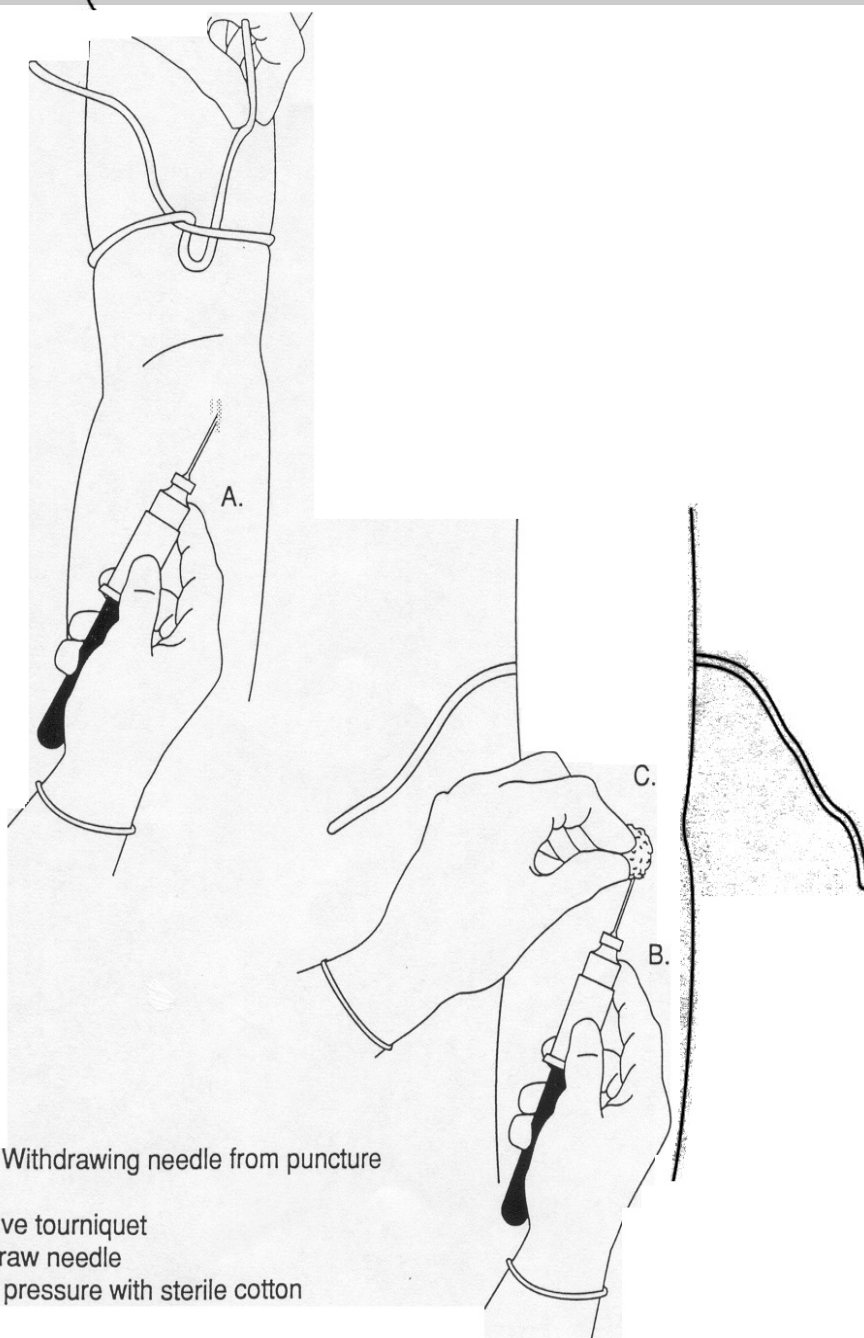
Cleansing the Site



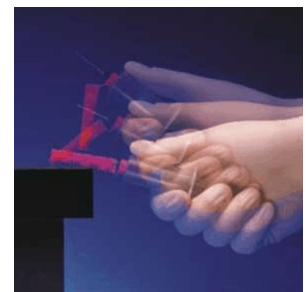
Performing the Venipuncture



Completing the Venipuncture- Always remove the tube from the back of the needle FIRST.



BD Eclipse



Portex Needle Pro

Procedure 1: Venipuncture on the Artificial Arm

Introduction:

Quality test results depend heavily on proper patient identification and preparation. The student phlebotomist should "interview" the artificial arm to determine both the patient's identity and the patient's adherence to preparation guidelines. Not all laboratory tests have special patient preparation guidelines. In fact, most do not. However, the phlebotomist must remember to screen the patient regarding these guidelines whenever appropriate. You will practice on the artificial arms and must perform 3 successful multi-draws (two to three tubes of blood drawn).

Materials:

1. Artificial arm
2. Holder
3. 21 or 22 gauge multi-sample needles
4. Tourniquet
5. Alcohol pads
6. Vacuum tubes
7. Gloves
8. Sharps container
9. Test tube rack
10. Trash can

Instructions:

Each venipuncture must be witnessed and evaluated by your lab partner or instructor, using the checklists. Your partner must fill out the checklist for your third successful stick.

Remember the purpose of this exercise is to allow you to learn and develop good venipuncture technique. Don't be shy about *tactfully* calling your lab partner's attention to mistakes which are made.

Under the "COMMENTS" section of the check off sheet write appropriate feedback such as, "Good job. Continue to work on holding the needle stationary while changing tubes."

Procedure:

NOTE: This is an overview of the steps of the procedure. You will be using the evaluation sheets in this lab to evaluate each other on the draws.

1. Watch instructor demonstration of venipuncture on the artificial arm.
2. Wash hands.
3. **Role play:** Approach the patient, identify yourself, the department you represent, and the procedure you are about to perform., identify the patient and explain the procedure to the patient.
4. Apply the tourniquet and examine the arm for palpable veins.
5. Palpate the veins.
6. Release the tourniquet, cleanse the chosen site with a 70% alcohol swab. Begin at the puncture site selected and move the alcohol pad outward, in concentric circles.
7. Allow the site to air dry.
8. Assemble equipment and supplies.
9. Prepare the vacuum blood collection system by attaching the needle to the hub and positioning a tube in the holder.
10. Reapply the tourniquet, making sure that the ends do not touch the prepared site.
11. Ask patient to clench fist tightly.
12. Position the holder in the palm of your hand between your thumb and index finger. Your palm should be pointing to the left if you are right-handed, and to the right if you are left-handed.
13. Uncap the needle and inspect for manufacturer's defects.
14. Anchor the vein selected, using the thumb and index finger.
15. Position the needle in the same direction as the vein selected. Insert the needle, bevel up, at a 15-degree angle. The needle should be inserted in one quick, smooth motion.
16. Release the vein and push the evacuated tube onto the back of the needle applying counter pressure to the holder. Be sure to keep the holder stationary. Once the tube has been pushed onto the needle, take your hand off of the tube. If the stopper of the tube has been punctured by the back of the needle, and blood is not entering the tube, pushing on the tube will *not* cause blood to enter it.
17. Allow the tube to fill, when the vacuum has been exhausted, blood will no longer enter the tube.
18. Keeping the holder absolutely still, pull the evacuated tube off the back of the needle using counter pressure on the holder and replace it with the second tube (if the first tube contained an additive, gently invert it while waiting for the second tube to fill).
19. Once blood begins to enter the second tube, release the tourniquet within one minute of application.
20. Pull the evacuated tube off of the needle. Allow it to rest in the holder.
21. Place a piece of gauze or a biowipe over the puncture site, **do not push down.**
22. Remove the needle from the patient's arm and immediately apply pressure with the gauze.
23. Immediately activate the needle safety device and dispose of unit.
24. If the last evacuated tube collected contains an additive, invert gently several times to mix the blood with the additive.
25. Inspect puncture site, apply bandage if needed.
26. Label the tubes collected IMMEDIATELY as follows (this can be done as a role play, pretend to write and state to your partner what you are writing on the tube):
Artificial Arm, Attempt ___ (the number of the attempt), date, time, and your initials
27. Discard materials in appropriate waste receptacle and disinfect work area.
28. Remove gloves, wash hands and leave patient courteously.

Procedure 2: The Unsuccessful Attempt

Introduction:

Venipuncture of the artificial arms is a learned skill. Therefore, it is unrealistic to complete the 3 successful draws in 3 attempts. Students must know how to react if a procedure is not successful in securing a specimen.

If the phlebotomist does not achieve blood flow into the evacuated tube the following steps should be performed.

Procedure:

1. Release the tourniquet.
2. Remove the evacuated tube from the back of the needle.
3. Place biowipe over the puncture site and carefully withdraw the needle.
4. Immediately simulate activation of the needle safety device.
5. Beginning at step #6 of procedure 1, repeat the procedure.

The evaluator should be very critical of the phlebotomist's technique. Remember, the person practicing on the artificial arm today may be your phlebotomist in a few moments. React as though the artificial arm were your own.

Exercise 2: Venipuncture/Vacuum blood collection

Print out the Venipuncture Evaluation Form template from the website.

Name _____

STUDENT RECORD SHEET OF BLOOD COLLECTIONS DONE IN LABORATORY

This form is to be used through out the semester to document blood collections in student laboratory. Keep it at the front of your laboratory notebook. Each successful live arm blood collection or capillary collection counts towards successful completion of the course. MUST DOCUMENT 8 SUCCESSFUL CAPILLARY PUNCTURES.

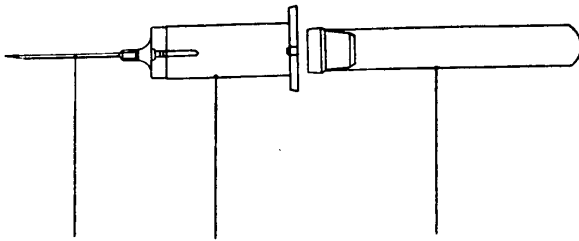
Date	Student Name	Venipuncture	Capillary Puncture	Success	
				YES	NO

EXERCISE 2: VENIPUNCTURE - STUDY QUESTIONS

Name _____ Date _____

Points: 53

1. Label the 3 parts of the vacuum blood collection system. (1.5 points).



2. Define the following terms (0.5 point each)

- a. "needle gauge"
- b. "bevel"
- c. "holder"
- d. "vacuum tube"
- e. "anticoagulant"

3. For each of the stopper colors listed below state the additive in the tube, if this additive produces a serum or plasma sample **AND one test** which is drawn into the tube (1.5 point each unless otherwise noted). Place a check mark in the “serum” or “plasma” column as appropriate.

Stopper Color	Additive Present	Serum	Plasma	Test
a. Red				
b. Red/black mottled or Gold				
c. Light blue				
d. Green				
e. Lavender				
f. Gray				
g. Black				
h. Royal blue				
i. Pink				
j. Brown/Tan				
k. Yellow (2 points)				

4. Describe how a phlebotomist can help prevent anxiety in the patient who has never had his/her blood drawn before. (1 point).
5. Explain why blood collection tubes should *never* be pre-labeled (1 point).

6. Describe the action which should be taken whenever the information on the patient's hospital armband does not match the information on the laboratory requisition slip (1 point).

7. Describe how an outpatient is properly identified prior to drawing a blood sample (1 point).

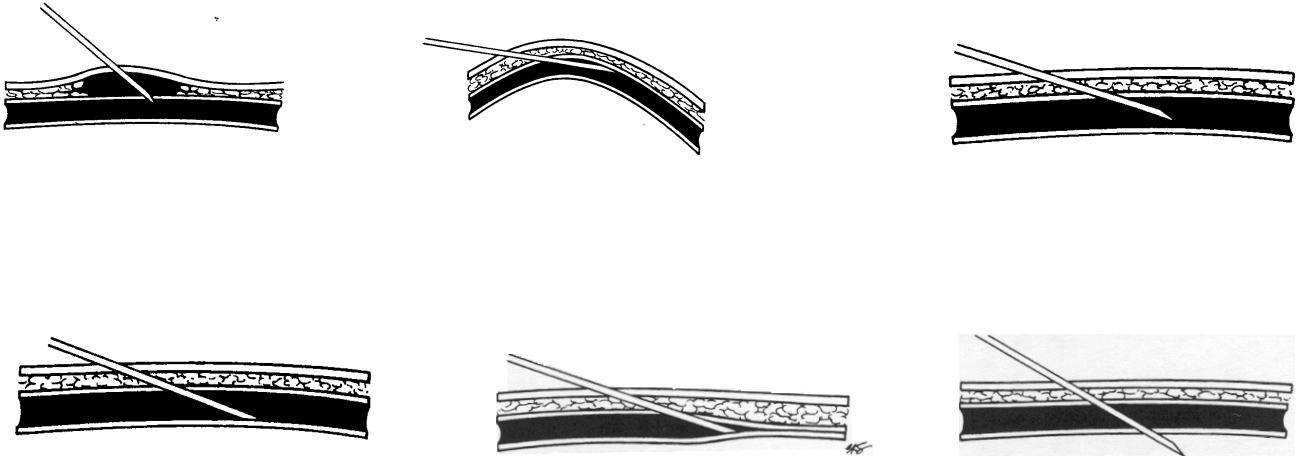
8. List the steps to be performed (in the correct order) when a patient appears about to faint (2 points).

9. Define "tourniquet" *and* describe how the phlebotomist knows when it is inappropriately applied. (2 points).

10. List the 3 veins of choice for performing venipuncture. **Circle** the most preferred vein. (1.5 points).

11. List three sources of error which may be the cause of an unsuccessful **real arm** (not demonstration arm) venipuncture attempt (1.5 points).

12. Describe the following needle positions **CIRCLE** the figure which is **CORRECT**. (3 points)



13. Define "hematoma" and how these are caused during venipuncture (1 point).

14. State the maximum number of venipuncture which should be attempted and why this policy is set (1 point)?

15. State the reason why a phlebotomist must *never* place a tourniquet on an arm above an IV site (1 point).

16. Describe how a blood sample collected at a site above an IV will be affected and how this will impact results of laboratory testing performed on the sample (1 point).

17. List the 4 steps which must be performed when a sample must be drawn above an IV site (2 points).

18. List 3 alternate venipuncture sites in cases when it is impossible to locate a vein in the patient's arm (1.5 points).

19. Briefly describe the 5 steps to follow immediately after an accidental needle stick injury (2.5 points).

20. Describe the proper action to take when a patient initially refuses to have his/her blood drawn (1 point).

21. List the correct order of the draw for blood collected in evacuated tubes in a multi-draw. (2 points).

22. List 4 reasons that a blood sample may be rejected by the laboratory (2 point).
23. **Briefly** summarize the steps for performing a routine venipuncture (2 points).