SUNY DOWNSTATE MEDICAL CENTER
UNIVERSITY HOSPITAL OF BROOKLYN
POLICY AND PROCEDURE

No. VEN-2

Subject: **COLLECTION OF BLOOD SPECIMEN**

Page 1 of 16

Prepared by: Yolaine Henry

Original Issue Date NEW

Reviewed by: Alix R. Laguerre
Peter J. Howanitz, M.D
Marcia Warner, RN
Gloria Valencia, M.D.

Supersedes: 11/05

Effective Date 11/06

Approved by: Peter J. Howanitz, M.D.
Anny Yeung, RN, MPA
Margaret Jackson, MA, RN
David Conley, MBA
Michael Lucchesi, M.D.
Debra D. Carey, MS

The J C Standards : NPSG 1A, NPSG 3D. NPGS 7, PC.16.40, LD.3.50, IM.3.10 IM.4.10

Issued by: **Regulatory Affairs**

I. PURPOSE:

To assure a systematic process and environment where venipuncture and blood specimens collection are consistent with the patient's and the phlebotomist's safety.

II. DEFINITION(S):

Venipuncture: Puncture of a vein for any purpose.

III. POLICY:

Blood specimens must be collected according to the procedures established by University Hospital of Brooklyn to assure quality laboratory results. The phlebotomist must use his/her skills as a collector, in accordance with hospital policies and the National Patient Safety Goals established by JCAHO to collect blood specimens in a safe manner.

IV. RESPONSIBILITIES:

Pathology Staff, Nursing, Medical Staff.

V. PROCEDURES / GUIDELINES:

SPECIMEN COLLECTION STEPS

1. GREET PATIENT: Be professional and friendly: Good Morning, Good Afternoon, etc. ***(Pg. 3)***

2. **IDENTIFY YOURSELF: Always wear employee Identification (ID) card.** ***(Pg. 3)***

3. **IDENTIFY THE PATIENT: Minimum 2 pieces of identification: Patient's Name and Medical Record #, or date of birth.** ***(Pg. 3)***

4. **REVIEW REQUEST FORM AND LABELS.** ***(Pg. 4)***

5. **VERIFY PATIENT'S DIET RESTRICTIONS/REQUIREMENTS FOR TEST/PATIENT, AND ASK NECESSARY QUESTIONS.** ***(Pg. 4)***

6. **EXPLAINS VENIPUNCTURE PROCEDURE TO PATIENT.** ***(Pg. 5)***

7. **OBTAIN BAR CODE LABELS INDICATING NUMBER OF TUBES AND COLOR TOP NEEDED.** ***(Pg. 5)***

8. **ASSEMBLE SUPPLIES REQUIRED/SELECT VACUTAINER TUBES AND INSPECT THEM FOR QUALITY CONTROL.** ***(Pg. 6)***

9. **OBSERVE AND EXAMINE PATIENT'S ARMS/HANDS CONDITION AND CHOOSE VEIN OF CHOICE.** ***(Pg. 6)***

10. **PUT ON PERSONAL PROTECTIVE EQUIPMENT (PPE) AS REQUIRED.** ***(Pg. 7)***

11. **POSITION PATIENT'S ARM/HAND. REQUEST ASSISTANCE IF NECESSARY.** ***(Pg. 7)***

12. **ASK PATIENT TO CLOSE HAND.** ***(Pg. 7)***

13. **SELECT VENIPUNCTURE SITE: Select best vein available.** ***(Pg. 8)***

14. **CLEANSE VENIPUNCTURE SITE: Do not touch or blow site.** ***(Pg. 8)***

15. **APPLY TOURNIQUET: Keep no longer than one minute on arm.** ***(Pg. 8)***

16. **INSPECT NEEDLE: Bevel always up. Notify immediately if any abnormality is found.** ***(Pg. 9)***

17. **PERFORM VENIPUNCTURE: Pay attention to procedure and patient.** ***(Pg. 9)***

18. **FILL TUBE (S) UNTIL VACUUM IS EXHAUSTED: Do not pull out tube if vacuum still present.** ***(Pg. 12)***

19. **ASK PATIENT TO OPEN HAND.** ***(Pg. 13)***

20. **RELEASE TOURNIQUET: Always discard tourniquet after each procedure per patient.** ***(Pg. 13)***

21. **PLACE GAUZE OVER NEEDLE AT VENIPUNCTURE SITE BEFORE WITHDRAWING NEEDLE: May ask patient to help holding while you activate safety device.** ***(Pg. 13)***

22. **REMOVE NEEDLE: Immediately, activate safety device (safety Eclipse needle or butterfly).** ***(Pg. 13)***

23. **APPLY BANDAGE ON VENIPUNCTURE SITE: Be sure bleeding stops before applying bandage.** ***(Pg. 13)***

24. **DISCARD USED ITEMS ACCORDINGLY: Sharps containers for sharp items, clear plastic bags for gloves, gauze, papers (regular garbage). Red plastic bag for blood containing items.** ***(Pg. 13)***

25. **LABEL SPECIMEN (S): Use barcode label or hand written label according to situation. Label and initial specimen requisition form immediately after collection.** ***(Pg. 14)***

26. **FOLLOW SPECIMEN TRANSPORTATION REQUIREMENTS: Specimens in an ice bath, STAT specimens, special request, etc.** ***(Pg. 14)***

27. **ELIMINATE DIET RESTRICTIONS accordingly, when necessary and according to procedure. For example, if fasting was required for testing, inform appropriate personnel of procedure completion.** ***(Pg. 14)***

28. **PLACE SPECIMEN (S) IN SPECIMEN BOX FOR PICK UP BY THE MESSENGER SERVICE, or SEND SPECIMEN DIRECTLY VIA THE PNEUMATIC TRANSPORT SYSTEM IMMEDIATELY AFTER COLLECTION, or DELIVER SPECIMEN(S) PERSONALLY TO THE LABORATORY CENTRAL ACCESSIONING ROOM WHEN NECESSARY.** ***(Pg. 14)***

29. **REMOVE GLOVES and/or Personal Protective Equipment.** ***(Pg. 15)***

30. **INITIAL AND FILE the phlebotomist collection list or request form, and notify the medical staff of any problem.** ***(Pg. 15)***

31. **WASH HANDS OR USE HAND SANITIZER: must wash hands or use hand sanitizer between patients and every time after changing gloves.** ***(Pg. 15)***

32. **ORGANIZE/CLEAN WORKING AREA. GET READY FOR NEXT PATIENT: Always keep necessary items in cabinet. Daily: replace items before going home to be ready for the following day.** ***(Pg. 15)***

VENIPUNCTURE PROCEDURE

The following steps should be part of every successful collection procedure. Prior to performing these steps the phlebotomist should have all protective equipment (PPE), supplies, HDS computer key, KCHC ID card, Phlebotomy Log/Phlebotomist Performance Sheet and pen ready to perform and document the procedure.

1. **GREET THE PATIENT:** Be professional and friendly. "Good morning" or Good Afternoon", etc.

2. **IDENTIFY YOURSELF:** Always wear employee ID card, and lab coat or personal protective equipment.

3. **IDENTIFY THE PATIENT:** Minimum 2 identifiers are required!
   Identification of the patient is crucial. The phlebotomist must ensure that the blood specimen is being drawn from the individual designated on the request form or the Cerner barcode label. Prior to any specimen collection procedure, the patient must be correctly identified using the following steps:

   a. The patient should be asked to state his or her first and last names:
   ALWAYS ask, "What is your name?" and let the patient reply.
   NEVER ask, "Are you Mr. John Doe?"

b. Check medical record number for inpatient collection and date of birth for outpatient collection.

c. More important, a confirmatory match should be made among the patient's response, the test requisition form or computer data, and some type of identification, such as hospital identification bracelet (MR#), a driver's license, or another identification card.

d. Report any discrepancy, however minor, to the supervisor or designee immediately.

If patient is too young, mentally incompetent or does not speak the language of the Phlebotomist, follow the sequence of steps below:

- Ask a relative, guardian or nurse to identify the patient by name, identification number and/or date of birth.
- Compare these data with the information on the request form or cerner bar code label.
- If a translator is needed, request it.
- Enter in HDS comment field (specimen collection screen) who identified the patient.

4. **REVIEW ORDER BEFORE SPECIMEN COLLECTION:** physicians must order laboratory tests. The documented request is usually transmitted in the form of a requisition or computer-generated LABELS. Requests contain the same required information as paper requisition forms. In either case, the requisition should contain the following information:

a. Patient's full name
b. Patient's identification (or medical record) number
c. Patient's date of birth
d. Types of test to be performed
e. Date of test
f. Physician's name and/or code
g. Test status (timed, stat, fasting, etc.)
h. Type of visit (IP, RP, OP, ETC.)
i. Special precautions (potential bleeder, faints easily, type of medication taken, etc.)

Collection requests should be checked prior to the venipuncture procedure to ensure that there are no discrepancies or duplicates in the test orders. If the phlebotomist does not understand the test ordered, the supervisor or the patient's nurse/doctors should be consulted prior to SPECIMEN COLLECTION.

In addition to being prepared with the proper equipment and supplies, and safety precautions, the phlebotomist must be emotionally prepared. Such preparation involves adopting a professional appearance and behavior, as well as exercising good communication skills, both as a listener and as a speaker. Always follow the three major points common to most ethical standards:

- DO NO HARM TO ANYONE INTENTIONALLY
- PERFORM ACCORDING TO SOUND TECHNICAL ABILITY AND GOOD JUDMENT

- RESPECT THE PATIENT'S RIGHT (CONFIDENTIALITY, PRIVACY, THE RIGTH TO KNOW THEIR TREATMENT, AND THE RIGHT TO REFUSE TREATMENT

5. VERIFY PATIENT DIET RESTRICTIONS/REQUIREMENTS FOR TEST/PATIENT INTERVIEW:

If fasting testing is required

Factors related to the physical or emotional disposition of the patient often have an impact on the blood collection process or the integrity of the specimen. If the phlebotomist is aware of them, he or she may be able to prepare more adequately for the venipuncture.

It is important the phlebotomists use professional judgment in asking or confirming issues related to disposition. These factors include:

- **DIET:** Many body substances are affected by the ingestion of foods and beverages. Some tests require the patient to fast and/or eliminate certain foods from the diet before the blood is drawn. Time and diet restrictions vary according to the test. Such restrictions are necessary to ensure accurate test results.

- **STRESS:** Excessively anxious or emotional patients may need extra time to calm down prior to, during, or after the procedure. The phlebotomist should be kindly aware of these emotional needs and know how to deal with them.

- **AGE:** Elderly patients may have more "difficult" or frail veins from which to choose the venipuncture site.

- **WEIGHT:** Obese patients may require special equipment, such as a large blood pressure cuff for the tourniquet or a longer needle to penetrate the vein.

6. EXPLAIN VENIPUNCTURE PROCEDURE TO PATIENT: Be honest; IT HURTS!

Try to gain the patient's confidence. Explain to the patient that blood is being collected for tests that have been ordered by their physician as part of routine protocol. During the collection, the phlebotomist should remain calm and inform the patient what he/she is doing at each step. For example, let the patient know that the tourniquet will be a little tight, or, before inserting the needle, let the patient know that there will be a stick. Patients should never be told, "This will not hurt". Assure the patient that, although the venipuncture may be slightly painful, it will be of short duration.

Upon completion of the collection, be sure to thank the patient for his/her cooperation.

It is important for the phlebotomist to remember that verbal and nonverbal cues (body language) play an important part in the communication of what the patient perceives and how he or she responds. In addition, listening skills are a valuable part of patient communication. A smile can help the patient feel more at ease and make him/her feel like he/she is the most important person at that particular moment. Eye contact is also a vital part of effective communication. Eye contact promotes a sense of trust and honesty between the patient and phlebotomist. Physical appearance communicates a great deal about an individual. Neatly styled hair, clean fingernails, pressed clothes and lab coat, pleasant breath and body odor instill confidence in a person and relay a sense of professionalism to the patient. Listening skills are another key to effective communication.

For most phlebotomy procedure to be successful the patient must participate and cooperate. The phlebotomist must be willing and able to provide sufficient, understandable instruction to the patient for the protocols to be accomplished. Information about the

procedure should be fully explained (especially if it is a first-time blood collection for the patient, or if it has been a long time since the last blood collection).

The Phlebotomist must take special care when drawing blood from patients unable to cooperate with the venipuncture procedure (pediatric, psychiatric patients, etc) to anticipate any unexpected movements or jerks either while introducing the needle, or while it is in place in the arm. A gauze pad should be readily available and the tourniquet quickly released in the event the needle is violently removed or repositioned. If the needle accidentally goes much deeper into the arm or the patient complaints about the procedure, the phlebotomist must inform the supervisor, the nurse or physician in charge, who will examine the area for possible damage.

The Phlebotomist must not proceed to draw blood against the patient's wishes. Instead report the patient's objections to the physician and your supervisor.

The Phlebotomist must assure that the puncture site has been appropriately cared for and that the patient is physically fit to leave the area after the phlebotomy procedure. The phlebotomist must assure that the patient is no longer bleeding, the puncture site has been appropriately bandaged (unless patient refuses or tells that he or she is allergic to the bandage), and that the patient is able to stay by him- or her.

7. DOCUMENT COLLECTION (Cerner specimen collection):

Obtain bar code labels, which indicate number of tubes and color top tube to be collected. Document specimen collection, if the request was entered in the hospital computerized system, place small computerized-glued label on the Phlebotomy Request form. Initial the label and form accordingly. If the order is received on a manual requisition when the system is down, document all information on the same form mentioned above.

Each phlebotomist is responsible to keep his or her phlebotomist service form and list up to date.
In cases, where the specimen collection was already documented, the phlebotomist actually doing the procedure must change the collector and document that he or she was the real specimen collector.

8. ASSEMBLE SUPPLIES REQUIRED/SELECT VACUTAINER TUBES AND INSPECT THEM:

Notify your supervisor immediately if deficiency is identified.
Prepare supply needed: gloves, blood-collecting tubes, needles, syringe or vacutainer holder, tourniquet, 70 percent isopropyl alcohol, gauze pads, bandage, grip and armrest.

Keep all supplies in sanitary condition and organized. All items must be kept labeled, cleaned and organized. Observe expiration date. Discard expired media immediately.

Daily inspection is needed to check for out-dated items. Inspect all items for imperfections. Notify supervisor immediately if defected material is found.

In addition of being prepared with the proper equipment and supplies, and safety precautions taken, the health care worker must be emotionally prepared. Such preparation involves adopting a professional appearance and behavior, as well as exercising good communication skills, both as a listener and as a speaker.

9. OBSERVE PATIENT'S ARMS/HANDS CONDITION:

Choose the best vein available. The most common sites for venipuncture are in the antecubital are of the arm, where the median cubital, cephalic, and basilic veins lie close to

the surface of the skin and are most prominent. Palpating this area usually helps the phlebotomist get an idea of the size, angle, and depth of the vein. It is important to remember that veins may also be used for transfusion, infusion, and therapeutic agents. Thus, sometimes veins have restricted use for those purposes.

Select site for venipuncture. Place tourniquet on arm and choose the vein, which feels fullest. Always choose a vein by the way it feels, not by the way it looks. The order of choosing a vein is as follows:

1. Median cubital: the largest and best anchored vein.
2. Cephalic
3. Basilic

Feel for the median cubital or cephalic veins first because they tend to be anchored better and are usually less painful and don't bruise as easy. Try to avoid veins that run either directly above or beside a tendon. This can be very painful to the patient and can cause numbness in the entire arm.

If at first you don't succeed, don't be afraid to look elsewhere for another vein. If a "good" vein cannot be found, try the following:

- Ask patient to make a fist but **"NO PUMPING".** Ask to hold the grip.
- Massage arm from elbow to wrist.
- Tapping sharply at the vein site with index and second finger a few times will cause the vein to dilate.
- Apply heat (warming device) to vein site (follow procedure in this manual).
- Lowering the extremity will allow the veins to fill to capacity.
- Many times, veins in the opposite arm will prove more suitable for venipuncture.

The dorsal side of the hand or wrist veins should be used only if arm veins have been determined unsuitable. **DO NOT USE THE ANKLE OR FOOT VEINS TO PERFORM THE PROCEDURE** to avoid coagulation and/or vascular complications, especially for diabetic patients. Notify supervisor immediately if unable to perform the procedure.

Reasons for not using the patient's arm veins include the following:

- Intravenous (IV) lines in both arms
- Burned or scarred areas
- Cast(s) on arm(s)
- Thromboses veins
- Edematous arms
- Partial or radical mastectomy on one side

For hand vein puncture, the posterior surface of the wrist is preferred. **DO NOT USE THE ANTERIOR SIDE OF THE PALMAR VENOUS NETWORK**, because nerves lie very close to the palmar venous network and can easily be injured by needle probing.

Veins in the wrist tend to move, or roll, aside as the needle is inserted; therefore, it may be helpful to have the patient extend the hand into a position that helps hold the vein taut.

Venipuncture in small veins is facilitated by the use of 21-to 25-gauge butterfly needle.

It is also important to know that arteries do not feel like veins. Arteries pulsate, are more elastic, and have a thick wall. Thromboses veins lack resilience, feel like a cord, and roll easily.

10. APPLY PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIRED: Gloves, etc.

A Lab coat and Gloves **MUST** be used during the phlebotomy procedure. Gloves must be changed between patients. After removal of the gloves, the phlebotomist must cleanse his/her hands by handwashing or the use of a hand sanitizer approved by the Infection Control Department.

Discard gloves according to procedure on this manual, after each phlebotomy procedure.

11. POSITION PATIENT'S ARM/HAND. REQUEST ASSISTANCE IF NECESSARY:

The patient should be seated comfortably in a chair and should position his or her arm on an armrest, extending the arm so as to form a relatively straight line from the shoulder to the wrist. The arm should be supported firmly by the armrest and should be only slightly bent at the elbow.

The phlebotomist can position him- or herself in front of the chair to protect the patient from falling forward in the event of fainting. A slight rotation of the patient's arm or hand may help expose a vein and prevent it from rolling as the needle is inserted. The visibility of the veins varies with each individual's skin color, weight, physiologic conditions, gender, and physical features. Therefore, the phlebotomist must rely on the sense of touch (palpation) to locate the vein.

Assistance should be requested from another phlebotomist, if necessary, before trying to perform the procedure. Give specific instructions to parent or guardian when dealing with pediatric or handicap patients.

12. ASK PATIENT TO CLOSE HAND: Phlebotomy grip available

Ask the patient to make a fist or hold the grip. This makes the veins more prominent and easier to enter. Vigorous hand exercise "pumping" should be avoided because it may affect some test values due to possible changes in the concentration of certain analytes in the blood.

The patient may be asked to clench and unclench the fist only a few times because excessive clenching also results in hem concentration. Patient **MUST NOT BE** allowed to "pump" the hand.

If no vein becomes apparent or pops up, the patient may be asked to dangle the arm for 1 to 2 minutes to allow blood to fill the veins to capacity, then the tourniquet may be reapplied and the area palpated again. The phlebotomist should never stick a vein unless it can be felt. It is better to defer the patient to someone else who can search for the vein than to take a blind chance.

13. SELECT VENIPUNCTURE SITE: Select best vein available

The most common sites for venipuncture are in the antecubital area of the arm, where the median cubital, cephalic, and basilic veins lie close to the surface of the skin and are most prominent. Palpating this area usually helps the phlebotomist get an idea of the size, angle, and depth of the vein. The patient can assist in the process by opening and closing the fist

tightly. The median cubital vein should be the first choice when selecting a vein because it is generally the largest and best-anchored vein. Other veins that are acceptable are the cephalic vein (second choice) and the basilic vein (third choice).

For hand vein punctures, the posterior surface of the wrist is preferred. **DO NOT** use the anterior side or the palmar venous network in the wrist, because nerves lie very close to the palmar venous network and can easily be injured by needle probing. Hands veins or the veins on the dorsal surface of the wrist are preferred over foot or ankle veins because coagulation and vascular complications tend to be more troublesome in the lower extremities, especially for diabetic patients.

14. CLEANSE VENIPUNCTURE SITE:

Once the site is selected, it should be decontaminated with a sterile alcohol swab (70% isopropanol). This prevents microbiological contamination of either the patient or the specimen. The phlebotomist should rub the site, working in concentric circles from the inside out. If the skin is particularly dirty, the process should be repeated. The phlebotomist should also decontaminate his or her own gloved finger if he or she intends to palpate the site again.

The decontaminated area should never be touched with any a sterile object. The alcohol should be allowed to dry (approximately 30 to 60 seconds) or should be wiped off with sterile gauze or cotton after the site is prepared. **DO NOT BLOW ON THE SITE** because doing so may recontaminate the site.

15. APPLY TOURNIQUET:

A tourniquet may be used to help find a site for venipuncture. The use of a tourniquet makes the veins more prominent and easier to puncture due to venous filling. A soft rubber tourniquet about 1 inch wide and 15 to 18 inches long is most comfortable. To apply it, the phlebotomist should stretch the ends around the patient's arm about 3 inches above the venipuncture area; both ends of the tourniquet can be held in one hand while the other hand tucks in a section next to the skin and makes a partial loop with the tourniquet. The tourniquet should be tight but not painful to the patient. It should not be placed over sores or burned skin, but it may be placed over a hospital gown sleeve or a piece of gauze. The partially looped tourniquet should allow for easy release by the phlebotomist during the venipuncture procedure. During the venipuncture, the phlebotomist should be able to release the tourniquet with one hand because the other hand will be holding the needle and tubes.

The tourniquet **should NOT be left on for more than 1 minute** because it becomes uncomfortable and increases blood concentration of large molecules, such as proteins, cells, and coagulation factors. The patient may be asked to clench and unclench the fist only a few times because excessive clenching also results in that. If no vein becomes apparent or "pops up", the patient may be asked to dangle the arm for 1 to 2 minutes to allow blood to fill the veins to capacity, then the tourniquet may be reapplied and the area palpated again. The phlebotomist should never stick a vein unless it can be felt. It is better to defer the patient to another phlebotomist who can search for the vein than to take a blind chance.

The tourniquet can be released immediately or after the blood has been collected, but before needle withdrawal. Remember not to keep the tourniquet on for more than 1 minute on the patient's arm.

Laboratory test results can be falsely elevated or decreased if the tourniquet pressure is too tight t is maintained too long. The pressure from the tourniquet causes biological analytes to leak from the tissue cells into the blood, or vice versa. For example, plasma cholesterol,

iron, lipid, protein, and potassium levels will be falsely elevated if the tourniquet pressure is too tight or prolonged. In addition, some enzyme levels can be falsely elevated or decreased because of tourniquet pressure that is too tight prolonged.

Discard tourniquet per patient per procedure.

16. INSPECT NEEDLE: Bevel always up

The gauge and length of a needle used on a syringe or a vacuum tube is selected according to the specific task. For example:

18 gauge needles are used for collecting donor units of blood, 21 and 22 gauge needles are used for collecting specimens for laboratory assays 21, 23, and 25-gauge butterfly needle are used in the collection of blood from patients who are difficult to stick by conventional methods (e.g., geriatric patients, cancer patients, pediatric patients)

The gauge number indicates the diameter of the needle; the smaller the gauge number, the larger the needle. The length of the needle depends on the depth of the vein to be punctured. Needles are usually available as either 1 or 1.5 inch.

Needles are sterilized and packaged by vendors in sealed shields that maintain sterility. The tip of each needle should be checked for damage. A blunt or bent tip can be harmful to the patient's vein and may result in failure to collect blood. Report to your supervisor of any damage or equipment defect.

NOTE: BUTTERFLY NEEDLES OR WINGED INFUSION SETS ACCOUNT FOR THE HIGHEST PERCENTAGE OF NEEDLE STICK INJURIES.

17. PERFORM VENIPUNCTURE:

Pay attention to procedure and patient. Refer to order of draw in the Procedure Manual.

Grasp the patient's arm firmly, using your thumb to draw the skin taut. This anchors the vein. The thumb should be one or two inches (2.5 cm or 5.0 cm) below the Venipuncture site. Make sure the patient's arm or other Venipuncture site is in a downward position to prevent reflux or "backflow". During the procedure, do not allow the contents of the tube to contact the stopper. Movement of the fluid back and forth in the tube can cause reflux of blood into the venous system and possible adverse patient reaction. The vein is entered with the bevel of the needle upward. The needle should be inserted and kept at a 15-30 °C angle between the needle insertion and the patient's arm during the procedure. One hand should hold the evacuated tube while the other depresses the tube to the end of the holder, as described above. The tube should be kept below the site when the needle is in the vein.

EVACUATED TUBE METHOD:

When using the evacuated tube (e.g., Vacutainer) system, the needle should be first threaded onto the holder; second, the test tube should be pushed carefully into the holder so that he test tube cap is punctured by the inside needle and blood can enter the evacuated tube. If multiple sample tubes are to be collected, each tube should be gently removed from the Vacutainer holder and replaced with another tube. Experienced phlebotomists are able to mix a full tube in one hand while holding the needle apparatus and waiting for another tube to fill. The dominant hand could be used to change tubes while the other hand keeps the needle apparatus steady. This approach may require switching hands after needle insertion. A position that is the most comfortable for the patient and the phlebotomist should be used while the needle is simultaneously kept as stable and motionless as possible during tube fillings. Always remember to release the tourniquet once blood begins to flow into the tubes. Multiple tubes can be filled in less than 1 minute if

the needle remains stable in the vein and the vein does not collapse. So that the proper dilution of blood and additive in the tube is ensured, each tube should be allowed to fill until the blood flow stops. Tubes do not fill completely, so the phlebotomist must be attentive to when the blood flow ceases. To change tubes, the phlebotomist should remove the full tube from the needle apparatus with a gentle twist-and-pull motion, and then replace it with an empty tube, using a gentle push onto the needle apparatus. During the tube exchange, the needle apparatus should be held firmly so that the needle remains in the vein and is not pushed through or pulled out of the vein. Release tourniquet as soon as the blood begins to flow, if possible.

Order of Draw for Multiple Tube Collections:

- Blood Cultures – SPS
- Citrate Tube
- BD Vacutainer – SST Gel Separator Tube
- Serum Tube *(Glass or plastic)*
- Heparin Tube
- BD Vacutainer – PST Gel Separator Tube With Heparin
- EDTA Tube
- Fluoride (glucose) Tube

The tube should be filled until the vacuum is exhausted and the blood flow ceases to ensure a correct ratio of anticoagulant to blood. After each tube is drawn, an additive should be mixed immediately by inverting the tube at least five times. Gentle inversion will prevent hemolysis. Never shake a tube of blood after collecting a blood specimen.

Occasionally, a faulty tube will have no vacuum. If a tube is not filling and the needle is inside the vein, another tube should be used. If a tube starts to fill but then stops, the needle should be moved slightly forward or backward. Usually, this adjustment will increase the blood flow. The needle can then be rotated half a turn, and the tourniquet, which may have been applied too tightly, is loosened. Probing is not recommended because it is painful to the patient. If none of these procedures is helpful, the needle should be removed and an alternative site should be used.

When all tubes have been filled, the needle should be carefully, but quickly withdrawn. If a safety device is being used, it should be activated as soon as the needle is removed from the Venipuncture site and then discarded.

Always, discard the Vacutainer tube holder per patient.

SYRINGE METHOD:

Syringe method of drawing venous blood is not recommended since it is much safer and easier to use a closed, evacuated tube system. In cases where a specimen from an individual with fragile vein needs to be drawn, a needle and syringe (or a winged blood collection set) may be used. The following procedure for a syringe draw should be performed:

- Get a syringe and move plunger back and forth to allow for free movement and to expel all air in syringe.

- Insert the appropriate needle onto the syringe.

- Follow the same procedure as described above for the Evacuated System is used.

- Follow "order of draw" syringe method, refer to chart in this manual.

- Rubber stoppers should not be removed from evacuated tubes to transfer blood to multiple tubes.

- To transfer blood from the syringe to an evacuated tube use a blood transfer device (refer to section procedure manual). If blood transfer device is not available, carefully remove the needle or the winged blood collection set, attach a larger sterile needle (18 gauge).

Order of Draw Using an Evacuated Tube System and Order of Transfer from a Syringe to Sample Tubes:

- Blood culture tube
- Plain tube, non-additive (e.g., black/red speckled stopper)
- Coagulation tube (e.g., blue stopper)
- Additive tubes:
    - Gel separator tube (e.g., black/red speckled stopper)
    - Heparin (e.g., green stopper)
    - EDTA (e.g., lavender stopper)
    - Other additive tubes (e.g., oxalate/fluoride gray stopper)

NOTE:

1. When transferring blood from a syringe to evacuated tubes, place the tube(s) in a tube holder or a rack. **Do NOT** hand-hold a tube while you are pushing the needle through the stopper. As soon as the needle has penetrated the stopper, it is fine to hold the tube in your hand. Alternatively, use a safety-syringe shielded transfer device.

2. **Do NOT** place any pressure on the syringe plunger when transferring blood from a syringe to evacuated tubes. The tube's vacuum will provide the negative pressure to pull the blood into the tube. Excess pressure may cause hemolysis.

3. The most current NCCLS standard states that if a coagulation tube is for APTT or PT only, the first tube drawn may be used for testing. However if special coagulation testing (e.g., Factor VIII) is being drawn, the second or third tube should be used. (A plain tube may be drawn and discarded of the special coagulation test are the only tests being drawn.)

- To avoid accidental needle stick, a single hand method must be used: "Vacutainer tube must not be held with the hand when inserting the needle (refer to the Needle Reheated and Tube Holder Chapter in this manual). Great care should be exercised when removing the needle. Always activate safety device after removing needle from Vacutainer tube.

- The stopper is pierce with the needle and the tube is allowed to fill (without applying any pressure to the plunger) until flow ceases. This technique helps to maintain the correct ratio of blood to additive if an additive tube is being used.

- Mix additive tubes by inversion.

A syringe and needle should be used to collect blood from patients with more difficult veins. If the puncture has been made and the blood is not flowing, determine whether you are

pulling too hard on the plunger and collapsing the vein. Once the needle is in the vein, the syringe plunger can be drawn back slowly until the required amount of blood is drawn. Make sure that the skin covers the bevel. It may be helpful to turn the syringe slightly so that the graduated markings are visible. With the syringe in the right hand, you can use the index finger of the left hand to feel for the vein. After the vein is relocated, keep your finger gently on the vein, and guide the needle to that point. Then, pull gently on the plunger. As soon as the blood starts to flow into the syringe, the needle should not be moved. Care must be taken not to accidentally withdraw the needle while pulling back on the plunger and not to pull hard enough to cause hemolysis (e.g., rupture of the cells) or collapse of the vein.

After tourniquet release and collection of the appropriate amount of blood, the entire needle assembly should be withdrawn quickly. Again, the safety device should be activated immediately, depending on the manufacturer's specifications. Refer to the section manual for specific procedure. Discard tourniquet, needle and Vacutainer tube holder per patient.

When collecting blood using a safety needle or butterfly needle system, after withdrawal of the needle from arm or hand, the safety or butterfly needle should be changed to a lower gauge needle (larger needle) before inoculation of vacutainer tubes, to avoid hemolysis of blood cells. Prompt action must be taken at this step to avoid coagulation of the blood. **REMEMBER** that the coagulation process starts immediately after the blood is withdrawn from patient.

BUTTERFLY OR WINGED INFUSION SET METHOD:

A winged infusion set with leur adapters can be used instead of a syringe and needle for very difficult veins. The winged collection set is a closed system. Blood flows from the vein, through the set directly into a Vacutainer tube. This type of method is useful for the following circumstances:

- Patients with small veins (hand)
- Pediatric patients
- Geriatric patients
- Patients having numerous needles sticks (i.e., cancer patients)
- Patients in restrictive positions (i.e., traction, severe arthritis)
- Patients who are severed burned
- Patients with fragile skin and veins

NOTE:

If all possibilities have been exhausted, and you have not successfully performed a venipuncture on a patient after two attempts, enlist the aid of a co-worker or a supervisor. Inform the nurse or physician caring for the patient that you have made two unsuccessful attempts to draw blood from the patient. Make a notation of the circumstances on the Phlebotomist Performance Sheet.

All patients with a vascular shunt, fistula, mastectomy or any other medical condition which may affect the test results or patient safety must be clearly identified so that the phlebotomist will not draw from that arm and take appropriate precaution. Furthermore, phlebotomist will not draw arterial specimens (i.e., blood gases), ammonia levels or blood cultures. No venipuncture will be performed on patients under 6-8 months of age as a general rule. Each patient will be evaluated according to the patient's individual characteristics and, test(s) ordered by the patient's physician. In some cases, for example, when a large volume of blood is needed to perform specific test, the venipuncture procedure will need to be performed. The phlebotomist must be sure that he or she is able to perform the procedure without compromising patient's safety. The skin procedure is recommended when small amount of blood is sufficient for the test indicated and when the patient has not started walking yet. Collection of blood from children may require the

assistance of nursing personnel, parent or guardian, or another phlebotomist. The phlebotomist must give specific and clear instructions to the person assisting in performing the procedure to avoid any injury and a successful venipuncture.

18. FILL TUBE (S) UNTIL VACUUM IS EXHAUSTED:

Do not pull out tube is vacuum is present. Always fill tube(s) until vacuum is exhausted and the blood flow ceases to ensure a correct ratio of anticoagulant to blood. This applies to all additive tubes. All additive tubes should be appropriately mixed as soon as they are filled up, following the manufacturer recommendation.

Occasionally a faulty tube will have no vacuum. If the tube is not filling, try moving the needle slightly forward or backward. If this does not help, try another tube. If blood still fails to flow into the tube, the needle should be removed and an alternate site used.

When using an evacuated tube method, the first tube to be drawn should a blue top tube and any other tube follow a red top needed. Whenever coagulation studies are ordered, at least one other tube should be collected before the blue top tube is filled.

When choosing to use a syringe, the order of blood delivery changes considerably. Remember that with a syringe the freshest blood is at the bottom with the needle, and any tissue fluid will be at top with the plunger of the syringe. Therefore, blue (coagulation) tubes and any other anticoagulant tubes should be filled first and any red top tube last.

19. ASK PATIENT TO OPEN HAND:

After the last sample is drawn and the blood flow ceases, remove the tube from the holder. The shutoff valve re-covers the point, stopping blood flow. Ask patient to open his or her hand.

20. RELEASE TOURNIQUET:

Always discard tourniquet per patient per procedure. Release tourniquet as soon as the blood begins to flow. In case of difficult veins keep the tourniquet on and release it as soon as the last tube is being filled. Remember that the tourniquet should NOT be longer than ONE (1) minute on patient's arm. Ask the patient to open his or her hand. Releasing the tourniquet allows for normal blood circulation and a reduction in the amount of bleeding at the venipuncture site.

21. PLACE GAUZE OVER NEEDLE AT VENIPUNCTURE SITE BEFORE WITHDRAWING NEEDLE:

Place a dry gauze pad over the needle. Apply slightly pressure over the Venipuncture site. Phlebotomist may ask patient to help holding down the gauze on procedure site while discarding items and/or labeling specimens.

22. REMOVE NEEDLE:

Immediately activate safety device (needle or butterfly). Gently remove needle slowly while keeping the bevel in an upward position. The Phlebotomist must exercise care not to scratch the patient's arm. The gauze pad should be held firmly for several minutes or until bleeding has ceased over the venipuncture site.

If the patient has a free hand, he or she may be asked to apply the pressure. The patient's arm may be kept straight, or elevated above the heart. Do not ask the patient to bend the arm at the elbow.

Activate safety device as soon as needle comes out of venipuncture site. Discard immediately.

23. APPLY BANDAGE ON VENIPUNCTURE SITE:

Be sure that there is no bleeding at the venipuncture site before applying the bandage. Apply bandage and instruct the patient to leave it on for at least 15 minutes. **DO NOT APPLY** bandage on pediatric patients (infants or young children) due to possible irritation and the potential of swallowing or aspirating a bandage. BE SURE BLEEDING STOPS BEFORE PATIENT LEAVES AREA. Always observe venipuncture site before discharging patient; if a hematoma is observed, document the incident and notify supervisor immediately.

Excess Bleeding: If bleeding persists longer than five minutes, a nurse should be alerted so that the attending physician can be notified. Pressure must continue at the site as long as necessary to stop the bleeding. Documentation of event must be entered on the Incident Report Log.

24. DISCARD USED ITEMS ACCORDINGLY: "Sharps" containers, red plastic and clear plastic bags.
Dispose of needles promptly in a puncture-resistant container after activation of safety device to prevent their reuse or accidental injury. Needles should not be reheated, bent, broken, or cut. When collecting blood samples with a syringe, activate safety needle mechanism after specimen collection, unthread needle from syringe and discard into a sharp container. Attach syringe to the blood transfer device.

All disposable or contaminated equipment should be discarded into appropriate containers, as follows:

GROSSLY CONTAMINATED/BLOODY RED PLASTIC BAG (biohazardous) ONE RED PLASTIC BAG in the Phlebotomy area. NON-BLOODY (Gloves, paper, band aids, boxes, garbage in general) CLEAR PLASTIC BAG (wastebasket) ONE CLEAR BAG CONTAINER PER PHLEBOTOMIST ONE LARGE CONTAINER PER ROOM.

25. LABEL SPECIMEN (S): Use computerized bar code labels, hand written labels.

All tubes must be appropriately mixed and labeled after specimen collection and before patient leaves area. Take bar code label(s) and place on collected Vacutainer tubes. Match test requested with tube collected. If manual requisition is received, place hand written label on tube with the following information: patient's medical record number, patient's first and last names, date, time of collection and phlebotomist's initials. BLOOD BANK SPECIMENS: Phlebotomist MUST write their initials and date of collection on ALL labels (each tube).

26. FOLLOW SPECIMEN TRANSPORTATION REQUIREMENTS: (Icing, timing of specimen to reach the lab, STAT specimens, special request, etc.)

Priorities must be taken in consideration concerning the order in which certain blood tests are drawn on a particular patient and the need of this sample to reach the laboratory in a timely fashion. Special attention must be taken in consideration when special condition must be met for specific test(s).

The hospital messenger service must be called to transport specimens that require immediate processing, if necessary the phlebotomist will deliver specimen to the central receiving area (e.g., chilled specimens: Gastrin, Ammonia Lactic Acid, etc, timed specimens, etc).

27. ELIMINATE DIET RESTRICTION ACCORDINGLY IF PERMISSIBLE:

If patient was fasting to be tested, after blood collection, eliminate all restrictions required for sample collected.

28. PLACE SPECIMEN (S) IN SPECIMEN BOX FOR PICK UP BY THE MESSENGER SERVICE OR send specimen DIRECTLY VIA THE PNEUMATIC TRANSPORT SYSTEM IMMEDIATELY AFTER COLLECTION

- All specimens must be transported in a leak proof plastic bag with two compartments.
- All documents/labels with related information must be inserted in the bag outside compartment, if necessary.
- OPD Phlebotomy area: After specimen collection and labeling, tubes are put in a specimen bag sent via pneumatic tube, messenger, or deliver by the phlebotomy staff to central receiving for Stat or fast processing.

NOTE: Chill the specimen if necessary. Some tests require that blood specimens be cooled immediately following the venipuncture to slow down metabolic processes, which may alter some chemical values. Examples of common tests requiring chilling the specimen are:

- GASTRIN
- AMMONIA
- LACTIC ACID
- CATECHOLAMINES
- pH/BLOOD GASES
- PARATHYROID HORMONE (PTH)

29. REMOVE GLOVES:

Discard gloves per procedure per patient.
Discard grossly contaminated/bloody gloves in a “red plastic bag”. Gloves that are cleaned (not bloody) should be discarded in a “clear plastic bag” together with regular garbage.

30. COLLECTION LIST OR REQUEST MUST BE INITIAL AND PLACE THE CORRESPONDING NURSING STATION:

Place one of the small Cerner labels on the Phlebotomist List or request form. Each phlebotomist is responsible for completing this document.

31. WASH HANDS:

Must wash hands between patients and every time after changing gloves.
Wash hand after gloves are removed, between patient contacts, after touching blood/bloody fluids, before/after procedures, etc. Follow hand-washing procedures as stated in the section procedure manual that apply to specific working areas.

32. REORGANIZED/CLEAN WORKING AREA. GET READY FOR NEXT PATIENT:

All supplies and equipment used must be discarded appropriately, before calling the next patient. Replace items at end of shift to be ready for the following day. Phlebotomist should thank the patient before leaving.

VENIPUNCTURE IN CHILDREN

If the performance of a Venipuncture procedure is necessary on a child younger than two years of age, the site should be limited to superficial veins (i.e., the femoral vein is NOT recommended). Follow the same procedure described above. Children under 6 months of age should be evaluated to decide what procedure should be use: Venipuncture or skinpuncture. Also, the number of test requested and the amount of blood needed must be taken in consideration on this evaluation.

TIPS FOR SUCCESSFUL PEDIATRIC VENIPUNCTURE:

- It is recommended that pediatric venipuncture be done in teams of two.
- A good hold and holder is the most important thing to remember when drawing a child. The best holding technique is to have your partner hold one hand under the child's extended elbow and the other hand applying slight pressure on the radius across the child's wrist with the palm facing upward. It may be necessary to brace the arm with a rolled up towel. This technique will restrict any twisting movement of the child's arm.
- Gain the confident of your patient. Explain exactly what you will be doing to the patient, maintain eye contact, speak softly and reassure the patient.
- Never tell the child or let the parent tell the child that this will not hurt.
- if the child is uncooperative in any way, have the child lie down and get assistance.
- Have your equipment ready to proceed as quickly as possible.
- Tie the tourniquet on the child's gown sleeve so the skin will not be pinched.
- Watch for kicking feet or swinging of the free arm.
- Use of a butterfly on a pediatric patient works well since the extra tubing allows freedom for movement once the needle is inserted.
- Always allow the child know you are ready to stick. Sometimes asking the child to count works well.
- Know the amount of blood you need so that additional punctures will not be necessary. It is recommended that no more than 1 mL of blood per pound of body weight is drawn per 24 hours.
- Be cautious about the use of band aids as children have been known to pull them off and put them into their mouths; tape provides more pressure on the site, so it may be necessary to apply a band aid **over** the tape.
- Stickers serve as good rewards.
- Be aware that a crying child will upset the parent. You need to communicate and reassure the parent as well as the child.
- Good pediatric phlebotomy takes practice; share experiences and knowledge with others.
- Heel punctures should be performed on infants less than 12 months old, as a general rule. Certain factors like: infant walking at an earlier age, amount of blood needed for

testing, good developed veins, etc could favor the performance of a Venipuncture. The expertise of the phlebotomist performing the procedure must be considered also.

VI. ATTACHMENT:

None

VII. REFERENCE:

NCCLS, H3-A4, Vol. 18 No. 7, Procedures for the Collection of Diagnostic Blood Specimen by Venipuncture; Approved Standard-Fourth Edition, June 1998.

Garza, D. & Becan-McBride, K., Phlebotomy Handbook: Blood Collection Essentials, fifth edition, Appleton & Lange, Ct, 1999.

Date Reviewed	Revision Required		Responsible Staff Name and Title
	Yes	No	
	Yes	No	