

Venipuncture

SCOPE: This procedure applies to laboratory and non-laboratory associates that collect blood specimens.

OBJECTIVE:

Proper blood collection technique is essential to obtaining accurate test results. Some laboratory errors can be traced to factors in the collection and handling of the specimen.

Proper infection control procedures are imperative to protect both the laboratory associate and the patient. The hospital policy on Standard Precautions is followed and may be used as a reference for specific infection control precautions

CORE VALUES and ETHICAL RELIGIOUS DIRECTIVES:

While all CSRHS policies and procedures reflect CHRISTUS Health's Core Values and its mission "to extend the healing ministry of Jesus Christ", this Procedure primarily addresses the Core Values of Excellence and Stewardship as it outlines expectations related to appropriate laboratory practices.

With regards to the ERDs for Catholic Health Care Services, CHRISTUS Santa Rosa affirms the organization's commitment to health care ministry and upholds the organization's distinctive Catholic identity. This procedure has been reviewed for ERD applicability. As this procedure addresses the standardized process and expectations for laboratory testing, it directly impacts the obligation to maintain professional standards and adhere to the ERDs.

1.0 GUIDELINES/ SPECIAL INSTRUCTIONS

- 1.1** Wash your hands before and after each specimen collection; alcohol based waterless hand wash can be used.
- 1.2** Always wear disposable (non-latex or powder free latex) gloves when performing a venipuncture, capillary puncture, or working with blood or body fluid specimens.
- 1.3** Obtain specimens only from patient's (both inpatients and outpatients) who have been positively identified by two separate identifiers. The patient name and account number are the standard identifiers used by the laboratory before drawing blood.
- 1.4** Venipuncture by the laboratory personnel is limited to the upper extremities, unless the physician specifically approves another location.
- 1.5** Venipuncture may not be performed above an IV site or in an arm with a heparin lock, shunt, or bovine graft.
- 1.6** Venipuncture may not be performed on the same side as a recent mastectomy.

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- 1.7** Only two attempts by one person are allowed. After two unsuccessful attempts, the nurse must be notified, and another phlebotomist is summoned. If the second phlebotomist is unsuccessful, a capillary puncture will be performed, if possible, for requested tests. If still unable to obtain blood, the nurse responsible for the patient will be notified. Respiratory care may be requested to perform an arterial puncture for the specimen upon physician order.
- 1.8** Patients may not be forced to have blood drawn. If a patient refuses, the patient's nurse is notified. Please refer to the Patient's Bill of Rights.
- 1.9** ISOLATION precautions must be followed as prescribed when posted.
- 1.10** Standard precautions are followed. All specimens are treated as if capable of transmitting infectious disease. Needles and lancets are disposed of appropriately in approved sharps containers with biohazard labels.
- 1.11** If a blood spill occurs, disinfect the area with 10% bleach solution or an approved hospital disinfectant.
- 1.12** Every effort is made to draw the minimum amount of blood required for testing. Specimen requirements are available in the LIS and in the NB/CE Test Dictionaries.
- 1.13** New tests become available continually, and any listing may not contain all tests. Prior to drawing the specimen for any test, the phlebotomist is responsible for researching the appropriate specimen type and volume. If the information is not available, techs involved in referred testing are consulted to research the test prior to collection. Manufacturer's (instrument and/or reagent/methodology) recommendations are followed for specimen requirements for tests to avoid analytical interferences.

2.0 SUPPLIES: Each phlebotomy tray may be stocked with various vacuum tubes, single use BioPlexus holder (hub), single-use Blood Culture holders, needles (BioPlexus Puncture-Guard multi-draw safety needles (21G, 22G) and 23G BD Safety Glide syringe needles), syringes (5, and 10mL), transfer devices, Tourniquet (non-latex), alcohol preps, betadine, sharps disposal container, lancets, sterile 2X2 gauze), microtainers, Band-Aids, paper tape, and blood culture bottles, as needed. (Phlebotomist must ensure all supplies are not expired before use).

3.0 NEEDLES

- 3.1** The needle size is referred to as the needle gauge. The gauge is a measurement of the diameter of the needle; the larger the gauge number, the smaller the diameter of the needle.
- 3.2** Blood drawn for laboratory testing is normally drawn with a 21G or 22G needle. In instances where veins are fragile and/or positioning of the patient is difficult, a 23G safety needle and syringe or a 23G safety butterfly may be used.

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4.0 PROCEDURE

4.1 Selection of Blood Collection Site. Before collecting blood specimens from patients, select an appropriate collection site.

4.1.1 Laboratory personnel will collect blood only from an upper extremity.

4.1.2 Laboratory personnel will collect only venous or capillary blood from the patient.

4.1.3 Do not select a collection site on an arm labeled "Restricted." This label is usually used on surgical patients (i.e. mastectomy, lumpectomy...)

4.1.4 If the patient has an intravenous line (IV):

4.1.4.1 Laboratory personnel will request the IV pump be stopped by the patient's nurse.

4.1.4.2 Ensure the IV infusion has been turned off for a minimum of 2 minutes before proceeding to blood collection.

4.1.4.3 Select a blood collection site that is below the IV site.

4.1.4.4 If there are no available sites below the IV site, proceed to blood collection and discard the first 10mL of blood collected.

4.1.4.5 The laboratory personnel will notate on the patient labels if the specimen was drawn above the IV site.

4.2 Venipuncture by multi-draw system:

4.2.1 Check patient identification. Two patient identifiers must be verified. The patient account number and the patient name are checked on the patient armband after verifying the integrity of the armband by a verification of the patient name or birthday. The patient may be asked for this information or a family member with the patient. The complete patient name and Account number on the collection list/requisition is cross-checked against the patient's ID bracelet. Patients must have a CHRISTUS Santa Rosa ID band on their arm. ID bracelets attached to the bed, bedside, or chart are not valid. Notify nursing personnel if a bracelet is missing and request that an ID band is attached to the patient before the specimen is drawn. The patient may NOT be drawn without an ID bracelet.

4.2.2 Select the proper specimen collection tubes and appropriate gauge needle. All equipment and supplies needed for the venipuncture must be assembled before attempting the venipuncture. A syringe, or safety butterfly and syringe may be used to collect blood from veins that may collapse when using an evacuated tube system (e.g. small or fragile veins often found in elderly patients or patient's undergoing chemotherapy). Use of a syringe allows the phlebotomist to control the amount of vacuum placed on the vein.

4.2.3 If a syringe is being used, a transfer device should be used to safely transfer the blood from the syringe to the evacuated tubes.

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- 4.2.4** After gathering supplies, put on gloves and choose the optimum venipuncture site. Apply the tourniquet around the arm at least 3-4 inches above the possible venipuncture site. Have the patient make a fist if possible to enlarge the veins. Generally, the veins in the antecubital area are the best veins for venipuncture. Palpate for the vein by pushing lightly on the skin with increasing pressure using the index finger. Vein will feel spongy, resilient and have a tube-like curvature. Veins on the underside of the wrist should not be considered. Arteries should not be used for blood collection and can be identified by feeling the pulsating of the blood in the artery.
- 4.2.5** Blood flow should not be stopped for more than one minute before blood is drawn. In case of difficulty or delay, loosen the tourniquet for a minute or so before reattaching and proceeding with the venipuncture.
- 4.2.6** Clean the venipuncture site thoroughly with alcohol prep. (Except in the case of blood alcohol is ordered, where a preparation pad containing Povidone-Iodine will be used for cleansing the site.) Use as many pads as needed to observe no residual dirt on the pad before venipuncture. Dry the site using sterile gauze. Residual alcohol causes rapid hemolysis and a burning sensation when the venipuncture is performed.
- 4.2.7** Make sure that all collection supplies and extra tubes are within the arm's reach prior to beginning the venipuncture, but do not place the phlebotomy tray on the patient's bed.
- 4.2.8** When using vacutainer tubes for collection, avoid allowing the contents of the tube to contact the stopper in order to avoid possible back flow from the tube. When multiple specimens from a single venipuncture are drawn, they must be collected in the following order to avoid contamination and anticoagulant crossover:
- 4.2.8.1** Sterile specimens (Blood cultures)
 - 4.2.8.2** Citrate tubes (light blue top)
 - 4.2.8.3** Non-additive tubes or tubes with clot activator (red top)
 - 4.2.8.4** Heparinized tubes (green or dark blue top)
 - 4.2.8.5** EDTA (lavender top)
 - 4.2.8.6** Glycolytic inhibitor tubes (gray top)
- 4.2.9** The Puncture-guard needle is attached securely to the regular BioPlexus holder and the cap is removed. Stretch the skin by pulling downward on the arm from below the intended venipuncture site to anchor the vein and minimize the pain of the puncture. The needle is inserted into the vein with the bevel up. The first collection tube is inserted into the holder until it is even with the frosted band on the holder. A resistance will be felt at this point and the blood flow should begin. If no blood flow is seen, you may gently reposition the needle (deeper into the vein, pulling back if you think you

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passed through the vein, or slightly change the direction to find the vein) until the blood flow is obtained.

- 4.2.10 Once the needle is in the vein and the blood flow begins, release the skin and remove the tourniquet. Fill the Vacutainer tubes sequentially as directed in step 8, inverting each tube gently to mix as it is removed from the holder. When the last tube is filling, the safety feature of the needle is activated. While holding the holder assembly stationary, advance the tube forward into the frosted band of the needle holder assembly. You will hear an audible “click” indicating that the blunt cannula tip of the needle had been advanced and locked into place.
- 4.2.11 If the need arises, the safety mechanism can be engaged any time during the venipuncture. The blood flow will continue and the tubes can be filled. If the safety mechanism has been activated, **YOU MAY NOT REPOSITION THE NEEDLE** if the blood flow is lost. The needle must be removed and a second venipuncture must be performed to complete the collection.
- 4.2.12 When sampling is almost complete, remove the last tube from the holder before the needle is withdrawn from the vein. Remove the needle/holder assembly from the patient’s arm and immediately apply pressure with the gauze over the venipuncture site. Continue to apply pressure to the site until bleeding stops. Do not request the patient to bend their arm to hold the gauze, as this does not apply appropriate pressure on the site. Verify that the bleeding has stopped before leaving the patient. Apply a bandage over the area. For latex sensitive patients, apply paper tape over the gauze on the venipuncture site. Instruct the patient to leave the bandage in place for at least 15 minutes.
- 4.2.13 Do not remove the needle from the holder, but dispose of the complete unit in the wall mounted sharps container in the patient room or in the sharps container on the phlebotomy tray. Do not recap needle unless specifically required by the procedure and then only with an approved safety device. The safety cover of the Protex syringe needle is activated by pressing the orange shield against a hard surface to cover the needle. The syringe with covered needle attached should be discarded in the wall mounted sharps container in the patient’s room, following the instructions on the containers. When safety butterflies are used, a one-handed technique is used to move the shield forward to cover the needle immediately after withdrawing the needle from the vein. The shielded butterfly with holder attached is disposed of in the sharps container.
- 4.2.14 Dispose of any other material in the patient’s trash can. Gauze with small stains of blood does not need to be disposed of in special waste containers. Verify that all trash is disposed of before leaving the patient’s room.

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- 4.2.15 Properly label all tubes at the patient's bedside, with patient's name (if no computer labels are available) or attach the proper Mediatech specimen label to each tube before leaving the patient's bedside.
- 4.2.16 The collection list is initialed and the time of collection is recorded at the time of the venipuncture and before leaving the patient room.

4.3 Venipuncture by Syringe:

- 4.3.1 A syringe may be used when it is important to control or reduce the amount of vacuum on fragile vein during collection.
- 4.3.2 Prepare the venipuncture site as indicated above. Loosen the plunger of the syringe prior to beginning the venipuncture and expel all air from the syringe. Attach the appropriate safety needle (23 gauge is commonly used on small veins) to the appropriate sized syringe (based on the amount of blood required). Remove the needle cap with a straightforward motion to avoid loosening the needle from the syringe. Insert the needle bevel up into the vein. While stabilizing the syringe with one hand, begin to pull back on the plunger wings with the fingers of other hand. A flash of blood may be seen in the hub of the syringe when the vein is accessed. Remove the tourniquet when blood flow begins. Continue to pull back on the plunger slowly until the needed volume of blood is collected.
- 4.3.3 After removing the needle from the vein when the collection is complete, activate the safety shield of the needle by pressing the shield side of the needle against a hard stable surface. When the shield is in place, remove the needle from the syringe and discard into a sharps container.
- 4.3.4 Attach a transfer device to the syringe containing the blood. Insert the Vacutainer tubes into the holder side of the transfer device in the same order as indicated in step #9 and allow the tube vacuum to fill the tubes. When the tubes are filled, discard the syringe with the transfer device attached into the wall mounted sharps container in the patient room or in a sharps container on the phlebotomy tray.

4.4 Venipuncture by Winged Collection Set:

- 4.4.1 A winged collection set may be used when reduced vacuum may be helpful in collecting from a small vein. The winged collection set is removed from the package and the tubing is stretched before proceeding. The collection set is attached to a BioPlexus holder.
- 4.4.2 The venipuncture site is prepared as indicated above. The wings of the collection set are squeezed between the thumb and index finger and the needle is inserted with the

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bevel up. A flash of blood may be seen when the needle is in the vein. The vacutainer is inserted into the holder and will begin to fill.

- 4.4.3** When all tubes have been collected, remove the last tube from the holder. Remove the needle from the vein and apply pressure as indicated in step #12. While holding the collection set at the base of the needle, push the shield over the needle with the thumb using a one-handed technique. When the safety shield is completely covering the needle, discard the complete collection set with holder attached into the wall mounted sharps container.

4.5 For all Venipuncture Collection Methods:

- 4.5.1** During venipuncture do not have the patient clench and unclench the fist repeatedly. This will cause a shift in fluid between the vein and the surrounding tissue.
- 4.5.2** Do not leave the tourniquet on the arm for more than two minutes without releasing it. This can cause discomfort to the patient and may also cause hemoconcentration.
- 4.5.3** Properly label all tubes at the patient's bedside, with patient's name (if no computer labels are available) or attach the proper Meditech specimen label to each tube before leaving the patient's bedside.
- 4.5.4** The time of collection is recorded at the time of the venipuncture and before leaving the patient room.
- 4.5.5** Return to the laboratory with specimen and receive in the LIS, using the collection icon, receive by specimen routine.
- 4.5.6** Distribute specimens to the appropriate sections for testing.

5.0 COMPLICATIONS

- 5.1** Hematoma—A hematoma is caused when the needle is improperly placed in the vein, allowing blood to escape from the vein and collect under the skin. If a Hematoma begins to form during the venipuncture, the tourniquet should be released immediately, the needle withdrawn, and firm local pressure applied.
- 5.2** Rolling Veins—"Rolling veins" may be stabilized by firmly stretching the skin and pressing downward with the thumb, before performing the venipuncture.
- 5.3** Syncope—Syncope more commonly referred to as fainting, results from insufficient blood flow to the brain. Fainting during blood collection is primarily due to psychological causes, i.e. the sight of blood or needles. If a patient faints during phlebotomy, discontinue the procedure, support the patient, call for help and never leave the patient (this same procedure should be followed if a patient faints after phlebotomy). If a patient feels faint or faints before phlebotomy while sitting in a chair put the patient's head down between their knees. Once the patient recovers, suggest he/she lie down for the phlebotomy to be performed.

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- 5.4** **Petechiae**—Petechiae are small red dots that appear on the skin as a result of capillary hemorrhage. If petechiae are noticed, it may take a little longer than normal for the patient to stop bleeding from the venipuncture site. Petechiae may be the result of tying the tourniquet too tight or leaving it on for too long. For this reason, the tourniquet should not be on for longer than one minute.
- 5.5** **Edema**—Edema results when excessive fluids collect in the tissues of a patient, resulting in swelling. Venipuncture should be avoided in these areas, because it is often difficult to locate a vein, and the specimen may be diluted with tissue fluid, which could adversely affect the testing results.
- 5.6** **Obesity**—Locating or palpating a vein may be difficult in an obese patient, as veins are generally “deeper” and are not visible.
- 5.7** **Allergies**—Occasionally, patients may indicate that they are allergic to alcohol, betadine, adhesive bandage, or latex. Select an appropriate alternative cleanser after consultation with the nurse. Non latex gloves and tourniquet should be available on the phlebotomist’s tray at all times for use with latex sensitive patients. Paper tape and gauze should be used as an alternative to latex containing bandages.
- 5.8** **Scar Tissue**—Damaged or scarred veins are occasionally encountered in IV drug abusers or patients that have had numerous venipunctures. Attempts should be made to avoid the scarred area and locate alternative sites.
- 5.9** **Burns**—Burned areas must be avoided, as they are very susceptible to infection.
- 5.10** **Convulsions**—Convulsions resulting from phlebotomy are rare and generally caused by simple hysteria. The most important thing is to not let the patient harm himself or herself. If the needle is in the arm, release the tourniquet, and quickly remove the needle. Summon help and never leave the patient alone.

8.0 REFERENCES

- 8.1 Flynn, John, Procedures in Phlebotomy, W.B. Saunders Co., 1994.
- 8.2 The Center for Phlebotomy Education’s Venipuncture Tutorial.
- 8.3 NCCLS Guideline for Clinical Laboratory Procedure Manuals, H3-A5, 2003.
- 8.4 BioPlexus Punctur-Guard® training materials and product insert.

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