Venous Blood Collection

Purpose

This procedure provides instructions for VENOUS BLOOD COLLECTION.

Policy Statements

- This procedure is intended to help staff to have proper venous specimen collection and specimen handling technique. Good venipuncture technique is an art that causes only slight discomfort to the patient. With good techniques and a sharp needle, the same vein may be used for scores of venipunctures without damage to the vein. When proper techniques for blood specimen collection are followed, the risks of preanalytic errors and injury to patients and/or employees are reduced.

- This procedure applies to all laboratory staff who perform phlebotomy.

Materials

Supplies and Equipment	
70% isopropyl alcohol prep pads (CHC# 718)	Antimicrobial IV Sponge 2x2 (CHC# 1651)
Prevantics® [Chlorhexidine Gluconate (3.15%) and Isopropyl Alcohol (70%) Swab] Antiseptic (CHC# 20367)	Safety winged collection sets (butterflies) of various gauges
Swabsticks®, Povidone-Iodine Antiseptic 10% (CHC# 268)	Sterile syringes of various sizes
Blood Culture Prep Kit II, Cat. No. 260307	Safety transfer devices
Gauze pads, 2 X 2 (CHC# 128)	Collection tubes of various types and sizes
Latex-free bandages or tape	Single-use tube holder adapters
Latex-free gloves	Other personal protective equipment, as required
Latex-free disposable tourniquets	Sunquest® Collection Manager with stylus
Sharps container	Zebra QL 220 plus printers and labels
Safety needles of various lengths and gauges	Biohazard transport bag
Single-use tube holder adapters	3M® Kind Removal Blue Silicone Tape (CHC# 25998)

Note:

- **Ensure the integrity and quality of all supplies and equipment before use. Items dropped on the floor should not be used on a patient even if sterility has not been compromised, due to the perception of contamination by the patient or family.**

Sample

This procedure applies to all venous blood collections.

Special Safety Precautions

Authorized personnel should perform blood sampling.
Always handle blood samples and capillaries with care.
Avoid direct contact with the sample by using certified protective gloves.
Do not re-use sampling devices.

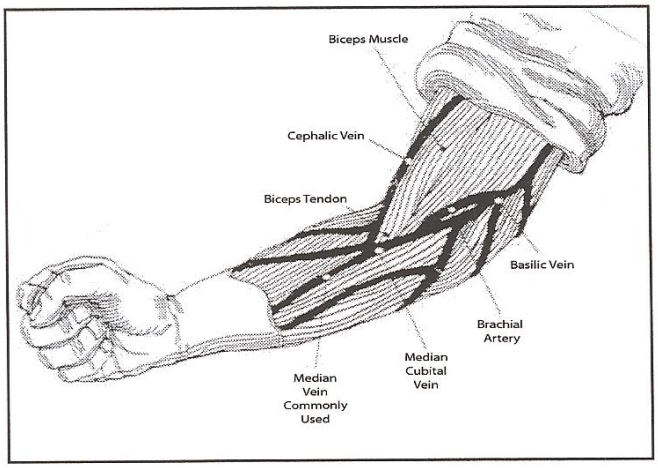
Procedure

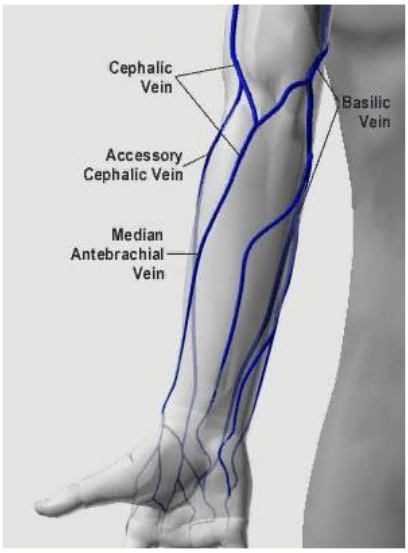
Follow the activities in the table below for VENOUS BLOOD COLLECTION.

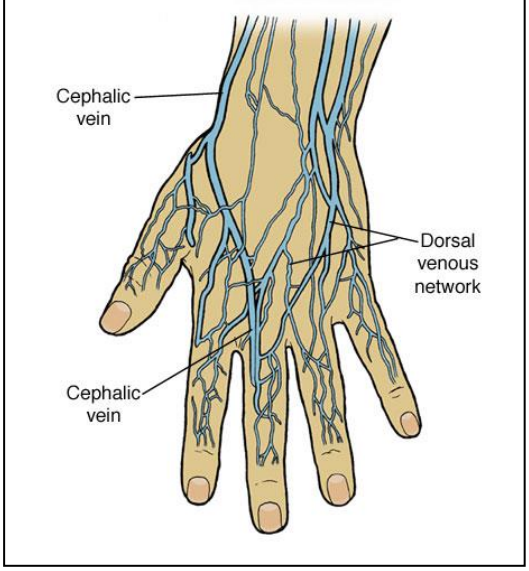
Step	Action	
1	Perform hand hygiene upon entering the patient's room. Refer to *Children's Policy 1201.08 Hand Hygiene, Fingernails and Jewelry for Infection Prevention and Control*	
2	Exercise Standard Precautions. Don gloves. If the patient is in isolation, refer to the following policies: *Children's Policy 1201.01 Standard Precautions for Infection Prevention and Control* *Children's Policy 1201.02 Airborne (Transmission-Based) Precautions* *Children's Policy 1201.03 Droplet (Transmission-based) Precautions* *Children's Policy 1201.04 Contact (Transmission-based) Precautions* *Children's Policy 1201.05 Empiric Use of Transmission-Based Precautions* *Children's 1201.05 Appendix I Isolation Precautions by Disease or Symptom*	
3	Identify the patient by scanning the patient's identification (ID) band with a Sunquest® collection manager device or Clinical Collect. During downtime match the patient's ID band with the Sunquest® test request or label using at least two patient identifiers (ie. full legal name, date of birth or medical record number). Resolve all discrepancies in patient identification prior to collection. Proceed with sample collection only when patient identification is properly verified. Refer to laboratory policy *SCM 1.20 Patient Identification – Specimen Collection* and Children's policies *376.00 Patient Identification Bands and Allergy Alerts* and *958.00 Latex Safe Precautions*.	
5	The venipuncture procedure is complex and requires both knowledge and skill. Vacutainer adapted set-ups and straight needles are typically used for older children or adults with firm, healthy veins. The decision is at the discretion of the phlebotomist.	
6	Verify test request and assemble supplies and equipment within reach. Look up any unfamiliar tests and verify necessary volumes, tube types and special handling.	
Position the patient		
1	Utilize age appropriate Comfort Promise techniques. Refer to *SCM 1.11.a1 Children's Comfort Promise*.	
2	**If**	**Then**
	• drawing the patient in a seated position	• ask the patient to sit in a chair with arms to ensure support and prevent falls, should the patient lose consciousness. Have the patient position his/her arm on the armrest.
	• drawing the patient in a reclining position	• ask the patient to lie on his/her back. Place a pillow under the patient's arm if additional support is needed.
	Have the patient extend his/her arm, forming a straight line from the shoulder to the wrist.	
Site Selection		
1	Evaluate the patient.	
	If the patient	**Then**
	• requires restraint	• Consider drawing from a site that is easier to immobilize. With the antecubital area in the joint of the arm, it may be difficult to stabilize. • Do not hesitate to ask for help from nursing unit if the patient requires restraining.

	• exhibits edema	• avoid drawing from an arm with edema. Swelling makes locating veins more difficult, can prolong healing and closure of the puncture site, and result in specimen contamination with tissue fluids.
	• has had a prior mastectomy	• do not collect the sample from the arm on the same side as the mastectomy. Punctures to the arm on the same side are not permitted without physician approval because the blood collected will contain higher levels of lymphocytes and waste products. It also places the patient at risk for long-term pain and infection.
	• has injuries to the arm (i.e., burns, scars, infection, inflammation, etc.)	• avoid draws from the affected arm. Select an alternative site.
	• is unable to hyperextend the arm (i.e., stroke patients)	• avoid draws from the affected arm. Select an alternative site.
	• lacks veins that are visible and/or palpable in either antecubital area	• select an alternative site.
	• is receiving IV fluids	• avoid draws from the same arm being infused, if possible. • Optimally, specimens should not be drawn from a site with an intravenous line (IV). If no other options exist, choose a site BELOW (distal to) the IV site. • As a last resort, ask a caregiver to turn off the IV for at least two minutes before venipuncture ABOVE (proximal to) an IV site that is below the antecubital fossa.
	• has a fistula	• do not draw from the affected arm. Select an alternative site.
	• has an indwelling line, lock or VAD (vascular access device)	• lab staff should never draw from an indwelling line, lock or VAD.
If any of these conditions preclude the use of the antecubital area, an alternative site should be considered such as the dorsal side (back) of the hand or the later (thumb) side of the wrist. The anterior (palm) side of the wrist should not be considered due to the close proximity of nerves and tendons to the skin's surface. Feet and ankle vein may be attempted with the care giver's permission. When venous access is not readily available, skin puncture is recommended as an alternative collection method, where appropriate.		
Vein Selection		

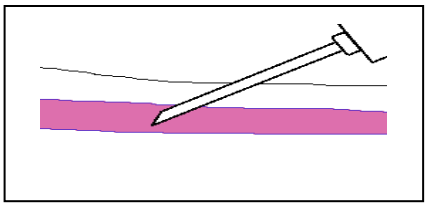
1	A patient's life may depend on vein patency. It is important to select the vein site carefully because veins provide an avenue of entry for transfusion, infusion, and therapeutic agents. Although the larger and full median cubital and cephalic veins are used most frequently, wrist and hand veins are also acceptable for venipuncture. Generally, the median veins are the veins of choice because they are: • Typically the closest to the skin's surface; • The most stationary, making a successful puncture more probable; • Less painful to the patient; • Associated with the least degree of risk to underlying structures.







	Apply the tourniquet 3-4 inches above the bend of the arm. Ensure that the tourniquet does not roll up, but remains flat against the circumference of the arm. Create a loop in the tourniquet to provide for an easy one-handed release. If the patient has a skin problem apply the tourniquet over the patient's clothing or gauze so that the skin is not pinched.	
2	Instruct the patient to make a fist but discourage hand pumping as it can elevate some analytes.	
3	Identify the most prominent of acceptable veins in the antecubital area (median, cephalic and basilic) visually and by palpation. Attempt to locate the median veins first.	
4	**If**	**Then**
	• a median vein or cephalic vein cannot be located	• consider the basilic vein only when no other vein is more prominent in either arm.
	• the basilic vein is selected	• locate the brachial artery and only attempt the puncture if confident the artery will be avoided.
	• locating the vein takes more than one minute	• release the tourniquet and allow the blood to circulate through the arm for two minutes. • reapply the tourniquet and perform the puncture.
5	In outpatient areas and non-neonatal units, cleanse the site with a 70% isopropyl alcohol wipe, unless contraindicated. In the neonatal units, use a Chloroprep® Chlorhexidine Gluconate (CHG) pad. Allow to air dry. Residual alcohol or CHG may contaminate and/or hemolyze the sample, as well as create a burning sensation felt by the patient when the skin is punctured. Blowing on the site is not recommended. If the patient's arm requires excessive cleansing, repeat the process with several alcohol pads. **Directions for CHG use**: Clean the site with Chloroprep® (CHG) pad for a minimum of 30 seconds using friction in a back and forth, vertical, horizontal, and diagonal pattern. Allow antiseptic to remain at site and **completely air dry** (approximately 30 seconds). Refer to *Children's Policy 1230.00 Skin Antisepsis*. **NOTE:** The Chloroprep® (CHG) pad package instructions state "15 seconds", however *Children's Policy 1230.00 Skin Antisepsis* states "30 seconds". Follow Children's policy. If blood cultures are ordered, cleanse the site according to the Lab Test Directory on Star Net, Blood Culture. If a blood alcohol is ordered, use a non-alcohol based cleanser (Povidone Iodone preps) at the venipuncture site. Do **NOT** use betadine or chlorohexidine as these contain alcohol. Refer to the Lab Test Directory on Star Net - Alcohol, Ethyl.	
6	Open a new sterile device within view of the patient or family.	
Performing the puncture		
1	If using a syringe, unseat the plunger from the barrel by pulling back on it to break the seal, and then return the plunger fully forward, expelling all air from the barrel.	
2	Remove the sheath from the needle. Inspect tip of the needle visually to determine it is free of hooks at the end of the point and its opening is unobstructed.	
3	Grasp the patient's arm firmly, using your thumb to draw the skin taut. This anchors the vein.	

4	Inform the patient of the imminent puncture.	
5	Ensure the bevel of the needle faces up. Guide the needle into the skin and vein with a steady, forward motion at an angle of 30° or less. 	
6	When using a syringe, a flash of blood may appear in the hub of the needle. However, absence of a flash of blood should not be misinterpreted as an indication that the vein has not been accessed. Once the blood begins to flow, loosen the tourniquet with the free hand.	
	If	**Then**
	• blood is not obtained	• the tube may have lost its vacuum. • the needle may be improperly positioned in the vein. • the vein may be too small for the needle gauge used or a vacuum-assisted draw. • the pulling pressure is excessive, causing the needle's bevel to adhere to the upper wall of the vein.
7	Allow the tubes the tubes or syringe to fill. Fill tube(s) to their stated volumes. Follow the venipuncture order of draw for filling tubes/devices. Refer to procedure *SCM 3.05 Order of Draw*.	
8	Mix samples collected into additive tubes periodically during collection to prevent clotting of the specimen.	
9	Observe minimum fill requirements for additive tubes.	
	If	**Then**
	• additive tubes are underfilled	• the proper blood-to-anticoagulant ratio is disrupted, diluting the specimen and/or causing excessive anticoagulation. Fill tubes according to manufacturer's instructions, ie. 2mL EDTA needs at least 1mL blood for appropriate blood/anticoagulant ratio.
	• additive tubes are overfilled	• clot formation may result.
10	Instruct the patient to unclench his/her fist.	
11	With the free hand, release the tourniquet, if still applied.	
12	Lay a gauze pad lightly on the insertion point without applying pressure.	
13	Withdraw the needle, immediately activating the device's safety feature according to manufacturer's instructions. Dispose of needle in a sharps container.	
14	Apply pressure to the puncture site.	
15	If using a syringe - replace the needle with a safety transfer device and dispose of the contaminated needle. Fill tube(s) to their stated volumes, following the proper order of draw. Fill tube(s) to their stated volumes. Follow the venipuncture order of draw for filling tubes/devices. Refer to procedure *SCM 3.05 Order of Draw*.	
16	Gently invert tubes that contain additive 5-10 times.	
Post puncture care		
1	Apply firm pressure to the puncture site using a clean gauze pad until bleeding has stopped. Cooperative patients may be allowed to apply pressure. **NOTE: Bending the patient's arm up is not an adequate substitute for pressure.**	

2	Lift gauze and observe the puncture site for 5 to 10 seconds for superficial bleeding and any mounding or rising of the surrounding tissue.	
3	If the bleeding has not ceased, reapply pressure for 1 to 2 minutes and re-examine site. Repeat the process until bleeding has stopped.	
4	Evaluate the puncture site for evidence of continued bleeding. Bandage or cover the puncture site as appropriate.	
5	**If**	**Then**
	• the collection was performed in the neonatal units	• dress the puncture site, using 3M® Kind Removal Blue Silicone Tape and Antimicrobial IV Sponge 2x2 or gauze.
	• the patient is less than two (2) years of age and not in a neonatal unit	• do not bandage the puncture site. Bandages pose a choking/ingestion hazard should they become dislodged. Hold pressure until bleeding has stopped.
6	If appropriate, instruct the patient or family to leave the bandage in place for at least 15 minutes.	
7	Label all samples collected while still at the patient's bedside using the labels generated from the Sunquest® collection manager device, or the Sunquest® request label while matching the patient's full name and medical record number at a minimum. If blood collection occurs in an outpatient laboratory, label all tubes in the presence of the patient. **NOTE: Never pre-label collection tubes before the sample is obtained.** Refer to Children's Policy *630.00 Laboratory Specimen Labeling*.	
8	Compare the labeled tube to the patient's ID bracelet.	
Dismissing/Leaving the patient		
1	Evaluate the patient for signs of dizziness, nausea, hyperventilation, perspiration, pallor, etc. If there is any indication the patient did not tolerate the procedure well do not release the patient from your care until signs/symptoms subside. Refer to SCM 3.50 Phlebotomy Adverse Reactions.	
2	Inspect the area, remove and dispose of all supplies. For inpatients, take extra care to return the room to its previous arrangement. Ensure all bedrails or cribs are returned to their original, upright positions. Remove any unused labels from the patient's room or draw area.	
3	Remove gloves and perform hand hygiene.	
Unsuccessful Venipunctures		
1	**If**	**Then**
	• You anticipate the needle has advanced too far	• release the tube from the interior needle (tube holder draws), slowly withdraw the needle until you perceive to be within the vein. Attempt to establish a blood flow.
	• You anticipate the needle has not advanced far enough	• release the tube from the interior needle (tube holder draws), anchor the vein, and slowly advance the needle until you perceive to be within the vein. Attempt to establish a blood flow.
	• You have already attempted venipuncture twice on the same patient	• if possible, ask another person to attempt the draw.
	• You are in the basilic vein	• Lateral (side-to-side) needle relocation should not be attempted.

Procedure notes:

1. Guidelines for performance:
    a) Perform no more than two (2) venipunctures per patient per test(s) request per laboratorian.
    b) Limit attempts to two (2) laboratorians per patient – before referring to care giver.
    c) Probing is unacceptable as follows:
        (1) Sideways movement
        (2) Fishing
        (3) Searching
        (4) Haphazard needle movement
        (5) Prolonged
        (6) Digging
    d) Evaluate your own performance, ie. If >20% of your patient attempts need two (2) or more venipunctures, ask your supervisor or manager for extra training and/or hints.

2. Special considerations
    a) Timed intervals – It is important that collection of specimens for Timed tests is obtained at the specific time.
    b) Laboratory staff do **not** draw from head/scalp veins.
    c) In Minneapolis, laboratory staff do **not** perform venipunctures on patients in the NICU and Special Care Nursery (SCN).

3. Coagulation testing
    a) When drawing coagulation testing with a butterfly needle and a vacutainer, use a red top to draw the air out of the tubing.

4. Preventing a hematoma
    a) Puncture only the uppermost wall of the vein.
    b) Remove the tourniquet before removing the needle.
    c) Use the major superficial veins.
    d) Before bandaging the site, ensure bleeding has stopped.

5. Preventing hemolysis
    a) Mix anticoagulated specimens gently but thoroughly by inverting at least 8-10 times.
    b) Avoid drawing blood through a hematoma.
    c) Avoid drawing the plunger back too forcefully.
    d) Make sure the needle is sealed tight to avoid frothing.
    e) Ensure the venipuncture site is dry.

References

1. CLSI. *Procedures for the Collection of Diagnostic Blood Specimens by Venipuncture, GP41-A6, Oct 2007*. Clinical and Laboratory Standards Institute, Wayne, PA. 2007.
2. *Phlebotomy Handbook* 8th Edition, 2010, Garza EdD, MLS (ASCP), Diana
3. Center for Phlebotomy Education, Inc.
4. Lippincott Procedures. *Finger and Heel Sticks, Pediatrics,* revised July 10, 2015. www.procedures.lww.com.
5. *WHO Guidelines on Drawing Blood: Best Practices in Phlebotomy*, Geneva, Switzerland, 2010. World Health Organization.