1.0 Purpose

1.1 The pre-analytical portion of a test result is just as important in patient care, as the analytical and post analytical portions. With today's sophisticated instrumentation used in our laboratories, specimen requirements for the most part have gone from milliliters to micro liters, without affecting the accuracy of the results. A laboratory's results are only as good as the specimen being tested. Thus the need for quality specimens becomes even more important in today's health care setting.

1.2 Laboratories are getting pressured everyday for decreased turnaround times. The longer a patient stays in the hospital the more it costs. Redrawing a patient is timely, costly and could negatively impact the outcome of the patient's health care. That's why it's so important to have a standardize collection procedure.

1.3 The way a sample is handled prior to testing can affect the reported result. Patient identification, order of draw, correct use of additive tubes, labeling, timing of collection, clerical help are all steps that need to be uniform to produce that standardized collection process, regardless of who draws the blood.

2.0 Materials

Supplies
PPE as required by site specific policy and/or Isolation Precautions
Latex free or vinyl gloves
Needles & Vacutainer holders and/or winged collection sets
Assorted blood collection tubes
Latex free tourniquets
Alcohol Pads;(70% isopropyl or ethyl alcohol)
Non-alcohol pads; (1 to 10% povidone-iodine) Pads
Gauze pads
Cotton balls
Sharps container
Medical tape
Bandages

NOTE: All supplies/equipment is stored according to manufacturers' storage requirements

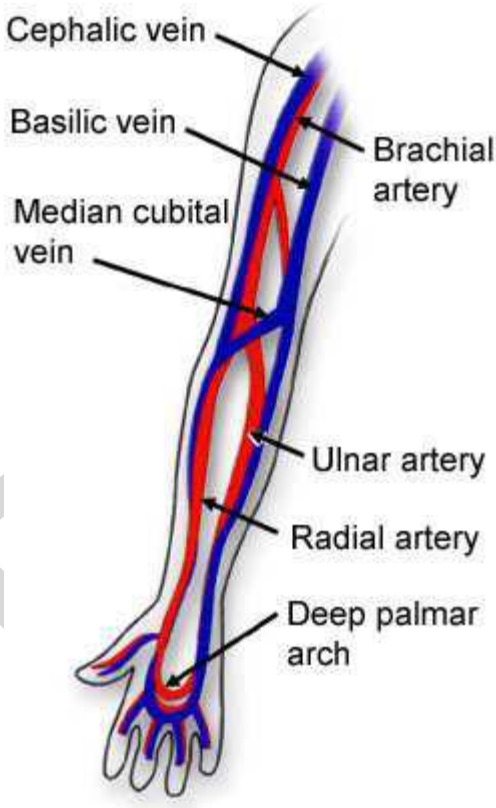
3.0 Quality Control

3.1 Initial & 6 month competency

3.2 Annual phlebotomy competency

4.0 Procedure

Step	Action
4.1	• Approach and identify yourself to patient. **Note:** Throughout the phlebotomy process the individual must demonstrate the ability to take into account population and aged based specific factors.
4.2	• Patient Identification o All patients must be identified in accordance with each hospital patient identification policies. This minimally requires at least 2 identifiers unique to the patient. o Patients needing blood bank specimens must be identified and samples collected according to each sites specific Transfusion Policy.
4.3	• Verify whether or not patient conformed to testing restrictions; o Is patient fasting? o Date and time of last dose of medication. o No food, liquid, chewing gum, or other objects should be in the patient's mouth at the time phlebotomy is performed.
4.4	• Gather and assemble necessary supplies. o Locate tubes for testing requested. o Inspect supplies for outdate or damage. Discard appropriately if either is present. o Assemble needle or butterfly winged needle into Vacutainer holder or syringe. o Open cleanser pad packet. o Set aside 2 or 3 gauze pads/cotton balls. o Have small piece of tape ready. o Tourniquet. o Gloves **Note:** The use of a butterfly needle should be limited to special circumstances due to the increased likely hood of samples hemolyzing and/or clotting during collection.
4.5	• Sanitize hands with alcohol sanitizer and/or wash hands with soap and water.
4.6	• Put non-latex gloves on both hands. **Note:** Severe hypersensitivity to latex has been reported to cause anaphylactic shock.
4.7	• Position patients arm for phlebotomy. o Due to the potential for complications due to lymphostasis, only properly trained medical personnel may draw out of the arm in which a mastectomy was performed. o An arm with a fistula should not be used for blood drawing. A fistula is an artificial shunt connection done by a surgical procedure to fuse the vein and artery together. It is used for dialysis only. Phlebotomy must not be performed on any size hematoma. Specimens collected through a hematoma area may cause erroneous test results. If another vein site is not available, the specimen is collected distal (above) the hematoma. o Preferably, specimens should not be collected from an arm with an IV site. If there is no choice but to draw the blood out of the arm that has an IV, it is required to draw below the IV site (running or not). If the only site to draw blood is above a running IV, it is mandated that the IV solution be stopped for 2 minutes prior to drawing the blood. Contact the patients nurse to stop the IV.

	○ Collection from a cannulated arm is not done by Laboratory personnel. This can only be performed by a Registered Nurse (RN) or the attending physician. **Note:** For patient safety, draw all specimens with the patient seated comfortably in an appropriate chair or lying down. No phlebotomy is to be performed on a standing patient.
4.8	• Apply tourniquet ○ Tourniquet is to be applied 3-4 inches above intended venipuncture site. ○ Once tourniquet is in place it can remain in place for only one minute. If more time is needed, you must release tourniquet, wait for at least 2 minutes before reapplying tourniquet. ○ Blood drawing tourniquets must be discarded after the blood drawing is completed on each patinet.
4.9	• Palpate and locate vein to be drawn. Select vein (see figure 1 below) ○ The three veins primarily used for venipuncture are the median cubital, cephalic and basilic (in order of preference). ○ Basilic vein should be considered third due to the proximity to the brachial artery and median nerve ○ Veins on back of hand are also acceptable  ○ Apply the tourniquet according to procedure described above ○ Using the index finger, palpate (feel) for a vein. Visible veins should likewise be palpated to be certain of their location and direction.
4.10	• Clean site using alcohol or non-alcohol based cleanser.

4.11	• Wipe excess cleanser off with a gauze pad or cotton ball and/or let air dry. • If sterile site is desired, then clean with area with an antiseptic towelette / swab and let air dry. Do not wipe or touch area after cleansing the site.
4.12	• Perform venipuncture. o Anchor vein o Needle bevel up o Insert needle in a smooth motion at 15-30 degree angle to the arm.
4.13	• Fill required tubes, using the correct order of draw. o Yellow or blood culture bottles / tubes- typically used for cultures & sensitivities. **Refer to site specific Blood Culture policy for specific instructions. o Light blue- typically used for coagulation studies. Requires specific dilution of anticoagulant to blood. Fill to appropriate line on tube. o Red / marble / yellow / gold-typically used for chemistry or immunochemistry. o Mint / green- typically used for chemistry testing. o Lavender / pink / white- typically used for hematology, blood bank, or molecular testing. o Gray- typically used for lactate testing. o Miscellaneous tubes- follow manufacture recommended order of draw. **Note:** Plastic or glass serum tubes containing a clot activator may cause interference in coagulation testing. Glass non-additive serum tubes or plastic serum tubes without a clot activator may be drawn before the coagulation tube. **Note:** When using a winged blood collection set for venipuncture and a coagulation tube is the first tube needed, first draw a discard tube. The discard tube must be used to prime the tubing of the collection set, which will assure maintenance of the proper anticoagulant/blood ratio in the tube filled. The discard tube should be a non-additive or a coagulation tube, and need not be completely filled. **Note:** Blue topped tubes have a specific dilution factor of blood to anticoagulant. This requires the tube to be filled to an acceptable level in order to produce reliable results. Any tube under or over filled, needs to be discard and redrawn.
4.14	• Release the tourniquet as soon as possible after the blood flow begins to fill the tubes.
4.15	• Place gauze over puncture site, and remove needle.
4.16	• Apply pressure on site of puncture. Checks to make sure bleeding has stopped and apply tape over gauze.
4.17	• After removal of needle, immediately activate safety device and dispose of needle in appropriate sharps container. **Note:** If first blood draw attempt is unsuccessful, the needle's safety device must be activated and discarded. A new set of blood drawing supplies must be used for the second attempt. **Note:** If the blood specimen is not collected after two unsuccessful sticks by one phlebotomist, the drawer will inform the nursing staff that the blood specimen was not collected.

4.18	• Record time of draw and initials on each label. Affix labels to appropriate tubes while in the presence of the patient. o Iron Mountain site specific: All laboratory specimens must be labeled with a computer generated barcode label or hand written label containing patient's name, ward, SSN, date, accession # and phlebotomist initials. By procedure, the verification of the full name is noted by the phlebotomist's initials and verification of the SSN is noted by a notation adjacent to the printed SSN (circle, check mark, line). Specimens from the emergency room must adhere to the above and include a time of draw. o Hines site specific: All samples collected by the laboratory personnel undergoes final verification of patient identification when phlebotomist reviews the name and social security number and subsequently underscores it in red ink upon confirmation that information is correct. o Tomah site specific: Recording draw time on each tube is not required since this information is automatically captured in VISTA during the accessioning process which takes place at the time of draw.
4.19	• Invert tubes according to manufacture recommendations. Perform any special handling requirements if necessary.
4.20	• Instruct patient to leave bandage on for at least 15 minutes after phlebotomy procedure.
4.21	• Wash or sanitize hands. **Note:** If there are any minor complications including hematomas, nausea and fainting during the blood drawing procedure, follow the corrective action on Emergency / Complication Chart in section 5.1 of this procedure. More serious reactions must be documented in the Patient Event Reporting System (ePER).
4.22	• Deliver specimens to laboratory for testing.

5.0 Procedural Notes

5.1 Emergency / Complication Chart

Minor Complication	Cause	Corrective Action
Failure to Draw Blood	Inserting the needle too deep and going through the vein. Inserting the needle not deep enough, being above the vein. The bevel of the needle not facing up. Losing the vacuum of the collection tube.	Sometimes you can slowly pull back or with-draw the needle. Redirect the needle and go deeper; never probe or relocate laterally. Need to begin again. Always check expiration dates of tubes and have extra tubes handy.
Fainting (Vasovagal Syncope)	Patient experiences dizziness during or after the venipuncture through an emotional stimulus such as fright or the sight of blood. There is a sudden decrease in blood pressure and a temporary loss of consciousness.	Protect the patient from falling; lower the patient's head between the knees. Alert the physician. If fainting occurs during the procedure, always remove the tourniquet and withdraw the needle. Call ER for assistance and advice.
Hematoma	Blood leaks from the vein into the surrounding tissue, resulting in a purple bruise.	Remove the tourniquet and withdraw the needle. Apply pressure until the site stops bleeding.
Edema	Swelling caused by an abnormal accumulation of fluid under the skin. Sometimes caused by the IV line.	Avoid the site. Specimens can be contaminated with excess tissue fluid.
Obesity	In the heavier patient, veins may not be accessible.	The use of a blood pressure cuff can make the veins more prominent. Do not probe blindly.
Intravenous (IV) Therapy	If an IV is running, blood should not be drawn from that arm if possible.	Draw below the IV site or stop the infusion for 2 minutes, discard 5 mL of blood; then begin filling tubes
Hemoconcentration	An increase of analytes in the blood due to a shift in water balance. The tourniquet or prolonged massaging can cause this increase.	The tourniquet should not remain on any longer than 1 minute.
Hemolysis	The damaging or breakdown of red blood cells with the release of hemoglobin into the specimen.	Use a correct gauge needle for blood collection, practice good technique, mix gently, and make sure alcohol is dry before performing blood collection.
Scarred or Sclerosed Veins	After repeated venipunctures, the wall of the vein develops scar tissue; or veins may have been damaged by chemotherapy.	Should be avoided. Try to use an alternative site. If not possible, avoid inserting the needle through the vein.

Minor Complication	Cause	Corrective Action
Mastectomy	The removal of a breast whereby the patient may have had the lymph nodes removed. These patients are susceptible to infections.	Never draw blood from the same side as the mastectomy. Never apply a tourniquet to this site. Use an alternate site.
Double Mastectomy	Need physician's approval.	Rule of thumb is to draw from oldest surgical side first.
Allergies	Reactions to the antiseptic or the adhesive bandages.	Do not use alcohol, use iodine. Use a hypoallergenic tape.
Rolling Veins	When veins tend to move away from the needle.	To avoid rolling, a firm pressure to anchor the vein is applied until the needle is inserted.
Collapsing Veins	Small veins or veins with thin walls. The pressure from the vacuum in the tubes causes a sucking action and prevents the blood from flowing into the tube.	Use a syringe or butterfly with a small gauge needle where the pressure can be controlled in the drawing.

Serious Complication	Cause	Corrective Action
Vomiting	Ejection of stomach contents usually brought on by the thought or sight of blood, in response to an adverse reaction to blood collection.	Have the patient take deep breaths. Place a cold compress on the patient's head and make him or her comfortable. Alert the physician and initiate ePER report.
Seizures/ Convulsion	Can be from a preexisting condition or an adverse response to the needle stick.	The tourniquet is removed immediately and the needle is withdrawn. Do not restrain the convulsing patient except to prevent self- injury. Alert the physician and initiate ePER report.

5.2 Blood tube chart

Tube Color (Listed in order of draw)	**Description**	**Additive**	**Inversions**	**Comments**
Yellow	Blood Culture Bottles, 40mL, Plastic	BacT Alert	8-10	Aerobic & Anaerobic Blood Cultures
Yellow	Isolator 10/Yellow Top, 10mL, Plastic	SPS	8	Fungal & Mycobacterial Blood Cultures
Light Blue	Blue, 2.7mL, Plastic	Sodium Citrate 0.109M, 3.2%*	3-4	Coagulation
Red	Red, 10mL, Glass	None	5	Toxicology
Red	Red, 6mL, Plastic	Clot activator	5	Chemistry, Immunochemistry, Serology
Gold	Gold/SST, 5mL, Plastic	Clot activator with gel separator	5	Chemistry, Immunochemistry, Serology
Mint	Mint, 4.5mL, Plastic	Lithium heparin with gel separator	8	Chemistry
Green	Green, 10mL or 3mL, Glass or Plastic	Sodium heparin	8	Chemistry
Lavender	Purple, 3mL, Plastic	K_2EDTA 5.4 mg	8	Hematology
Pink	Pink, 6mL, Plastic	K_2EDTA 10.8 mg	8	Blood Bank
White	White, 5mL, Plastic	K_2EDTA with gel separator	8	Molecular biology
Gray	Gray, 3mL, Plastic	Sodium fluoride /Potassium Oxalate (10mg/8mg)	8	Chemistry

5.3 Exposure

The phlebotomist must immediately report an accidental needle stick or contamination of a break in the skin by blood or excreta to a supervisor.

6.0 References and Related Documents

6.1 Clinical and Laboratory Standards Institute, Document H3-A6 Volume 27 No.26 Procedures for the Collection of Diagnostic Specimens by venipuncture- Sixth Edition, 2007

6.2 Craig A. Lehmann, PhD, CC(NRCC),Table from Saunders Manual of Clinical Laboratory Science W. B. Saunders Company, 1998

6.3 BD / Becton Dickinson and Company © 2010 BD04/10 V55734-5Blood Drawing Tubes / additive / invert information 4.10,

6.4 John Bernard Henry, MD.:Clinical Diagnosis and Management by Laboratory Methods, Sixteenth Edition. 1979 W.B. Saunders Company, Philadelphia London Toronto