

## COLLECTING A BLOOD SAMPLE

### Patient Considerations

#### Fasting

Patients should be instructed not to have anything to eat or drink for at least 8 hours. Water is acceptable. The patient should continue to take any medications that have been prescribed, unless otherwise directed by the physician. If the patient usually takes their medication with food, please tell them to refrain until after the sample has been collected. It is important for the patient to hydrate.

#### Other Factors

Smoking and exercise may affect test result. Please ask patients to refrain from these activities until their sample has been collected.

#### General Information

1. It is important to have all equipment, supplies, and test orders ready for the procedure.
2. Wash your hands before each patient.
3. Gloves must be worn when performing any venipuncture or fingerstick. Gloves must also be worn when processing the lab samples.
4. Whenever collecting laboratory samples, the patient must be identified using at least two patient identifiers. Label the samples immediately after collection and in the presence of the patient. For proper labeling use the patients' full legal name (no nick names), date of birth and, University of Vermont Medical Center (UVMMC) MRN if available. The date and time the sample was collected is also helpful.

### Blood Bank Sample Collection

Only authorized personnel can collect Blood Bank samples used for transfusion, Contact blood bank for information 847-5121.

### Venipuncture

1. To help find a site for venipuncture use a soft flexible tourniquet. Place the tourniquet around the arm above the bend of the elbow (2-3 inches) in such a way that a pull of one end will allow for easy release. It should be tight but not painful to the patient. Do not leave the tourniquet on for more than one minute.
2. Palpate for a suitable vein. Once the site has been selected, use concentric circles to decontaminate it with 70% alcohol. The alcohol should be allowed to air dry after preparing the site. Do not wipe off with gauze. If this is not done, alcohol will sting at the puncture site and can interfere with some test results.
3. Once the site has been decontaminated DO NOT touch the actual puncture site. Put on gloves.
4. Prepare the needle assembly. Do not uncap the needle until you are ready to perform the venipuncture.

5. Anchor the vein. This is very important so the vein does not move when inserting the needle. Using the thumb of your non-dominant hand pull down on the patient's skin approximately 3 inches below the intended venipuncture site. You may also use your index finger above the site but is not practiced universally.
6. Hold the assembly with the first tube in place between your thumb and third and fourth fingers of your dominant hand. Your fingers should never come in contact with the exposed needle. The needle should run the same direction as the vein and should be inserted at a 15-30 degree angle with the bevel side upward, slightly below the vein. Once the needle is in the vein the test tube should be gently pushed forward to puncture the rubber stopper and allow blood to fill the tube. Hold firmly onto the needle holder to prevent the needle from moving as you push the test tube onto the needle.
7. The tube should continue to fill until the blood flow stops (vacuum has been exhausted). Remove tube from assembly and gently invert the tube 5 to 7 times for light blue top tubes and 8 to 10 times for all others to mix the blood. Never shake a tube containing blood. When drawing multiple tubes each tube should be gently removed from the holder and replaced with the next tube.
8. The correct order for tubes to be collected so there is no contamination or transfer of anticoagulants is as follows:
  1. Blood Cultures
  2. Light Blue Top Tube
  3. Red Top, NO GEL
  4. Serum Gel Tube
  5. Green Top Tube
  6. Lavender Top Tube/Pink Top Tube
  7. Grey Top Tube
9. If blood has been collected into one tube, it should never be transferred to another tube.
10. Release the tourniquet, withdraw the needle, and apply pressure with a dry gauze pad for two minutes, or until bleeding has stopped. DO NOT BEND the arm. The arm may be elevated.
11. Do not recap the needle. Dispose of the needle and holder assembly in a puncture proof needle disposal container.
12. Label the tubes at the patient's side see "Laboratory Specimen Acceptability Policy"). Samples should not be left on a counter top or bed unlabeled.
13. After labeling tubes, check the patient's arm for proper clotting by dabbing the gauze and stretching the skin at the puncture site. Apply a pressure bandage to reduce the risk of bruising. Instruct the patient to remove the bandage after one hour.

## Hemolysis of Blood Specimens

Hemolysis is due to red blood cells lysing or breaking-up, causing constituents inside the cell to spill into the serum or plasma. Hemolysis is important because it can effect test results. Some lab tests are effected more than others by hemolysis, the effects can be caused by-products liberated from the red cells, or due to interferences with laboratory analyzers.

The most common causes of hemolysis occur during blood collection, listed here are a few of the most common collection errors that can lead to hemolysis.

#### Common Causes of Hemolysis During Sample Collection

- Not letting the venipuncture site completely dry after cleansing with 70% alcohol or betadine.
- Putting the tourniquet on too tight or leaving the tourniquet on the arm for more than one minute. You usually can release the tourniquet as soon as the blood starts to flow into the tube.
- Using too small a gauge needles for blood collection. Needles should be 21 or 23 gauge to facilitate steady blood flow into the tube or syringe. A larger bore needle can cause too much suction on a small or weak vein, collapsing it. If you use too small of a needle, the shearing forces on the cells as they enter the needle can cause hemolysis.
- Forcing blood into or out of a syringe. Before drawing the blood in a syringe move the plunger within the barrel several times to ensure ease of movement. A 5mL, 10mL, or 20 mL syringe is recommended, larger syringes require more force to pull out the plunger and this can cause hemolysis. It is extremely important to draw the blood SLOWLY into the syringe, keeping the level of the blood close or at the edge of the plunger. If the blood is drawing slowly, do not pull back harder. If you use a syringe you will need to transfer the blood to the proper tubes. Never force the flow of blood into the tube, let the vacuum fill the tube.
- Mixing the blood sample too vigorously. NEVER SHAKE THE TUBE; always gently invert the tube 5 to 7 times for light blue tops and 8 to 10 times for all others to mix anticoagulant with the blood. (Some testing may require special handling. Refer to test catalog for special instructions)
- The tube must be inserted straight into the needle adapter/holder. If the needle that goes inside the collection tube is crooked and is resting near the side of the tube or is not completely inside the stopper, this can cause hemolysis.
- Do not remove the needle from the vein until you have removed the collection tube from the adapter/holder. If there is vacuum left in the tube, the sudden burst of air into the tube from the needle can cause hemolysis and pain to the patient.
- Do not centrifuge blood for longer than 15 minutes. Temperatures can build up in successive runs and this can cause hemolysis. To minimize temperature build up, the centrifuge should be left idle for 10 minutes with the cover open between sequential runs.

Hemolysis can occur in other scenarios, if you have a particular instance you would like to discuss please call Laboratory Customer Service (802)847-5121.