

# Blood Specimen Collection

It is important that specimens are properly collected, prepared and preserved. Your help is needed to assure the stability of specimens and the accuracy of test results by using the following information as a guide when obtaining or preparing laboratory specimens. If you have questions about patient preparation or specimen collection, please call Client Services before drawing the patient.

## Specimen Requirements

The specimen requirements are provided in the Testing Guide for each test. They specify requested volume, specimen type, storage temperatures and any special handling notes. The requested volume is an amount sufficient to allow repeat runs of the assay if necessary. For each test requiring a FROZEN specimen, separate transport vials should be used. This will prevent thawing and re-freezing of the sample if the tests are performed on different days. Special protocols, which require more detailed specimen collection instructions, may be referred to in the Supplemental Information Section.

## Patient Preparation

### Fasting vs. Non-fasting

Normal or reference values are frequently based on collections from patients who are in a basal or fasting state. An overnight fast is required to ensure that the patient is at basal levels. An overnight fast means nothing to eat or drink, except a small amount of water, for 12 – 16 hours after an evening meal. Any specimen collected after the patient has eaten should be designated non-fasting to allow flexible interpretation of results.

### Medications

Many commonly prescribed medications will interfere with the actual chemical assay being performed or alter the levels of the compound being assayed. If the patient has taken prescription or non-prescription medication, this information should be noted on the request form. Questions regarding drug interference may be directed to Client Service or the pathology staff.

## Blood Collection and Preparation

### Venipuncture

NOTE: Always use the appropriate personal protective equipment when collecting patient specimens.

1. Properly identify and reassure the patient.
2. Assemble all materials and equipment necessary for venipuncture.
3. Apply tourniquet around the 3-4 inches above the venipuncture site. Ask patient to form a tight fist and select vein for venipuncture.
4. Cleanse venipuncture site with 70% alcohol. Allow area to dry to prevent burning sensation or hemolysis. Do not touch the area with anything that is not sterile.
5. Do not allow the tourniquet to remain tied for more than one minute. If the cleansing and vein search takes longer, remove the tourniquet and reapply as needed.
6. Anchor the vein firmly, both above and below the puncture site with thumb and index finger. Ensure that the arm is in a downward position so that blood cannot flow back from the tube.



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7. Perform venipuncture with needle at 15-degree angle, bevel of the needle up, and following the vein with the needle.
8. When good blood flow is established and collection is nearly complete, ask patient to relax hand and release tourniquet. Do not allow patient to pump their hand. The tourniquet should be released after no more than one minute tied on the arm. Longer application may result in localized stasis, hemoconcentration, or hematoma.
9. When collection is complete, withdraw needle and apply cotton/gauze to puncture site with pressure to stop bleeding. Bandage over the cotton/gauze.
10. Gently invert specimen 5-10 times to mix thoroughly.
11. Check the patient's condition and that the bleeding is under control.
12. Label specimens clearly with the patient's name (first and last name), patient birth date, the specimen collection date and time, and the initials of the phlebotomist (person performing the blood collection.)
13. Dispose of contaminated material appropriately.

## Processing

### Serum and Serum Separator Tubes

1. A serum separator tube contains a silicone barrier gel with a specific gravity intermediate to serum and cell clot. After drawing, gently invert the tube 5-10 times to assure adequate distribution of the glass powder, which activates the clotting mechanism. This tube is inappropriate for some tests and a plain red top tube should be used when indicated.
2. Allow the sample to clot in a vertical position for 20-30 minutes or until a firm clot is established to prevent fibrin formation.
3. Centrifuge within one hour for 10-15 minutes or until good separation of serum from cells is obtained. Separate the serum into a plastic transport vial as soon as possible.
4. Label specimens clearly with the patient's name (first and last name), patient birth date, the specimen collection date and time, and the initials of the phlebotomist (person performing the blood collection.)
5. Store serum at designated temperature for transport to the laboratory.

### Plasma Tubes

1. Draw a sufficient amount of blood with the indicated anticoagulant to yield the necessary plasma volume.
2. Gently mix the blood collection tube by inverting six to ten times immediately after collection.
3. If required, separate plasma from cells by centrifugation within 20-30 minutes after collection.
4. Label specimens clearly with the patient's name (first and last name), patient birth date, the specimen collection date and time, and the initials of the phlebotomist (person performing the blood collection.)
5. Label the transport tube as "PLASMA".
6. Store specimen at designated temperature for transport to the laboratory.

### Blood Smear Preparation

When requested, properly prepared and submitted smears are essential to accurately assess the patient's status. EDTA anticoagulated blood may be used if the smear is made within one hour of collection.

1. Put a small drop of blood on one end of slide.



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2. Draw spreader slide toward the drop at a 30-degree angle until it touches the drop of blood. The blood will spread behind the spreader slide by capillary action and should be allowed to spread the full width of the spreader slide.
3. Push spreader slide smoothly and quickly down the slide producing a feathered edge.
4. Allow the slide to air dry. With a lead pencil, label the slides with patient's name on the thick end of smear (opposite the feathered edge).

## Glucose and Lactose Tolerance Testing

For glucose and lactose tolerance testing, multiple timed specimens are collected and submitted together on a patient. Be sure that all specimens are properly labeled with times of collection. Specimen requirements for the blood specimens are the same as for glucose. See Patient Instruction sheet for more information

## Viral Antibody Testing

It is recommended for most viral antibody tests that both acute and convalescent titers be submitted. The acute serum sample may be collected and frozen. The convalescent sample should be collected 21 days later. Both specimens can be submitted together. Label the tubes as "acute" or "convalescent". Changes in the titers of the antibody are very helpful in determining patient viral exposure and disease process.

## Blood Collection and Preparation Notes

1. When using multi-draw vacutainer system, draw tubes in the following order:
  - a. All draws required to be sterile (i.e. blood cultures)
  - b. Citrate containing tubes (blue top)
  - c. Plain non-additive tubes (plain red top, SST red top, plain royal blue)
  - d. Heparin containing tubes (green top)
  - e. EDTA containing tubes (lavender top, EDTA royal blue top)
  - f. Oxalate/fluoride containing tubes (gray top)
2. Tubes with powdered anticoagulants should be tapped near the stopper to dislodge any anticoagulant that may be lodged between the stopper and the wall of the tube.
3. All tubes with liquid anticoagulants should be filled to the exhaustion of the vacuum to ensure proper ratio of anticoagulant to blood.
4. All tubes with anticoagulant should be mixed thoroughly by gentle inversion 5-10 times. DO NOT SHAKE. As tubes are drawn, previous tubes may be mixed.
5. EDTA capillary tubes should be filled to 250 mg.
6. Blue tubes **MUST** be as full as the vacuum allows. An uncomplicated direct venipuncture may be performed using only a needle and vacuum collection tube to obtain a single specimen for coagulation. If a blood collection set is used to obtain a single specimen for coagulation, a waste tube must be used to draw blood through the tubing of the collection set. If multiple specimens are obtained using a blood collection set, a serum tube without additives may be drawn first instead of a waste tube.
7. Collection of coagulation specimens through intravenous lines that have been flushed with heparin should be avoided. If coagulation specimens must be drawn through indwelling catheters, the line should be flushed with 5 mL of saline, and the first 5 mL of blood drawn from the indwelling catheter should be discarded before drawing coagulation specimens.

