

Specimen Collection and Preparation

Blood Collection

Most laboratory tests are performed on anticoagulated whole blood, plasma, or serum. In general, specimens should be refrigerated until picked up for transport to the laboratory. Please see our individual test directory section for specific requirements.

- **Plasma:** Draw a sufficient amount of blood with the indicated anticoagulant to yield the necessary plasma volume. Gently mix the tube by inverting 6 to 10 times immediately after draw.
- **Serum:** Draw a sufficient amount of blood to yield the necessary serum volume. Allow blood to clot at ambient temperature, and then, separate serum from clot by centrifugation within 20 to 30 minutes.
- **Whole Blood:** Draw a sufficient amount of blood with the indicated anticoagulant. Gently mix the tube by inverting 6 to 10 times immediately after draw.

Preparation of Outpatients for Laboratory Testing

Outpatients occasionally arrive for testing improperly prepared for their ordered procedure. A blood draw at this particular time could lead to erroneous results which may be misleading and/or clinically inapplicable. The majority are either patients who should be fasting (and are not) or who arrive at a time inappropriate for therapeutic drug monitoring. These patients will be advised of the wrong timing for their test and will be requested to return under the proper conditions. Under certain circumstances, if the test is part of a larger profile, the blood will be drawn with a comment noting the inappropriate collection for that particular test. A patient will be drawn regardless of the timing protocol if the physician specifically requests it in the written order.

Patient Fasting—Patients who have not fasted according to specimen requirements will be asked to return after fasting for the following tests:

- Cholesterol, Plasma or Serum
- Glucose, Plasma or Serum
- Glucose Tolerance, 2 Hour
- Glucose Tolerance, 3 Hour
- Glucose Tolerance, 5 Hour
- Lipid Panel
- Triglycerides, Plasma or Serum

Ideally, the patient should be fasting for the following tests, but their blood will be drawn noting their non-fasting status:

- Metabolic Basic Panel
- Metabolic Comprehensive Panel

Ideally, the blood should be drawn for the following drug levels just prior to the next dose. If this is not the case, the patient will be drawn noting the time of the last dose in the comment section on the report.

- Phenytoin (Dilantin®), Serum
- Phenobarbital, Serum
- Valproate, Serum

The following minimum times must have elapsed since the ingestion of the last dose for the following therapeutic drug levels:

- Acetaminophen, Serum-4 hours
- Digoxin, Serum-6 hours
- Salicylate, Serum-3 hours after oral dose and 6 hours after injection for patients undergoing acute therapy
- Carbamazepine, Serum-12 hours (recommended, draw in a.m. 12 hours past p.m. dose)

Specimen Collection Tubes Available

The following is a list of tubes referred to in our specimen requirements:

- **Green Top (Sodium Heparin):** This tube is used for the collection of heparinized plasma or whole blood and is used for most chemistry tests.
Note: After tube has been filled with blood, immediately invert tube 6 to 10 times to prevent clotting.
- **Grey Top (Oxalate):** This tube contains potassium oxalate as an anticoagulant and sodium fluoride as a preservative. It is used to test alcohol and lactate.
Note: After tube has been filled with blood, immediately invert tube 6 to 10 times to prevent clotting.
- **Lavender Top (EDTA):** This tube is used most often for hematological procedures, glycated hemoglobin analysis, and Blood Bank testing (Pink Top for TS/TS with Crossmatches).
Note: After tube has been filled with blood, immediately invert tube 6 to 10 times to prevent clotting.
- **Light-Blue Top (Citrate):** This tube contains 0.5 mL of 0.105M 3.2% buffered sodium citrate solution and is used for coagulation studies. Fill tube completely to avoid specimen rejection.
Note: After tube has been filled with blood, immediately invert tube 6 to 10 times to prevent clotting. It is imperative that the tube be completely filled.

Ratio of blood to coagulant is critical for prothrombin time results. If the tube is not filled, the lab will reject the specimen as unacceptable.

- ***Light-Green Top (Lithium Heparin)***: This tube is used for the collection of heparinized plasma or whole blood for special tests.
Note: After tube has been filled with blood, immediately invert tube 6 to 10 times to prevent clotting.
- ***Red Top***: This tube is plain or it may contain a clot activator. It is used for special tests whenever serum gel tubes are not acceptable. Allow blood to clot at ambient temperature for 30 to 60 minutes before centrifugation.
- ***Royal-Blue Top***: There are 2 types of royal blue-top tubes—one with the anticoagulant EDTA and the other plain. These are used in the collection of whole blood or serum for trace element analysis. Refer to the individual metals in the individual test listings to determine the tube type necessary.
- ***Serum Gel (SST®)***: This tube has a marbled, red-top stopper and is used for chemistry and special tests. Invert tube 5 to 10 times and allow to clot for 20 minutes. It contains a gel layer which, when centrifuged, separates the serum from the clot.
- ***Yellow Top (ACD)***: This tube is used for the collection of whole blood for special tests.
Note: After tube has been filled with blood, immediately invert tube 6 to 10 times to prevent clotting.
- ***Yellow Top (Gel)***: This tube has gel and is for the collection of serum. It is used for chemistry and serology/immunology tests.

Tubes of blood are to be kept in an upright position.

Urine Collection

24-Hour Urine Collections: Mayo Medical Laboratories provides 24-hour urine collection containers.

Use the following procedure for correct specimen collection and preparation.

- Warn patient of presence of potentially hazardous preservatives in collection container.
- Instruct patient to discard **first-morning** specimen and to record time of voiding.
- Patient should collect all subsequent voided urine for remainder of the day and night.
- Collect **first-morning** specimen on day 2 at same time as noted on day 1.

- Please mix well before aliquoting and provide total volume of 24-hour urine collection.

See “Urine Preservatives” in “Special Instructions” for multiple collections.

Random Collections: For routine analysis and microscopic evaluation, have patient void into a clean container. Specimen should be capped, labeled, and refrigerated until courier pickup time. A “clean-catch” or midstream specimen is preferred. Patient should first void a small amount of urine which is discarded. Some of the urine should then be collected in a clean container before voiding is completed.