

Specimen Collection, Preparation, and Transportation

All specimens must be clearly labeled with patient's name, identification number (medical record number, Social Security number, or date of birth), date, and source of specimen.

Any discrepancies regarding specimen labeling, inadequate or invalid specimen, or tests requested will be brought to the attention of the ordering facility as soon as possible by our client services personnel. Our intent is to resolve any questions as soon as possible with the least disruption of your office.

Blood Collection

Most laboratory tests are performed on anticoagulated whole blood, plasma, or serum. Please see our individual test directory section for specific requirements.

- **Plasma:** Plasma is the clear liquid portion of blood that is separated following centrifugation of anticoagulated blood. Anticoagulated blood is drawn in an assortment of different tubes, EDTA (lavender), Citrate (blue), Heparin (green), or Oxalate (grey). These tubes must be mixed gently after blood is drawn. Plasma must be placed in properly labeled aliquot tube(s) to be submitted to the laboratory.
- **Serum:** Serum is the clear liquid portion of blood that is separated following centrifugation of clotted blood. A room temperature or refrigerated serum specimen may be submitted in either a centrifuged serum gel tube, or an aliquot of serum submitted in a properly labeled plastic aliquot tube. FROZEN SERUM must be frozen solid prior to transport to the laboratory for testing to avoid thawing of specimen and invalidating test results.
- **Whole Blood:** Draw a sufficient amount of blood with the indicated anticoagulant. Gently mix the blood collection tube by inverting 5 to 6 times immediately after draw.

Specimen Collection Tubes

The following is a list of tubes referred to in "Specimen Required" in the individual tests:

- **Green-Top Tube:** This tube contains sodium heparin or lithium heparin—used for the collection of heparinized plasma or whole blood for special tests. Certain tests require either sodium heparin or lithium heparin. If test requirement is heparinized plasma or whole blood, either may be used.
Note: After tube has been filled with blood, immediately invert tube several times in order to prevent coagulation.

- **Grey-Top (Potassium Oxalate/Sodium Fluoride) Tube:** This tube contains potassium oxalate as an anticoagulant and sodium fluoride as a preservative—used to preserve glucose in whole blood and for some special chemistry tests.
Note: After tube has been filled with blood, immediately invert tube several times in order to prevent coagulation.
- **Lavender-Top (EDTA) Tube:** This tube contains EDTA as an anticoagulant—used for most hematological procedures.
Note: After tube has been filled with blood, immediately invert tube several times in order to prevent coagulation.
- **Blue-Top (Sodium Citrate) Tube:** This tube contains sodium citrate as an anticoagulant—used for collection of blood for coagulation studies.
Note: It is imperative that the tube be completely filled. The recommended proportion of blood to sodium citrate anticoagulant volume is 9:1. Inadequate filling of the collection device will decrease this ratio, and may lead to inaccurate results for calcium-dependent clotting test, such as PT and APTT. Conversely over-filling of collection device will increase this ratio and may lead to clotted specimens or inaccurate results. Immediately after draw, invert tube 5 to 6 times in order to activate anticoagulant.
- **Red-Top Tube:** This tube is a plain VACUTAINER® containing no anticoagulant—used for collection of serum for selected chemistry tests as well as clotted blood for immunohematology.
- **Royal Blue-Top Tube:** There are 2 types of royal blue-top Monoject® tubes—one with the anticoagulant EDTA and the other plain. These are used for collection of whole blood or serum for trace element analysis. Refer to the individual metals in the individual test listings to determine tube type necessary.
- **Serum Gel Tube:** This tube contains a clot activator and serum gel separator—used for various laboratory tests.
Note: Invert tube to activate clotting; let stand for 20 to 30 minutes before centrifuging for 10 minutes. If frozen serum is required, pour off serum into plastic vial and freeze. Do not freeze VACUTAINER® tubes.
- **Special Collection Tubes:** Some tests require specific tubes for proper analysis. Please contact Huntsville Hospital Health System Laboratory Client Services prior to patient draw to obtain the correct tubes for metal analysis or other tests as identified in individual test listings.

Yellow-Top (ACD) Tube: This tube contains ACD—used for collection of whole blood for special tests.

Guidelines for Sending Specimens to the Laboratory via the Tube System

Specimens Acceptable for Transport: Leak-proof containers **must** be used. Leak-proof containers are available through the hospital storeroom. Lids on these containers must be screwed on tightly to avoid leakage. Care should be exercised when deciding to use TransLogic System for specimens that are considered non-recollectable. It is imperative that these specimens are packaged securely and sent to the correct tube station.

Specimens Unacceptable for Transport: All specimens collected in containers that are not leak-proof cannot be transported. Examples of specimen containers and specimens unacceptable for transport include:

- Specimen in trap containers
- Stool in containers with snap on lid
- Syringe
- Specimen in formalin jars

Transport Specimens: Transport specimens as follows:

- Place each specimen in a Biohazard Ziploc® bag. Only **1** patient per bag is recommended.
- For specimens that need to be transported on ice, place bag of ice into a second Ziploc® bag with the specimen and paperwork.
- Paperwork must accompany each specimen. Do not put transmittals in Ziploc® bags with specimens. Place in outside pocket.
- Place bagged specimen and transmittal in **padded** carrier (both sides of carrier). Contents must be packaged in a way that will not allow movement once inside carrier.
- Lock carrier securely.
- Send carrier to appropriate laboratory station.

Leaks: Any specimen that leaks due to improper packaging will be discarded in the laboratory. Laboratory personnel will notify unit to recollect specimen.

Specimens from Physician Offices: Biohazard Ziploc® bags are provided. Please place specimens for only **1** patient per bag and place the request form for this patient in the outside pocket of the bag. Assure the Ziploc® bag is closed properly.

Key Points:

- You can send anything in the tube that weighs less than 17 pounds, with some exceptions for laboratory specimens.
- Packing is important so that contents do not rattle when shaken. Packing is not necessary for sending paperwork.
- All liquids need to be in containers with rubber rings to prevent leakage and the containers need to be in baggies.
- Pack the contents properly. Do not place the carrier in the system without locking it. Also nothing (paper, plastic or packing) is to be sticking out.
- For problems with tube system, call plant operations, ext. 5-2700.

Recommended Patient Instructions for 24-hour Urine Collections

TO THE PATIENT: Follow these instructions in collecting your 24-hour urine specimen.

You will find it more convenient to void (urinate) into the smaller container provided and transfer urine into larger collection bottle. Do not add anything but urine to the bottle and **do not pour out any liquid or powder that may already be in the collection bottle.**

The collection bottle should be kept refrigerated throughout the collection period.

- Upon arising in morning, urinate into toilet, emptying bladder completely. Do not collect this specimen. Note exact time and write it down on container label.
- Collect all urine voided after this time for 24 hours in container provided by physician. All urine passed during the 24-hour time period (day and night) must be saved.
- Refrigerate collected urine between all voiding or keep in a cool place.
- At exactly the same time following morning, void completely again (first time after awakening), and add this specimen to collection container. This completes your 24-hour collection.
- Take the 24-hour specimen to physician's office or laboratory as soon as possible, maintaining the cool temperature in transit by placing specimen in a portable cooler or insulated bag.

Summary: Interference of Medications and Other Substances with 24-hour Urine Tests

Direct drug interference is least likely in blood tests, as drug concentrations are usually very low. However, drugs or their

metabolites frequently are concentrated in the urine in sufficient amounts to interfere significantly with urine assays.

- Drug effects usually cause high values rather than false low values.
- Tranquilizers should be discontinued 48 to 72 hours before urine specimens are collected for steroid studies (17-ketogenic steroids or 17-ketosteroids).
- Coffee, tea, and chocolate should be avoided 48 hours before collection of urine specimens for Vanillylmandelic Acid (VMA). (This interference is method dependent and these restrictions are unnecessary with some VMA methods.)
- Hydroxyindoleacetic Acid (5-HIAA)—Patients should exclude pineapple, walnuts, plums, and tomatoes from their diet prior to and during collection period.
- Drug interference of notable clinical significance has been well documented in the following instances:
 - Thiazide diuretic therapy: pharmacologic or toxic effect is hyperuricemia and hyperglycemia.
 - L-Dopa: interferes with fluorescent assays for catecholamines, resulting in falsely elevated levels. Order VMA or metanephrine instead.
- Since many medications have been shown to have long term residual effects that interfere with testing, patient history is essential prior to testing.
- As a general rule, when there is no danger of risk or serious discomfort to the patient, the College of American Pathologists recommends that medications that might interfere be avoided for at least 4 to 24 hours prior to blood studies and 48 to 72 hours prior to urine studies.