



Specimen Collection

Blood Collection

Blood Banking, Transfusion Services

To prevent patient and/or sample identification errors, and thereby any possible serious intravascular hemolytic transfusion reactions, HML utilizes a “Hollister Identification System”. The “Hollister Identification System” utilizes a positive blood recipient identification system in which a unique key transfusion number is assigned to the patient, the blood specimen and the units of blood. For those locations that may be drawing specimens for Transfusion-related testing, please refer to HML’s complete Policy and Procedure for utilizing the Hollister ID system. Specimens that are submitted for transfusion-related testing that are not labeled using the Hollister ID system will be rejected and require recollection.

Blood Specimens Defined

Most laboratory tests are performed on anticoagulated plasma, serum, or whole blood. In general, specimens should be refrigerated until placed in the courier box 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 blood collection tube by inverting 6-10 times immediately after draw. If required, separate plasma from cells by centrifugation within 20- 30 minutes.
- **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 20-30 minutes. Caution: avoid hemolysis.
- **Whole Blood:** Draw a sufficient amount of blood with the indicated anticoagulant. Gently mix the blood collection tube by inverting 6-10 times immediately after draw.

The following is a list of tubes referred to in Hagerstown Medical Laboratory’s specimen requirements:



• **Green-Top Tube (Lithium or Sodium Heparin):** This tube contains lithium or sodium heparin — used for drawing heparinized plasma or whole blood for special tests. NOTE: After the tube has been filled with blood, immediately invert the tube several times in order to prevent clotting.



• **Grey-Top Tube (Potassium Oxalate/Sodium Fluoride):** 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 the tube has been filled with blood, immediately invert the tube several times in order to prevent clotting.



• **Lavender-Top Tube (EDTA):** This tube contains EDTA as an anticoagulant — used for most hematological procedures. NOTE: After the tube has been filled with blood, immediately invert the tube several times in order to prevent clotting.



• **Light Blue-Top Tube (Buffered Citrate):** This tube contains 0.5 mL of 0.105 M buffered citrate solution with potassium sorbate as an antimycotic agent — used for drawing blood for coagulation studies. NOTE: It is imperative that the tube be completely filled. The ratio of blood to anticoagulant is critical for valid prothrombin time results. Immediately after draw, invert the tube 6-10 times in order to prevent clotting.



• **Pink EDTA Spray-coated Potassium EDTA (plastic).** Must be used for routine immunohematology testing and blood donor screening. Designed with special cross-match label for patient information required by the AABB. Invert the tube several times after draw to prevent clotting.



• **Red-Top Tube:** This tube is a plain collection tube containing no anticoagulant — used for drawing serum for selected chemistry and referral tests.



• **Royal Blue-Top Tube:** There are two types of royal blue-top (dark blue) tubes — One with EDTA anticoagulant and the other plain. These are used in drawing whole blood or serum for trace element analysis. Refer to the individual trace element tests in the Test Catalog to determine the tube type necessary.



• **Gold-top Serum Separator Tube (SST):** This tube contains a clot activator and serum gel separator — used for most chemistry, immunology and some referred laboratory tests. NOTE: Invert the tube to activate the clotting; let stand for 20-30 minutes before centrifuging for 10 minutes. If frozen serum is required, pour off serum into plastic vial and freeze. Do not freeze in the collection tubes.



• **Yellow-Top Tube (ACD):** This tube contains Acid Citrate Dextrose — used for drawing whole blood for special tests.

• **Special Collection Tubes:** Some tests require specific tubes for proper analysis. Please contact Hagerstown Medical Laboratory prior to patient draw to obtain the correct tubes for other tests as identified in the individual test listings.

Body Tissue

The following are used to submit various tissues other than blood and body fluids. Please refer to the Test Catalog for more specific instructions and submission requirements.

- Culture Sterile, black screw-top or sterile cup
- Biopsy Formalin or saline moistened gauze, if formalin submission is questionable

Body Fluid Collection - Refer to HML's separate guide for submitting body fluids for testing.

HML Quick Reference Charts

Listed below are some HML Quick Reference Charts available as separate documents which may assist your specimen collection. Additional information may be found under the individual test listing in the HML on-line Test Catalog.

HML Chemistry Specimen Tube Usage Chart
HML Urine Preservative & Temperature Charts
HML Hematology Time Limits
HML Microbiology Collection Quick Reference Chart

Preparation of Outpatients for Laboratory Testing

Specimens collected at HML PSC's--Outpatients occasionally arrive for testing improperly prepared for their testing. Drawing of their blood could lead to erroneous results which are clinically inapplicable. The majority are either patients who should be fasting (and are not) or arrive at a time inappropriate for therapeutic drug monitoring. If the test is such that phlebotomy under the wrong conditions could result in improper therapy, the patient will be asked to return for testing under proper conditions. See also our Therapeutic Drug Monitoring Guideline for specific information. Under certain circumstances, if the test

is part of a larger profile, the patient will be drawn and the assay performed with a comment noting the inappropriate collection as part of the laboratory report. As always, a patient will be drawn regardless of status if you specifically request it in the written order, but the result may be reported with a disclaimer.

Specimens Collected by Patients

HML has written instructions for patients for specimens they would be collecting. These documents are available for viewing or printing on our website.

Specimen Labeling

Specimens must be labeled exactly the same as the ordering request form with respect to name. The description and the name of a pathology specimen must match exactly on the specimen and the requisition form. Specimens must be labeled with the patient's name, Social Security number or date of birth, the date and time of collection, and the collector's initials. Specimens not properly labeled may not be processed.

Common Sources of Inaccurate Test Results and Unacceptable Specimens

Certain issues with specimen collection make it difficult or impossible to test accurately. Here are some of the common causes:

- ***Hemolysis*** — Hemolysis occurs when the membrane surrounding red blood cells is disrupted and hemoglobin plus other intracellular components escape into the serum or plasma. Hemolyzed serum or plasma varies in color from faint pink to bright red, rather than normal straw color. Grossly or moderately hemolyzed specimens will be redrawn, because even slight hemolysis may alter certain results.
- ***Hyperbilirubinemia (Icteric)*** — Icteric serum or plasma varies in color from dark to bright yellow, rather than normal straw. These specimens will invalidate certain color determinations; a new specimen may be requested.
- ***Turbidity (Lipemia)*** — Turbid, cloudy, or milky sera may be produced by the presence of fatty substances in the blood. A recent meal produces transient lipemia. Therefore, it is generally recommended patients fast 12-14 hours before specimens are drawn.

Specimen Rejection Criteria

All tests are unique in their specimen requirements. To avoid specimen rejection or delayed turnaround times, please check the "Specimen Required" field within each test. You will be notified of rejected or problem specimens upon receipt. Please review the following conditions prior to submitting a specimen to Hagerstown Medical Laboratory:

- Full 24 hours for timed urine collection
- pH of urine
- Lack of hemolysis and lipemia
- Specimen type (plasma, serum, whole blood, etc.)
- Specimen volume

- Patient information requested
- Patient/specimen properly identified
- Specimen container (metal-free, separation gel, appropriate preservative, etc.)
- Transport medium
- Temperature (ambient, frozen, refrigerated)
- Transfusion testing specimen needs Hollister ID labeling