

Specimen Collection and Preparation

Laboratory test results are dependent on the quality of specimen submitted. If there is any doubt or question regarding the type of specimen that should be collected, please contact Palos Community Hospital (PCH) Laboratory to clarify a test request or specimen requirement.

Fasting Requirements

When fasting is required for laboratory testing at PCH the patient should not consume any food or drink except small amounts of water, for the minimum fasting time prior to the specimen being drawn. Minimum fasting time, for lipid testing (lipid profile, high-density lipoprotein, triglycerides) is 12 hours. The minimum fasting requirement for all other tests (such as glucose studies) is 8 hours unless specifically indicated otherwise by the ordering physician. Fasting for tests being sent to reference laboratories would be subject to the requirements of the testing laboratory.

Specimen Labeling

All specimens submitted to the laboratory for testing must be properly labeled. Minimally, all specimens must be labeled with: patient's name, date of birth, and date and time of draw. Inpatient specimens must also include a medical record number and initials or technician code of person procuring the specimen.

Draw Order

When multiple tubes are drawn, it is important to prioritize the drawing order to help prevent contamination. The tube manufacturer recommends the following specific order for the drawing of multiple tubes:

- If a blood culture is ordered, always draw first. By doing so, the possibility of bacterial contamination is decreased.
- Any non-additive serum tube (plain).
- Light blue-top (sodium citrate) tube. When only coagulation studies are ordered, draw a waste tube or an initial blue-top tube and discard before the coagulation specimen is drawn.
- Gold-top serum gel tube or plain, red-top tube with clot activator.
- Green-top (lithium or sodium heparin) or light green-top (lithium heparin gel) tube.
- Lavender-top (EDTA) tube or pink-top (EDTA) tube.
- Any other additive tube.

Blood Collection

Most laboratory tests are performed on anticoagulated whole blood, plasma, or serum. 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:* When plasma is the required specimen, collect blood specimen in the anticoagulated tube specified by the test requirement. Use the proper venipuncture technique and always verify patient identification. Immediately after draw, invert all tubes gently 8 to 10 times to mix anticoagulant with blood. Centrifuge at 3,000 rpm to 3,500 rpm for 10 to 15 minutes. Separate plasma from cells as soon as possible. For non-barrier (non-gel) tubes and tests requiring frozen plasma, remove plasma from cells with plastic pipette. Transfer plasma to plastic transfer tube. Avoid transferring cells with plasma. For barrier tubes requiring a refrigerated plasma specimen, the whole barrier tube, spun and unopened, can be submitted to the laboratory. Send separate transfer tubes (aliquot) for each test ordered when possible. Send separate aliquot for tests that require refrigeration and those that require freezing. Always properly label specimen.
- *Serum:* When serum is the required specimen, draw blood using proper venipuncture technique. Always verify patient identification. Immediately after draw, gently invert all barrier tubes 8 to 10 times to mix clot activator with blood. For all tests requiring serum, allow tubes to clot in a vertical position for 30 minutes. This ensures complete clot formation. An incomplete clot will allow latent fibrin to contaminate serum and inhibit the flow of gel. Centrifuge at 3,000 rpm to 3,500 rpm for 10 to 15 minutes. Immediately remove specimen from centrifuge. In barrier gel tubes, all of the separation gel will have moved from the bottom of tube to form a barrier layer separating cells from serum. If test requires a refrigerated specimen, the whole barrier tube, spun and unopened, can be submitted to laboratory. For non-barrier tubes and tests requiring frozen serum, remove serum from cells with plastic pipette. Transfer serum to plastic transfer tube. Send separate transfer tubes (aliquot) for each test ordered when possible. Also, send separate aliquot for tests that require refrigeration and those that require freezing.

Note: Testing for therapeutic drugs, drug of abuse screens, and most serology tests require that they

be drawn in plain, red-top tubes (**no gel barrier**). The gel in the barrier may interfere with test results. For best results on all blood specimen testing, separate serum from cells and refrigerate or freeze as soon as possible. Always properly label specimen.

- **Whole Blood:** When whole blood is the required specimen, draw blood in the anticoagulated tube specified by test requirement. Use the proper venipuncture technique and always verify patient identification. Immediately after draw, invert tubes gently 8 to 10 times to mix anticoagulant with blood. Do not open tube, do not transfer. Refrigerate specimen if required. Specimen is ready to be transported to the laboratory.

Specimen Collection Tubes

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

- **Gold-Top Serum Gel Tube:** This tube is a clot activator and serum separator—used for most routine chemistry testing.
Note: After tube has been filled with blood, gently invert tube 8 to 10 times to activate clot formation.
- **Green-Top (Lithium Heparin) Tube:** This tube contains lithium heparin—used for drawing lithium heparin plasma or whole blood for special tests.
Note: After tube has been filled with blood, gently invert tube 8 to 10 times to prevent coagulation.
- **Green-Top (Sodium Heparin) Tube:** This tube contains sodium heparin—used for some heparinized plasma or whole blood draws.
Note: After tube has been filled with blood, gently invert tube 8 to 10 times 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.
Note: After tube has been filled with blood, gently invert 8 to 10 times 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, gently invert tube 8 to 10 times to prevent coagulation.
- **Light Blue-Top (Sodium Citrate) Tube:** This tube contains sodium citrate as an anticoagulant—used for coagulation studies.

Note: It is imperative that the tube be completely filled. The ratio of blood to anticoagulant is critical for valid coagulation test results. Gently invert tube 8 to 10 times to prevent coagulation.

- **Light Green-Top (Lithium Heparin Gel) Tube:** This tube contains lithium heparin anticoagulant and separation gel—used for most heparinized plasma draws, such as electrolytes.
Note: After tube has been filled with blood, gently invert tube 8 to 10 times to prevent coagulation.
- **Pink-Top (EDTA) Tube:** This tube contains EDTA as an anticoagulant—used for Blood Bank testing.
Note: After tube has been filled with blood, gently invert tube 8 to 10 times to prevent coagulation.
- **Plain, Red-Top Tube:** This tube contains a clot activator—used most for drug and serology testing since these tests require that a gel barrier tube **not** be used. Can also be used for most chemistry tests.
Note: Serum must be promptly removed from cells. Gently invert tube 8 to 10 times to activate clot formation.
- **Royal Blue-Top Tube:** There are 2 types of royal blue-top Monoject® tubes—1 with the anticoagulant EDTA and the other plain. These are used for drawing of whole blood or serum for trace element analysis. Refer to individual metals in individual test listings to determine tube type necessary.
Note: After tube has been filled with blood, gently invert tube 8 to 10 times to prevent coagulation.
- **Special Collection Tube:** Some tests require specific tubes for proper analysis. Please contact PCH to determine and obtain correct tube(s).

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 Preservative” 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 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.

If delays are anticipated in sending specimen to the laboratory, a portion of the specimen should be aliquoted into a grey urine culture transport tube (boric acid) should any culture work also be desired or indicated.

Mediatech LIS Markers

There are situations when special instructions are to be followed prior to drawing a patient. These markers print on the Mediatech specimen collection label or under special instructions in the Lattice system. The most commonly used LIS markers are...

BBCALL Call Blood Bank before drawing.

LAVBB Draw lavender tube for Blood Bank

HECALL Call Hematology for instructions before drawing

PLC Platelet Clumper-Draw pre-warmed lavender and blue top tubes. Specimen must be kept warmed and delivered as soon as possible to Hematology

PLCU Platelet Clumper with Unopettes-Draw pre-warmed lavender and blue top tubes and 2 unopettes. Specimen must be kept warmed and delivered as soon as possible.