

Specimen Collection, Preparation, and Transportation

Laboratory test results are dependent on the quality of the specimen submitted. It is important that all specimens and requisition forms be properly labeled with the name of the patient, collection date, and the origin (source) of the specimen, when applicable. Heart of the Rockies Regional Medical Center Laboratory (HRRMC) Specimen Identification Policy states that all specimens received for testing must be correctly and adequately labeled to assure positive identification. Specimens must have 2 person-specific identifiers on the patient label. Person-specific identifiers may include: patient's first and last name, unique identifying number (eg, social security number), or date of birth. Specimens are considered mislabeled when there is a mismatch between the person-specific identifiers on the specimen and information accompanying the specimen (eg, computer system, requisition form, additional paperwork). When insufficient or inconsistent identification is submitted, HRRMC laboratory will recommend that a new specimen be obtained, if feasible.

If there is any question regarding the type of specimen that should be collected, it is important that HRRMC Laboratory be called at 719-530-2260 to clarify the order and specimen requirements.

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:** Draw a sufficient amount of blood with indicated anticoagulant to yield necessary plasma volume. Gently mix blood collection tube by inverting 6 to 10 times immediately after draw. If required, separate plasma from cells by centrifugation within 20 to 30 minutes.
- **Serum:** Draw a sufficient amount of blood to yield necessary serum volume. Allow blood to clot at ambient temperature. Then, separate serum from clot by centrifugation within 20 to 30 minutes. Caution: avoid hemolysis.
Note: Some tests require serum to be separated from the cells within 2 hours of draw.
- **Whole Blood:** Draw a sufficient amount of blood with indicated anticoagulant. Gently mix blood collection tube by inverting 6 to 10 times immediately after draw.

Specimen Collection Tubes

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

- **Green Top (Sodium Heparin) Tube:** This tube contains sodium heparin—used for collection of sodium heparin plasma or whole blood for special tests.
Note: After tube has been filled with blood, immediately invert several 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 and for some special chemistry tests.
Note: After tube has been filled with blood, immediately invert several 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, immediately invert several times to prevent coagulation.
- **Light-Blue Top (Sodium Citrate) Tube:** This tube contains sodium citrate as an anticoagulant—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 tube 6 to 10 times to activate the anticoagulant.
- **Light-Green Top (Lithium Heparin Gel) Tube:** This tube contains lithium heparin anticoagulant and separation gel—used for various laboratory tests.
Note: After tube has been filled with blood, immediately invert several times to prevent coagulation.
- **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—1 with the anticoagulant EDTA and the other plain. These are used for collection of whole blood or serum for trace element analysis. Refer to individual metals in 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(S).

- ***Special Collection Tube***: Some tests require specific tubes for proper analysis. Please contact HRRMC Laboratory at 719-530-2260 prior to patient draw to obtain correct tubes for metal analysis or other tests as identified in individual test listings.
- ***Yellow Top (ACD) Tube***: This tube contains ACD—used for drawing whole blood for special tests.

Recommended Order of Blood Draw

- Blood culture tubes or vials
- Coagulation tubes (blue top tubes)
- Serum tubes with or without clot activators or gel (red, gold, or speckle top tubes)
- Heparin tubes (green top tubes)
- EDTA tubes (lavender top tubes)
- Oxalate/fluoride tubes (gray top tubes)

Specimen Centrifugation

Centrifuge carriers and inserts should be of the size specific to the tubes used. Use of carriers too large or too small for the tube may result in breakage. Ensure that tubes are properly seated in the centrifuge carrier. Tubes extending above the carrier could catch on the centrifuge head, resulting in breakage. Balance tubes to minimize the chance of breakage. Match tubes to tubes of the same fill level, glass tubes to glass tubes etc.

If the tubes require centrifugation, spin for 10 minutes at 3,500 rpm unless otherwise instructed. If the specimen is to be centrifuged, do not stop the centrifuge once started; interrupting the process may degrade the specimen integrity. Always allow the centrifuge to come to a complete stop before attempting to remove tubes. When centrifuge head has stopped, open the lid and examine for broken tubes. If broken, use mechanical device such as forceps or hemostat to remove tubes.

Note: Do Not remove broken tubes by hand.

Histology Specimens

Routine specimens submitted to histology for tissue processing:

- Specimen container and requisition must include:
 - Patient full legal name
 - Type of tissue
 - Body site
 - Collection date
 - Physician
 - Patients date of birth

- The requisition must also include the physicians signature, billing information, and any previous history of malignancy
- Specimens received for routine histological examination must be submitted in 10% neutral buffered formalin. Prefilled containers with 10% formalin are provided to doctor's offices
- Transport specimen at ambient temperature

Renal Stones Submitted to Histology for Tissue Processing:

- Send stone to histology with no fixative (Do not submit in formalin)
- Specimen container and requisition must include:
 - Patient full legal name
 - Type of tissue
 - Body site
 - Collection date
 - Physician
 - Patients date of birth
- The requisition must also include the physicians signature, billing information, and any previous history of malignancy

Fine Needle Aspiration

- Collection/Transport supplies (provided by HRRMC Histology Department)
 - Glass Slides
 - Conical tubes with CytoLyt preservative (blue capped)
 - Cell Fixx fixative Spray (acid alcohol fixative spray)
 - Slide holders
 - Specimen bags
 - Labels for the specimen bags
 - Cytology Requisitions
 - Hazard labels for tubes
 - RPMI media (contact lab for media as needed) (Recommended if lymphoma is suspected)
- Specimen Handling
 - Optimal sampling to be sent to histology includes approximately equal number of acid alcohol spray-fixed slides AND air dried slides (non-fixed). It is acceptable for the number to be less or more of either. Indicate on slides which slides are spray-fixed and which slides are air-dried (unfixed).
 - Usual slide number is somewhere between 6 and 12 slides, total

- Excess sample, sample retained in hub of needle (needle rinse), or cyst fluid: may be expressed into the conical tube with CytoLyt (blue capped) for possible cell block and thin layer preparation
- If lymphoma is suspected, recommend following the steps below, and then also add specimen to RPMI media for possible flow cytometry testing
- Specimen Preparation (Smear preparation)
 - Prepare slides from needle sample, Prepare **Cell-Fixx slides AND air-dried (nonfixed) slides**:
 - Spray-fixed slides: Spray-fix slides immediately (within 2 seconds of collection) with Cell Fixx Solution/Spray
 - Air-dried slides: Smear specimen onto slide and let smear air dry, without any fixative
 - Label appropriate slides as air dried slides or Cell-Fixxed slides
 - Label all slides with the patients name, date of birth and sample type (ie thyroid, breast)
 - Label all conical tubes with the patients name, date of birth and sample type (ex thyroid, breast etc.)
 - Place air dried slides in slide holder when dry
 - Place spray- fixed slides in slide holder when dry.
 - Remainder of sample, sample retained in needle hub (needle rinse), or cyst fluid: sample expressed as a needle rinse into CytoLyt fluid (blue cap) conical tube.
 - Complete Cytology requisition with all patient demographics, insurance information, pertinent history, radiologic findings and a diagnosis.
 - Include all providers who need a copy of the final results. Also include fax number if not a local provider
 - Place CytoLyt conical tubes (blue-capped) and RPMI tube (if indicated) into a specimen bag
 - Place air dried slides and spray-fixed slides and completed requisition into a second bag for transport
 - Be sure all tubes and slides are labeled with patient name, DOB, and source site.
 - Send to HRRMC Histology Department ASAP. Call if a courier is needed

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.

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.

Please call with any questions regarding specimen collection or fixation 719-530-2260 ext 2195

Urine Collection—Mayo Medical Laboratories

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