Specimen Collection and Preparation

Test results are dependent on the specimen quality. Specimens and request slips must be labeled with patient's name, medical record number or date of birth, collection date, and specimen source, when applicable.

To ensure identification, every Mayo request slip has pre-numbered specimen labels which provide unique patient identification.

The most common interfering substances are listed on the specimen requirement column of the test listing. A more comprehensive listing is available in Young DS: Effects of Drugs on Clinical Laboratory Tests. 4th edition. Washington DC, AACC Press, 1995.

If there is any question regarding specimen type that should be collected, call TidalHealth Peninsula Regional (410-543-7386) to clarify the specimen requirements.

Blood Collection

ORDER OF DRAW

Blood Cultures
Plain Red
Blue
Gold or Red Tiger
Green
Lavender/Pink
Gray
Other Additives

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 mins.
- ***Serum*** Draw 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 mins. Caution: avoid hemolysis.
- ***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.

Coagulation Studies

- Coagulation study tubes contain 3.2% solution/0.105 Molar sodium citrate. Tubes containing 3.8% solution/0.129 Molar sodium citrate cannot be used.
- Ratio of anticoagulant to blood is important; a specimen drawn for coagulation studies is unacceptable if tube is not filled to 90% capacity.
- A non-hemolyzed specimen is absolutely essential for accurate results; hemolyzed plasma cannot be used.
- Tubes drawn for coagulation studies should be mixed by gentle inversion; avoid vigorous agitation as hemolysis may occur.
- Heparinized syringes should never be used for coagulation studies; heparin has an inhibitory effect causing prolonged clotting times.
- Deliver to laboratory as soon as possible. Specimen must be received within 8 hrs of draw.

Definitions of Priorities of Specimen Collection

- ***STAT*** Specimen will be collected as soon as possible. Results will be reported via computer or telephone as data is available. There is a surcharge for this service. Most laboratory tests can be run on a STAT basis. However, it is recognized that those tests will not cover all medical situations, and that occasionally other tests may be required on a STAT basis. When this is the case, it is requested that attending physician or staff personnel consult with a pathologist or a laboratory supervisor to determine whether laboratory can provide additional STAT service.
- ***Timed Request*** Specimens to be collected at a future time and processed STAT. Requests must be entered into HIS at least 45 minutes prior to desired collection time. There is no surcharge for this service.
- ***Routine*** Specimens to be collected between 0400 and 0700.
- ***Next Collection Time*** Specimen to be collected within the hour after being requested. Reported the same as routines.

Labeling of Specimens for Laboratory Testing

See "Labeling of Specimens for Laboratory Testing" in "Special Instructions."

Specimen Collection Tubes Available

- ***Dark Green-Top (Sodium Heparin) Tube:*** This tube contains sodium heparin—used for drawing heparinized plasma or whole blood for special tests and for NH_3. After tube has been filled with blood, immediately invert several times in order to prevent coagulation.
- ***Gold-Top (Serum Gel and Clot Activator) Tube*:** This tube contains a clot activator and serum gel separator— used for various laboratory tests. Invert tube to activate clotting; let stand for 20-30 mins or until clotted before centrifuging for 10 mins. If frozen serum is required, pour off serum into plastic vial and freeze. Do not freeze VACUTAINER tubes.
- ***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 tests. 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 hematology procedures. After tube has been filled with blood, immediately invert tube several times to prevent coagulation.
- ***Light Blue-Top (3.2% Sodium Citrate) Tube*:** This tube contains sodium citrate as an anticoagulant—used for collection of blood for coagulation studies. It is imperative that tube be filled to 90%. Ratio of blood to anticoagulant is critical for valid prothrombin time results. Immediately after draw, invert 6-10 times to activate anticoagulant.
- ***Light Green-Top (Lithium Heparin) Tube*:** This tube contains a plasma gel separator. Used for ionized calcium as well as other chemistries. After tube has been filled with blood, invert several times to prevent coagulation.
- ***Pink-Top (K2 EDTA) Tube*:** This tube contains K_2 EDTA as an anticoagulant—used for Transfusion Services. After filling tube with blood, immediately invert several times to prevent coagulation.
- ***Plain, Red-Top Tube*:** This tube is a plain VACUTAINER containing no anticoagulant—used for drawing serum for selected chemistry tests as well as clotted blood for immunohematology.
- ***Red and Black Tiger-Top Serum Gel Tube***: This tube contains a clot activator and serum gel separator—used for various tests. Invert tube to activate clotting; let stand for 20-30 mins or until clotted before centrifuging for 10 mins. If frozen serum is required, pour off serum into plastic vial and freeze. Do not freeze VACUTAINER.

- ***Royal Blue-Top Tube:*** There are 2 types of royal blue-top Monoject® tubes—1 with anticoagulant EDTA and the other plain. These are used in drawing whole blood or serum for trace element analysis. Refer to the individual metals in the individual test listings to determine tube type necessary.
- ***Special Collection Tubes*:** Some tests require specific tubes for proper analysis. Please contact TidalHealth Peninsula Regional prior to patient draw to obtain correct tubes for metal analysis or other tests as identified in the individual test listings.
- ***Yellow-Top (ACD) Tube*:** This tube contains ACD—used for drawing whole blood for special tests.

Specimen for Cytology

- Follow detailed instructions in specimen requirements for collection of each specimen type. Check the appropriate block of the "Cytology Request Form" for material submitted. If specimen type is not listed, check "OTHER" and write in the type. Complete entire form. Do not write in diagnostic space of the "Cytology Request Form."
- Specimen containers, ThinPrep® vials, and other cytology collection Supplies are available from Histology at 410-543-7386 ext.4928.
- All cytology specimens clocked in before 1430 on Mon-Fri will be processed that day. Any cytology specimen that is clocked in after 1430 Mon-Thu will be processed the next day. Specimen must be kept refrigerated until processing. Any specimen received after 1430 on Fri will be processed on Mon.

Specimen for Microbiology

Specimen must be collected in screw-capped, sterile container (except stools). Specimen should be brought to laboratory as soon as possible. Make sure request form is completely filled out and includes following:

- Two patient identifiers (patient's full name and either medical record number and/or date of birth)
- Date and time of collection
- Specimen source
- Collector's name
- Any other information which might be helpful in culturing or evaluating specimen. For example, preliminary diagnoses, any antibiotic administered to patient prior to collection, character of wounds (i.e., superficial or deep, clean or contaminated). A

telephone call at 410-543-7386 ext.4227 advising laboratory of any extraordinary requests will go a long way towards preventing any subsequent misunderstandings.

Urine Collection

24-Hour Urine Collections: Mayo 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.
- By using a P-Splitter urine collection device, it is possible to collect, during a 24-hour period, specimens for multiple urine tests which require different or no preservative. If a physician's order indicates need for a collection of 2 or more 24-hour urine tests, call 410-543-7386 ext.4222 to get a P-Splitter container.
- ***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 tube.

Specimen Quality and Integrity

A test is of little or no value to the physician if it is not properly ordered, collected, and processed in a timely manner. When a specimen has to be recollected because of improper ordering or handling, this may delay treatment of patient and thus add to cost of health care. The following guidelines give necessary requirements to ensure testing will be done in a timely manner.

- Laboratory reserves right to reject any and all specimens that are not properly identified. This includes specimens with questionable identification, no label, or with labels from 2 different patients. One exception is cord blood from newborns which must have both mother's and baby's label.
- Laboratory reserves right to reject any unsatisfactory specimens that have been collected or handled improperly. This includes specimens in syringes with needles attached, leaky containers, or with loose tops. Transport tube (boric acid) should a culture be desired or indicated.

A Few Tests that Require Advance Scheduling

- Bone Marrow Aspiration (This test must be scheduled at least 24 hrs in advance. Call Point of Care at 410-543-7386 ext.7387 to schedule test.)
- After scheduling, send a written TidalHealth "Laboratory Request Form" to laboratory stating test and date and time test is scheduled for.

Notes

- When manual states a test is "performed" on a specific day/time, it means that laboratory runs that test on that day/time.
- Hundreds of tests not listed in this manual are available. If you do not see test in this manual, call 410-543-7386