

Specimen Collection and Preparation

Patient/Specimen Identification

Proper specimen collection, handling, and requisition completion, as appropriate, are an essential part of obtaining valid, timely laboratory test results. All test requisitions and specimens delivered to the laboratory must meet the defined criteria for identification, collection, quality, volume, and testing in order to be processed. Specimens must be submitted in appropriately labeled and well-constructed containers, with secure lids to prevent leakage during transport. Clients will be notified of rejected or problem specimens upon receipt.

The Joint Commission of Accredited Healthcare Organizations (JCAHO) safety goals require that 2 patient identifiers be used to identify a patient prior to performing any medical procedure. This identification requirement is extended to the labeling of specimens and is required. Those specimens received which have incomplete or ambiguous identification may not be processed until the discrepancies have been reconciled. In these situations, the laboratory will contact either the hospital unit or the referring physician's office.

Specimen Collection Tubes Available

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

- **Green-Top Tube (Heparin)**: This tube contains lithium or sodium heparin—used for the collection of heparinized plasma or whole blood for special tests.
Note: After tube has been filled with blood, immediately invert tube several times in order to prevent coagulation.
- **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 tube has been filled with blood, immediately invert tube several times in order to prevent coagulation.
- **Lavender-Top Tube (EDTA)**: This tube contains EDTA K3 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.

- **Light Blue-Top Tube (Sodium Citrate)**: This tube contains sodium citrate as an anticoagulant—used for collection of blood for coagulation studies.

Note: It is imperative that tube be completely filled. The ratio of blood to anticoagulant is critical for valid prothrombin time results. Light blue-top tubes come in a variety of styles and anticoagulant ratios. The hematology department uses a tube with a 9:1 ratio. It is important that all tubes received in the Hematology Department have the same ratio. Immediately after draw, invert tube 6 to 10 times in order to activate anticoagulant.

If collection is performed using a butterfly needle please attach a syringe to tubing and then fill blue-top tube from syringe. This will prevent under-filling tube and possible specimen rejection.

- **Pink-Top Tube (K₂ EDTA)**: This plastic tube contains K₂ EDTA as an anticoagulant—used for most blood bank procedures.
Note: After tube has been filled with blood immediately invert tube several times in order 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 in collection of whole blood or serum for trace element analysis. Refer to individual metals in the individual test listings to determine tube type necessary.
- **Serum Separator Tube (SST®)**: This tube contains a clot activator and serum gel separator—used for various laboratory tests.
- **Special Collection Tubes**: Some tests require specific tubes for proper analysis. Please contact the laboratory prior to patient draw to obtain correct tubes for metal analysis or other tests as identified in the individual test listings.
- **Yellow/Red-Top Tube**: This tube contains sodium EDTA and ascorbic acid—refer to individual metals in the individual test listings.
- **Yellow-Top Tube (ACD)**: This tube contains ACD—used for collection of whole blood for special tests.

Labeling Specimen

The patient's first and last name, and medical record number are the minimum acceptable patient identification data required on inpatient specimens. Surgical specimens must also be labeled with specimen source and the surgeon's name. Microbiology specimens must include the specimen source on the label. All collection containers must be labeled, not merely the lid or the bag in which the specimen is placed.

All specimens submitted to the laboratory for testing must be appropriately labeled. The following information **must** be on each specimen:

- Inpatients:
 - Patient's name (first and last)
 - Medical record number
 - Date and time of collection
 - Collector's initials or tech code
- Outpatients:
 - Patient's name (first and last)
 - Second patient identifier (for example, birth date or Social Security number)
 - Date and time of draw
 - Collector's initials

Blood Bank Labeling

The Department of Pathology uses the BloodLoc™ System when collecting specimens used in the Blood Bank. The importance of the BloodLoc™, arm banding system should be emphasized to the patients whenever possible. This system has been demonstrated to improve blood transfusion safety. The patient will be required to wear an arm or leg band, containing the BloodLoc™ code.

FASC, MWH, and SH presurgical patient's blood bank orders can be performed up to 10 days prior to surgery provided the patient has no history of a blood transfusion or a pregnancy over the past 3 months. The phlebotomist (hospital or outreach) will have the patient complete the "Pre-Admission Testing Questionnaire." If the patient has had a transfusion or been pregnant during the last 3 months, if no history can be obtained, if the information provided is inconclusive, if the patient is unsure or confused, or if the surgery date is greater than 10 days, the patient will be instructed to return 24 to 72 hours prior to their surgery.

A laboratory associate will take paperwork and armband (with BloodLoc™ code attached) to patient access where they will fill out and sign the "Physician Paperwork Log-In Sheet" in the "Orders Sign-In Log." FASC patient armbands are delivered to FASC.

AFB Culture and Smear Collection Procedure

Test performed at Commonwealth of Virginia Division of Consolidated Laboratory Services (DCLS), Richmond, VA. Direct smear exam for presence of acid-fast bacilli is performed upon receipt at DCLS. Positive smear and/or positive *Mycobacterium tuberculosis* culture reports are phoned directly to the Microbiology Department. In turn, the Microbiology Department notifies infection control and the floor RN and/or physician ASAP. Susceptibility testing is routinely performed only for *Mycobacterium tuberculosis* isolates by DCLS.

Note: The Microbiology Laboratory routinely performs AFB smear requests for bronchial brush slides collected by endoscopy only. All other smear requests are submitted to DCLS. Refer to:

Specimen Types

- Sterile body fluids (CSF, body fluids, urine, blood)
- Lower respiratory tract (bronchial washings (BW)/lavages (BAL), transtracheal aspirates, sputum)
- Wound/aspirates (wound and skin lesion, aspirates or swabs)
- Tissue
- Stool
- Gastric aspirates

Specimen Requirements

1. Lower respiratory tract specimens (sputum, BW, BAL, tracheal aspirates):
 - a. Sterile, leak proof screw-capped container.
 - b. Indicate if single specimen is to be shared by multiple departments (ie, chemistry, hematology).
 - c. Label container with patient's name (first and last), Social Security number or date of birth (inpatients: medical record number), date and time of collection, collector's initials, and type of specimen.
2. Sterile body fluids:
 - a. Sterile container or syringe (provided the needle is removed prior to transport).
 - b. Indicate if single specimen is to be shared by multiple departments (ie, chemistry, hematology).
 - c. Label container with patient's name (first and last), Social Security number or date of birth (inpatients: medical record number), date and time of collection, collector's initials, and type of specimen.

3. Wound/skin aspirates:
 - a. Culturette® swab or syringe (provided the needle is removed prior to transport).
 - b. Label container with patient's name (first and last), Social Security number or date of birth (inpatients: medical record number), date and time of collection, collector's initials, and type of specimen.
4. Wound swabs:
 - a. Culturette® swab.
 - b. Label container with patient's name (first and last), Social Security number or date of birth (inpatients: medical record number), date and time of collection, collector's initials, and type of specimen.
5. Tissue:
 - a. Submit specimen in leak proof, screw-capped container.
 - b. Indicate if single specimen is to be shared by multiple departments (ie, chemistry, hematology).
 - c. Label container with patient's name (first and last), Social Security number or date of birth (inpatients: medical record number), date and time of collection, collector's initials, and type of specimen.
6. Fecal specimens:
 - a. Submit specimen in clean, leak proof container without preservative or diluent.
 - b. Label container with patient's name (first and last), Social Security number or date of birth (inpatients: medical record number), date and time of collection, collector's initials, and type of specimen.
7. Urine:
 - a. Collect first morning specimen on 3 consecutive days. Only collect and submit 1 specimen per day.
 - b. Refer to urine culture collection procedure.
 - c. Label container with patient's name (first and last), Social Security number or date of birth (inpatients: medical record number), date and time of collection, collector's initials, and type of specimen.
8. Blood or bone marrow:
 - a. Collect 5.0 mL (minimum volume: 1.5 mL) in a green-top (sodium heparin) tube(s).
 - b. Label container with patient's name (first and last), Social Security number or date of birth (inpatients: medical record number), date and time of collection, collector's initials, and type of specimen.
9. Gastric aspirate: deliver to laboratory ASAP
10. Respiratory tract:
 - a. **First-morning** specimen is preferred.
 - b. Patient should rinse or gargle with water prior to collection, to avoid collecting sputum contaminated with food or saliva.
 - c. Have patient collect from deep cough. Submit to the laboratory ASAP.
11. Tissue: do not allow specimen to dry out; moisten with sterile distilled water if not bloody.
12. Fecal: contamination with urine should be avoided. Refer to "Stool Specimen Collection Procedure."
13. Urine:
 - a. Do not submit 24-hour urine specimens.
 - b. **First-morning** specimen is recommended.
14. Wound/skin lesions:
 - a. An aspirate is the specimen of choice.
 - b. The skin should be cleansed with 70% alcohol before aspiration of the material into a syringe.
 - c. If insufficient volume for aspiration, pus and exudates may be obtained by Culturette® swab.
 - d. Return swab(s) to tube(s) to ensure specimen preservation (sponge material at bottom of swab containing transport liquid).
 - e. Dry swab is not acceptable.

Recommended Volume		
Special Instructions, ie, Fasting, Clinical Information		
Specimen Type	Minimum Volume	Optimal Volume
CSF	m1.0 mL	Optimal 3.0 mL
Body fluids minimally	m2.0 mL	Optimal m10-15 mL
Blood	1.5 mL	5.0 mL
Respiratory tract	>1.0 mL	Optimal 10 mL
Urine	m10 mL	Optimal >10 mL

Transportation Temperature

Submit specimen to the laboratory ASAP at room temperature except urine. Submit urine specimens to laboratory ASAP, refrigerated.

Normal Values

(Include toxic levels or critical values) Interpretive report

Day(s) Test Set-up

Specimens submitted to DCLS Monday through Friday.

Outreach Supplies

Please call 540-741-2725 Monday through Friday between the hours of 7:00 a.m. and 5:30 p.m. to request supplies.

Inpatient Supplies

The Department of Pathology provides the following supplies to nursing units on request:

- **Microbiology:** Mini-tip Bordetella collection swabs, blood culture bottles - All nursing units
- **Chemistry:** 24-Hour urine containers and special additive tubes - All nursing units
- **Blood Bank:** BloodLoc™ Codes - Operating rooms, same day surgery
- **Point of Care:** ACT tubes - Cardiac care center
Pregnancy test quality control- All nursing units

Requisitions

All requisitions must be completely filled out in order to process patient specimens without delay. Requisitions should include the following information:

- Patient's name (first and last)
- Age
- Sex
- Race (anatomic specimens only)
- Hospital location
- Medical record number (if applicable)
- Hospital account number
- Date and time of collection
- Collector's initials
- Specimen source (if applicable)
- Ordering physician's/surgeon's name (if other than attending physician/surgeon)
- Requesting physician's/surgeon's signature (anatomic pathology and cytology only)
- Test(s) requested
- Diagnosis/clinical history
- ICD-9 code-numeric (outpatients)
- Last menstrual period (anatomic pathology and cytology GYN specimens only)
- Time of last dose (therapeutic drug monitoring)
- Anticoagulant therapy noted (if applicable)

Test Requirements

All tests are unique in their testing 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:

- Full 24 hours for timed urine collection
- Lack of hemolysis/lipemia
- Patient information requested
- Patient/specimen properly identified
- Specimen container type
- Specimen type (plasma, serum, whole blood, etc.)
- Specimen volume
- Transport medium
- Temperature (ambient, frozen, refrigerated)

Specimen Packaging and Courier Services - Outreach

Courier services are available for transporting specimens (ambient, refrigerated, or frozen) to the Department of Pathology and Laboratory Medicine. Special courier services will be provided if appropriate arrangements can be made. Pickup frequency is determined by request, referral volume and/or location. Please contact our Customer Service Department at 540-741-3415 to discuss your needs.