**Pathology and Laboratory Medicine Service**

VA Medical Center

Lexington, Kentucky

This procedure manual was developed by Pathology and Laboratory Medicine Service VA Medical Center Lexington, KY.

Revisions must be approved by the Chief, Pathology and Laboratory Medicine Service.

**The parent document is stored at this network location:**

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| **PATHOLOGY AND LABORATORY MEDICINE SERVICE** |
| VA MEDICAL CENTER LEXINGTON, KENTUCKY |

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# GENERAL POLICIES AND PROCEDURES

## GENERAL INFORMATION

The Pathology and Laboratory Medicine Service organizational unit consists of two physically separated facilities and all ancillary testing sites.

1. Cooper Drive Division

Located on the first floor of the VA Medical Center, Cooper Drive Division, 1101 Veterans Drive, Lexington, KY.

The Cooper Drive Division laboratory facility offers a wide range of services in support of acute, intermediate, long term, and outpatient medical and surgical care. Essential laboratory service is available 24 hours per day, seven days per week. Full laboratory service is provided 7:00 AM to 4:30 PM Monday through Friday (excluding holidays).

If a laboratory service is not normally available, but is needed for emergent reasons, the physician should contact the ‘on-duty’ laboratory supervisor for an assessment of the lab’s capability for performing the special procedure. Tests, other than those generally available, may be performed if personnel and equipment resources are available. However, the laboratory director (or designee's) approval may be required prior to rendering the service.

Special Reference Laboratory (SRL) for Selected Serologic Studies

This laboratory is a special section of the clinical laboratory and is the only one of its kind in the VA system. The SRL performs specialized tests for all VA facilities in the United States. The lab is located on the first floor of the Cooper Drive Division, room A-139, telephone ext. 4838 (adjacent to the clinical laboratory).

1. Leestown Division

Laboratory specimen collection, processing, and transport sites, primarily serving Lexington VAMC outpatients, are located in the basement of Building #1 room 16 and in the basement of Building #16, Room 9 on Leestown Road. These areas are open 8 AM to 4:20 PM, Monday through Friday (closed for all recognized holidays). All specimens collected at the Leestown laboratories are transported to the Cooper Drive Division for testing.

1. Ancillary Testing Sites

A number of Ancillary Testing Sites perform tests for diagnosis, monitoring, and other patient care purposes and are under the quality management oversight of the Chief, Pathology and Laboratory Medicine Service. An Ancillary Testing Coordinator is appointed, by the service chief, to act as technical supervisor for all of these sites. Ancillary sites exist throughout the Cooper Drive Division, Leestown Division, Somerset Community Based Outpatient Clinic (CBOC) Morehead CBOC, Berea CBOC and Hazard CBOC.

## LABORATORY SECURITY

To maintain security in the laboratory at the Cooper Drive Division, all doors are secured from 6:00 PM to 6:30 AM. During the secure interval, admission may be requested by using the buzzer and intercom system available by the double-door entrance to room B102 (by the service elevator).

## QUALITY CONTROL AND LABORATORY ACCREDITATION

Quality control in the clinical laboratory is a surveillance and corrective action process in which methods, equipment, and materials are periodically monitored and systematically adjusted to support optimum lab test precision and accuracy. The quality control record provides evidence that laboratory test methods perform within satisfactory limits and it documents corrective action taken to sustain acceptable analytical processes.

Quality control is an integral part of the day-to-day operations of the laboratory. The Chief of Pathology and Laboratory Medicine Service is responsible for the general oversight and direction of the laboratory’s quality control program. The practical application of the program’s responsibilities is delegated to each of the clinical and anatomic sections of the laboratory. Section Directors (pathologists) and section supervisors are responsible for developing and applying criteria to assure that the precision and accuracy of all analytical methods meet or exceed accrediting agency requirements.

Pathology & Laboratory Medicine Service directs significant personnel and financial resources toward quality control of its processes. The following measures are taken to achieve an assurance of quality:

1. Only qualified personnel, as detailed by position description requirements, are assigned to work in the laboratory sections.
2. Personnel strive to ensure the identity, integrity, and suitability of specimens submitted for analysis.
3. Up-to-date equipment is used and exhaustive preventive maintenance is performed by P&LMS and Engineering Service technical staff and laboratory instrument service technicians. Reagents and controls are appropriate for the testing performed and are properly stored and used within the expiration date set by the manufacturer.
4. The Section Directors and Section Supervisors conduct ongoing review of all technical procedures to ensure they are current and satisfy laboratory accreditation requirements.
5. P&LMS Procedures remain current through active participation in patient care activities, continuous search of current literature for new and improved procedures, and participation in continuing education workshops and seminars.
6. Laboratory reports are viewable in the VistA/CPRS patient record immediately upon verify/release. The “verify/release” process is performed by a qualified member of Pathology & Laboratory Medicine Service (a laboratorian holding the LRVERIFY VistA/CPRS security key). Supervisory personnel perform follow-up review of laboratory reports, at specified intervals, for appropriateness, accuracy, and conformity to laboratory policies.
7. The laboratory is inspected and/or accredited by the following:
   1. The College of American Pathologists (CAP) Laboratory Accreditation Program (LAP). The service also participates in the CAP Proficiency Survey Program; an external audit and peer comparison system. The laboratory complies with the CAP terms of accreditation which includes notification of:

* Investigation by a government
* Adverse media attention related to lab performance
* Change in test menu
* Change in location or directorship
* Other unexpected changes which might affect accreditation status
  1. The Food and Drug Administration
  2. Joint Commission for the Accreditation of Healthcare organizations

## TESTS PERFORMED OUTSIDE OF THE VA MEDICAL CENTER

The VistA/CPRS LABORATORY TEST file configuration for tests referred to outside laboratories is modeled after test library information obtained directly from the reference laboratory. Test name, synonyms, and codes, specimen collection, processing, and transport requirements, and reference ranges and interpretive information are adapted to Pathology & Laboratory Medicine Service’s local laboratory test configuration. The local display of test properties and results is integrated into context sensitive views provided by the VistA/CPRS medical record system.

A small number of reference lab tests are reported in a complex format that is best supported by scanning, in the VistA/CPRS (patient) record, a scanned image of the paper report. Access to these reports is available through the VistA Imaging layer of the CPRS graphical user interface.

* 1. Commercial Reference Laboratory – LabCorp of America

The majority of laboratory tests that are not performed on-site are referred to the LabCorp of America commercial reference laboratory. A courier from LabCorp picks-up and delivers specimens once daily or STAT (as requested).

* 1. University of Kentucky Medical Center (UKMC) Department of Pathology and Laboratory Medicine

Through a contract for services between the UK and VA Medical Centers, P&LMS directs specimens for selected analyses to the UKMC Department of Pathology and Laboratory Medicine. (Authorized VA laboratory personnel must coordinate specimen delivery.)

## TEST PROCEDURES

All laboratory procedures and instrumentation have been selected for high throughput, accuracy, and precision. Prior to use, assay accuracy, precision, and reportable range are verified. Reference ranges are validated for our patient population.

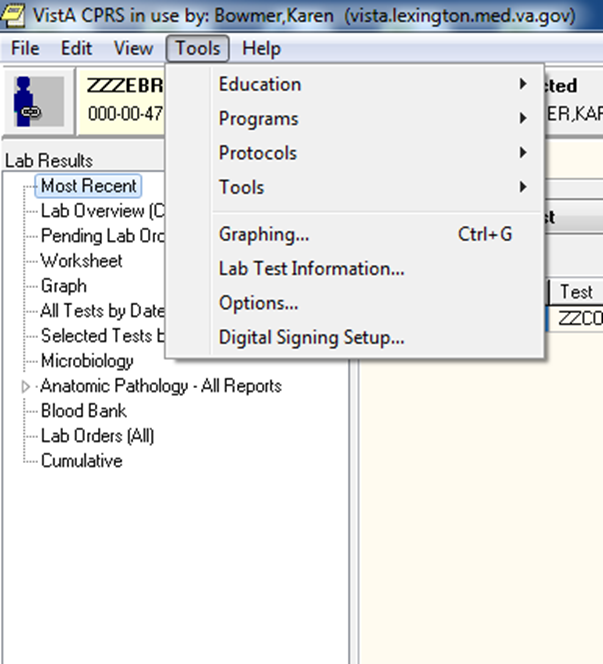
We strive for the highest standards to assure that the test results are an accurate laboratory index upon which treatment or diagnosis can be based. (Pathology & Laboratory Medicine Service can furnish a client with a written description of a specified test method’s performance specifications. To request additional lab test information or clarify results interpretation, please call a pathologist or section supervisor. Telephone extensions are listed near the front of this manual.)

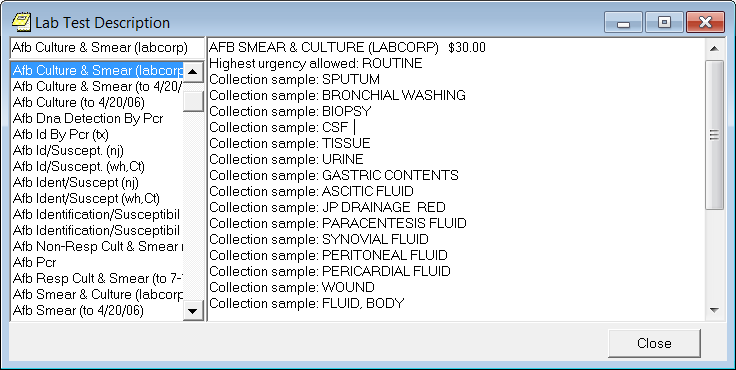
## TEST INFORMATION IN CPRS AND VISTA

1. CPRS

Pathology & Laboratory Medicine Service reports the results of several thousand different laboratory tests. While every effort is made to keep the lists, in this document, up-to-date they are still subject to revision delays.

Pathology & Laboratory Medicine Service recommends that providers use the VistA/CPRS ‘Lab Test Information’ Tool as the first choice for reference range and specimen requirement information. This online version of the laboratory’s test library is instantly updated with each test addition or revision. **The following screenshots demonstrate the lab test attributes that can be viewed using the CPRS tool.**





1. VistA’s text-based interface provides online documentation in the following manner:

(user inputs are in **bold** typeface)

Select SYSTEM COMMAND OPTIONS Option: **^Test description information**

Select LABORATORY TEST NAME: **CBC/PLT**

Lab test Highest allowed urgency Cost

CBC/PLT CODE 500 10.31

Synonym:

WBC

RBC

HEMOGRAM

Tests in panel:

WBC

RBC

HGB & HCT

MCV

MCH

MCHC

RDW

PLATELET COUNT

PLT (PHASE)

MPV

Collection Sample VA Lab Slip Container Vol Req(ml)

BLOOD LAVENDER 1

## BLOOD SPECIMEN COLLECTION TUBES

It is important that all specimens, received in the laboratory, be properly labeled with patient name, and full or last four digits of the social security number. In addition, certain specimens, such as therapeutic drug assays, 24 hr urines, and specimens for Blood Bank, require date and time of collection. The following table provides a general description of blood collection tubes:

|  |  |  |
| --- | --- | --- |
| **Tube Top Color** | **Additive** | **Collection Comments** |
| Dark Yellow  (Wampole Isolator 10 Tube) | LYSING AGENT | Wampole Isolator 10 microbial tube. Used for microbial studies - especially Mycology (blood) culture |
| Blue | SODIUM CITRATE anticoagulant | Used for coagulation assays especially PT/INR and PTT. |
| Royal Blue | K2 EDTA | Used for Heavy Metals: Lead, Arsenic, Mercury |
| Gray  (Plastic 6 ml) | POTASSIUM OXALATE (anticoagulant) and SODIUM FLUORIDE (preservative) | Used for lactic acid assays and other tests that require inhibition of carbohydrate metabolism in the collected specimen |
| Gray  (Glass 7ml) | SODIUM FLUORIDE | Used for Alcohol Profile: Ethanol, Methanol, Isopropanol, Acetone (Quant) |
| Green | SODIUM HEPARIN anticoagulant | Used for chromosome analysis and a variety of esoteric whole blood assays. |
| Green/Red | LITHIUM HEPARIN anticoagulant and SERUM SEPARATOR | Used for a variety of Chemistry assays (especially AMA compliant panels P1, P2, P4, P5, Lipid Profile CK MB, Troponin, Ammonia)) |
| Lavender/Purple | EDTA anticoagulant | Used for Hematology studies (especially CBC) and a variety of esoteric plasma and whole blood assays and Intact PTH |
| Red | NO Additive | Used for Blood Bank procedures, special drug and serologic assays |
| Red/Grey | CLOT ACTIVATOR and SERUM SEPARATOR | NO anticoagulant. Used for many send out tests as well as thyroid profile, Free T4, TSH, lithium, Vancomycin, FE/TIBC, Digoxin |
| Yellow  (BD Vacutainer ACD label on  tube | ACID CITRATE DEXTROSE anticoagulant | Used for tissue typing and flow cytometry procedures |
| Aerobic and anaerobic blood culture bottle | 40 ml of MEDIA | Used for collection of blood cultures |

## REQUESTING LABORATORY SERVICES

The following guidelines for requesting laboratory services are required by the hospital information system and/or College of American Pathologist’s Commission on Laboratory Accreditation. It is essential that the laboratory protect the integrity of the patient medical record and meet requirements for accreditation, therefore the following laboratory test ordering guidelines must be followed:

Laboratory orders (including Blood Bank requests) must be created and electronically signed, using the VistA Computerized Patient Record System (CPRS). VistA/CPRS requires the following information:

(Asserted using the ‘Select Patient’ and ‘Write Orders’ (Orders Tab) menus of CPRS)

### Patient name

### Encounter Provider

### Encounter Location (choose one)

* + - * 1. Clinic Appointment
        2. Hospital Admissions
        3. New Visit
      1. Collection Sample
      2. Urgency (choose one – listed by increasing urgency.)
         1. Routine
         2. Patient Waiting
         3. STAT
         4. Critical
         5. Code / RRT

Urgency choice is ‘lab test sensitive’. All tests can be ordered with a Routine Urgency, but only designated tests can be selected as Patient Waiting, STAT, Critical, or Code / RRT. To view a test’s allowable urgency status please refer to the CPRS ‘Tools’ menu option: ‘Lab Test Information’ field: ‘Highest Urgency Allowed’.

* + - 1. Collection Type (choose one)
         1. Lab Collect – collected in the early AM by Patient Care Service’s Ancillary Support staff. (This status does not include service to the 6-SOUTH intensive care unit.)
         2. Ward Collect – collected by staff members that support the hospital location including the Nursing Ancillary Service Support (NASA) personal and nursing services in the ICU and CCU units. Use for testing needed other than early morning routine lab testing.
         3. Send Patient – For ambulatory patients only. The specimen is collected when the patient reports to the laboratory’s outpatient phlebotomy area.
         4. Immediate Collect – No longer used. Please do not use this designation.
      2. Collection Date/Time
      3. Electronic Signature – applied using the ‘Signature On Chart’ option of the CPRS ‘Action’ menu.

## Oral Requests

Oral requests for additional tests, to be performed on specimens already received by the laboratory, must be ordered by the provider in CPRS. The order number is then given to the technologist who will accession the order and perform testing on specimens already received in the laboratory.

An oral test request may also be accepted under emergency conditions (such as CODE 500 urgency). Oral requests must be assigned to the appropriate provider and classified as Nature of Order/Change: VERBAL. (Verbal Nature of Order status compels the assigned provider to electronically sign the order.)

## VistA Computer System unavailable

If the VistA/CPRS hospital information system is unavailable, a VA (Laboratory) Miscellaneous Request Slip (SF-557), containing the following information, must accompany the specimen:

* Patient Name
* Social Security Number
* Specimen Type
* Time of Collection
* Test required
* Patient Location
* Provider
* Urgency of the request

## BLOOD BANK AND TISSUE BANK ORDERS

The physician must place the Blood Bank order in CPRS before the specimen can be drawn and properly accessioned into the Blood Bank. In case of emergency, the Blood Bank technologist will place the order in CPRS using the designation “Signature on Chart.” During a computer downtime, a paper “Blood Bank Sample Request Form” should be filled out and sent with the specimen to the lab. When the computers are available, the blood bank technologist will enter the request into the CPRS using the designation “Signature on Chart.”

Requests for Tissue Bank Services are entered as a (CPRS) consult named: “Bone & Tissue Request in Blood Bank”.

## Anatomic Pathology Requests

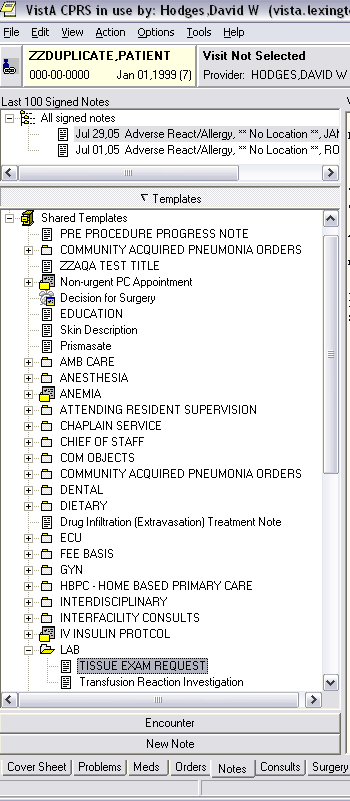
Requests for Anatomic Pathology procedures must be presented as a VistA or VistA/CPRS generated (paper-printed) form designated: ‘Tissue Examination Request’ (REPLACEMENT FORM 515). (The form is usually created using the VistA/CPRS Progress Note Template named TISSUE/CYTOLOGY EXAM REQUEST – see next page.) A user can manipulate the text-based VistA interface to generate a Tissue Examination Request using the following VistA option:

Select Laboratory Menu (Physicians) Option: ^**Tissue Examination Request**

Enter information for Tissue Examination Request (REPLACEMENT FORM 515)

Select PATIENT NAME:

The ‘Notes’ tab of the VistA/CPRS application offers the preferred method for creating a Tissue Examination Request. (The ‘TISSUE EXAM REQUEST’ aka TISSUE/CYTOLOGY EXAM REQUEST is available as a Shared Template.) The template presents essential patient specimen information fields that **must** completed by the CPRS user. After the information is entered, it’s finalized as a progress note. A copy of the TISSUE/CYTOLOGY EXAM REQUEST progress note must be printed and submitted with the properly labeled specimen.



An Anatomic Pathology Tissue Examination Request requires the following information: (entry is prompted by the VistA/CPRS dialog)

* The patient's name and social security number
* The type of specimen
* The patient location (ward or clinic)
* Date specimen obtained
* Brief clinical history
* Operative procedure
* Preoperative diagnosis
* Operative findings
* Postoperative diagnosis
* Person submitting specimen
* Attending provider

## DESIGNATION OF "URGENCY" STATUS OF LABORATORY REQUESTS

The authority to indicate an “urgency” status higher than routine, for a laboratory request, is given only to the individual responsible for the patient's care. However, the laboratory service reserves the authority to place a priority on completing "emergency" requests

"**Routine**" - A laboratory request without a special "urgency" status is considered routine and is generally completed within three hours. (The exceptions are test runs that are only completed once or less per day.)

For more information on test availability, see the test list section at the end of this manual.

"**Patient Waiting**" - A laboratory request so marked will indicate to the laboratory that a provider has asked the patient to wait for the results. The laboratory will make every effort to make these results available without delay; however, the more urgent needs of other patient testing will be taken into consideration. Expected turnaround time for Patient Waiting test results is within ninety minutes of receipt of specimen. An exception is for LD Patient Waiting requests which are generally completed within 2-3 hours due to additional transport time.

"**STAT**" - A laboratory request marked as STAT will signal that urgent test results are needed for management of the patient. These requests take precedence over the Patient Waiting urgency. Expected turnaround time for STAT testing is one hour from receipt of the specimen.

**“Critical**" - Indicates delay of the lab test results is life threatening. These requests take precedence over STAT urgency.

"**Code 500**" – This is the highest priority of all lab test requests. Immediate results are needed to protect the life of the patient. The tests take precedence over STAT or CRITICAL urgency.

## SUBMISSION OF LABORATORY SPECIMENS TO THE LABORATORY

Note: All specimens transported to the laboratory must be placed in a Ziploc **BIOHAZARD** bag.

Specimens received in the laboratory must be properly collected, preserved, and labeled. An appropriate container is required.

All specimens must be correctly identified with the patient’s name, social security number, test requested, laboratory order number, date/time of collection, and the initials of the collector. The patient specimen must be labeled immediately after collection. Labels can be printed with this information, including barcodes containing the laboratory order number, using VistA/CPRS.

Printing order labels from CPRS can be accomplished using the following steps:

* Open CPRS and select appropriate patient.
* Open orders tab
* Highlight appropriate order by clicking on it. More than one order may be chosen by holding down the “Ctrl” key and selecting all desired orders.
* Click on “File” in the top left corner which will open a drop down box.
* Click on “Labels” and then click on “print all checked items.”

Make sure to record initials, date and time of collection on tube before sending to the lab.

Example of CPRS order label:



If a label cannot be generated by an electronic device then the above information must be handwritten on the label. The order number must be specific to the patient identified on the label.

Urine specimens for Urinalysis and Urine Microbiology must have the following information written on the label: name and social security number of the patient, order number, date and time of collection, and type of specimen. Labels may also be printed from VistA/CPRS for microbiology and urinalysis specimens.

Following is a list of circumstances that prevent the laboratory from accepting a specimen for analysis:

* The omission of information required for proper analysis or results reporting
* Illegible or incomplete patient identification
* The specimen is inappropriate for the requested analysis.
* Evidence exists that the specimen’s patient identifier is incorrect
* The patient identifier associated with the laboratory order number, conflicts with the patient identifier on the specimen label.

## LABORATORY SPECIMEN COLLECTION

### **Outpatient Specimen Collection**

#### Outpatient Lab Specimen Collection is performed at CDD room C114, at LD Bldg. 1, room 16 and in Bldg. 16, room 9.

CDD Outpatient Phlebotomy hours of operation are 07:00 - 16:20 hours (7am-4:20pm), Mon.-Fri.  LDD Outpatient Phlebotomy hours of operation are 08:00 – 16:20 hours (8am-4:20pm) Mon.-Fri. Phlebotomy services are provided for extended hour and Saturday primary care clinics from 8am-4pm on Saturdays.  Additional weekend and holiday outpatient phlebotomy service is not provided by the laboratory.  Outpatient lab specimen collections, performed outside the Outpatient Phlebotomy Area’s normal operating hours, are completed by Primary or Ambulatory Care staff members.  (The collecting service must arrange transport of the lab specimen(s) to the CDD laboratory.)

1. Outpatient lab orders should be created as SEND PATIENT Specimen Collection Type.
2. Outpatient lab orders are screened using the locally created VistA Lab Package option named:

* PENDING LAB ORDERS (T-14 to T+3)  [AKX LAB PENDING ORDERS]

This VistA option searches for patient lab orders specified for collection 3 days in advance and 14 days in the past of the current date.  The laboratory will draw orders outside this window of time only if the patient or provider gives verbal or written instructions to act on “other-dated” lab test orders.

1. Prior to phlebotomy, patient identity is confirmed with two forms of identification –phlebotomist review of the patient’s ID card AND declaration of the patient social security number, to the phlebotomist, by the patient or family member. If the patient or family cannot declare the social security number, then alternate confirmation may be attained by asking the patient or family member to state the patient’s birth date.  The phlebotomist must confirm the patient name and social security number on all specimen labels.
2. If the patient does not have an ID card he or she must state their name and full social security number. If the patient is unable to state his or her name and social security number, then a relative, friend, or nurse must provide confirmation of the patient’s name and social security number.

### **Inpatient Specimen Collection (ext. 7509)**

Inpatients MUST wear an identification armband. The armband MUST display the patient’s name and social security number. The patient’s identity MUST be confirmed, by the phlebotomist, prior to lab specimen collection.

1. The verification of patient identity is accomplished by asking the patient to state his or her name and social security number and validating that the stated information matches the displayed name and social security number on the identification armband. (This standard method satisfies the hospital’s “two forms of identification” requirement.)
2. If the patient does not respond to a request for name and social security number then the phlebotomist may establish patient identity by verifying the name and social security number displayed on the identification armband. (It is emphasized that the absence of patient verbalization of his or her name and social security number is only permitted if the patient is unresponsive.)

**Laboratory specimens will NOT be collected from inpatients who are not wearing armbands or whose armbands are illegible.**

1. CDD and LD inpatient specimen collections are grouped by inpatient care units and organized by type:

* **LAB COLLECT** – Also known as the “AM Collection” or “FIRST MORNING AM LABS”. Specimens of Collection Type: LAB COLLECT specimens may only be given a ROUTINE urgency designation and are collected by Patient Care Service’s Ancillary Support team during the scheduled early morning phlebotomy rounds. Orders for inclusion in the NEXT scheduled LAB COLLECT phlebotomy round must be finalized during the 24 hour period prior to 3:29 AM. This list is built shortly after 3:30AM. Any orders placed after 3:30 AM will automatically default to the next morning. If an order is placed as Lab Collect after 3:30 AM the phlebotomists will not see the order until the next day. This is not for add-on testing to be collected throughout the day.
* **TIMED/TODAY LABS** (also known as WARD COLLECT) are for labs that need to be drawn at times other than the routine 5:00 AM collection list. The placing of WARD COLLECT orders between 5 AM and 9 AM should be avoided as this is when the phlebotomists are busy drawing the AM collection. Any routine “add-on” labs that are not time dependent should be ordered as LAB COLLECT to try to reduce the number of sticks for our patients.

**Preventing Unnecessary Sticks**

* If your patient requires timed testing, i.e. Troponin or PT/INR every four hours, check to see if he/she has other timed tests and coordinate your orders with those. This will prevent unnecessary sticks.
* Always order routine tests that can wait for morning collection, as “Lab Collect.” The results for these tests will usually be available the same day as collected.
* Send out tests are only picked up once a day by the reference lab courier in the afternoon, so ordering these tests to be collected in the afternoon/evening, instead of “Lab Collect” (am collection) will cause an unnecessary stick.
* **IMMEDIATE COLLECT:** This legacy collection method was used when the laboratory service drew all of the blood specimens and is no longer suitable with the implementation of the Patient Care Service’s Ancillary Support team. **This should no longer be used.**

The CPRS user must be mindful of the high demand for the hospital’s limited phlebotomy resources and allow for the fact that the specified CPRS “Collection Date/Time” is an approximation. Variance from the approximation is directly related to the phlebotomy team’s workload.

1. The SEND PATIENT Specimen Collection Type is not honored for inpatients.  **SEND PATIENT Specimen Collection Type is strictly limited to the outpatients.**

## POLICY CONCERNING UNCOOPERATIVE PATIENTS

The laboratory employee will refrain from performing specimen collection whenever a patient indicates, in any manner, that he or she does not wish to cooperate with the specimen collection process.

The patient’s provider will be notified of the patient’s refusal and collection of the specimen must then be coordinated by the provider team.

## POLICY CONCERNING SPECIMENS UNABLE TO BE COLLECTED (DELETION OF LAB ORDERS)

The provider will be notified of all lab orders that must be deleted.

The computerized record for all deleted lab orders/accessions must be supported by a comment that states a valid reason, the full name of the notified physician or nurse, and the date and time of notification.

Refer to Policy **“Deletion of Lab Orders/Accessions Pathology & Laboratory Medicine Service Policy”**

Follow the link below:

<https://vaww.v09.r03.portal.va.gov/sites/lexvamc/pathology/DocumentReferences/Deletion%20of%20Lab%20Orders%20-%20Accessions.docx>

## POLICY CONCERNING RE-COLLECTION OF LABORATORY SPECIMENS

If a specimen requires recollection, a laboratory staff member will contact the staff member responsible for obtaining the recollected specimen. A new order will be generated and accessioned to reflect the correct time of collection.

Refer to Policy **“Guidelines for Re-Collection of Laboratory Specimens – Pathology and Laboratory Medicine Service Policy”**

Follow the link below:

<https://vaww.v09.r03.portal.va.gov/sites/lexvamc/pathology/DocumentReferences/Re-collection%20of%20Specimens.doc>

## REPORTING OF LABORATORY RESULTS

### GENERAL REPORTING

Laboratory reports are viewable in the VistA/CPRS patient record system immediately upon verify/release.

The “verify/release” process is performed by a qualified member of Pathology & Laboratory Medicine Service (a laboratorian holding the LRVERIFY VistA/CPRS security key).

A Pathology & Laboratory Service representative will notify the Emergency Department and intensive care units whenever results for tests with a STAT urgency are delayed for a period exceeding 90 minutes. Any delay of test results with a CRITICAL or CODE 500 urgency will be communicated to the provider.

1. CRITICAL LABORATORY RESULTS

The reporting of critical laboratory results is managed in accordance with the service policy entitled: “Reporting of Critical Test Values - Pathology and Laboratory Medicine Service”

(filename: Critical Lab Test Values Reporting ver \*.doc) Follow the link below <https://vaww.v09.r03.portal.va.gov/sites/lexvamc/pathology/DocumentReferences/Critical%20Lab%20Test%20Values%20Reporting%20Policy.doc>

1. LICENSED RESPONSIBLE CAREGIVER INQUIRY

A verbal request for laboratory results, initiated by a VA staff member identified as a licensed responsible caregiver (MD, PharmD, NP, PA, RN, or LPN), may be honored if the requestor can offer a reasonable justification. The justification must be supported by an affirmation that the requestor is responsible for an aspect of the patient’s health care.

### OTHER INQUIRIES

All other requests for laboratory results must be coordinated by the Release of Information Section of Health Administration Service (phone ext. 5957, room C-225).

# ANCILLARY TESTING

LOCATION: B-116

TELEPHONE: 4520

HOURS OF OPERATION: 8:00 AM - 4:30 PM, Monday through Friday

SECTION DIRECTOR: David Hunt, MD, Ph.D., Ext. 4497

ANCILLARY TESTING COORDINATOR: Susan Thompson, B.S., M.T. (ASCP) Ext. 4520

Ancillary testing is defined as laboratory testing or services within a VA Medical Center or its outreach functions (clinic et. al.) that is performed outside the physical facilities of the main clinical laboratory. The Chief, Pathology and Laboratory Medicine Service is responsible for quality management oversight of this testing. The Ancillary Testing Coordinator (ATC), appointed by the service chief, acts as technical supervisor for all Ancillary Testing Sites and oversees:

a. Quality control

b. Records control

c. Proficiency testing

d. Inspection and accreditation

e. Training and yearly competency evaluation

Ancillary Testing Sites include Respiratory Therapy, in addition to all hospital wards, outpatient clinic, and long term care wards at the Leestown Division and Community Based Outpatient Clinics located at Somerset, Morehead, Berea and Hazard. These sites perform point-of-care chemistry, hematology, coagulation, and urinalysis testing. All Quality Control records and instrument documentation is stored in the laboratory as well as on-site at remote locations. Specific Procedure Manuals are available to operators in written form, at each instrument location, and on the P&LMS SharePoint site.

* 1. Respiratory Therapy Section of Medical Service operates the Blood Gas Laboratory located in room B-316. For more information about blood gas and oximetry assays, call Chastity Daukas, extension 4637.
  2. At the time of this printing, point-of-care tests performed by specified hospital wards and clinics include:

Whole Blood Glucose Whole Blood INR

Activated Clotting Time Dipstick Urinalysis POC Blood Gas and Electrolytes

Urine HCG

The list of trained staff performing testing is on file in the laboratory.

For more information about these tests contact Susan Thompson, Ancillary Testing Coordinator, room B-116, ext. 4520.

## Summary of Waived Testing - Definitive and Screening

Waived testing is present at locations approved by the Chief, Pathology and Laboratory Medicine Service. Each test is evaluated and delineated as definitive or screen. If a test is a screen, confirmation must be performed by further testing or in conjunction with standard diagnostic procedures. Definitive tests report a value that may be considered definitive for the purpose of care and diagnosis. Screening tests must be regarded as a screening tool, which require further testing or use in conjunction with other diagnostic procedures. The table below summarizes diagnostic testing methods in use at this hospital and clinics, classified as waived testing under federal law and regulation. These methods must comply with standards detailed in the Joint Commission Comprehensive Accreditation Manual for Hospitals (CAMH). (Re: Section Waived Testing WT 01.01.01). Procedure manuals are available for each test, listing specimen type and collection, limitations of test methodology, reagent use, and other pertinent information for testing personnel. Both hard copies at testing sites and electronic versions available on the P&LMS Sharepoint site exist for reference by testing personnel.

|  |  |  |  |
| --- | --- | --- | --- |
| **"Waived" Test Method** | **Performed by** | **Status** | **Purpose and Confirmation** |
| Glucose Monitoring (capillary, venous, & arterial whole blood) | 6S, 5M, 4S, Dialysis, 3N, 3S Preop, 2S, ED, Primary Care (LD) & 2W Specialty Clinics & surgery clinic (CDD), PACU, Dental clinics, 27-1, 27-2, Somerset CBOC, Morehead CBOC, Berea CBOC, Hazard CBOC, Sleep Lab, Chemo, Endo, Chemotherapy | Definitive | Provide rapid glucose test results for diabetes management and detection of hypo and hyperglycemia. |
| Fecal Occult Blood | Pathology | Screening | Screen for gastrointestinal bleeding. **Confirmation**: by physical examination or other provider performed assessment. Laboratory follow-up is recommended for all positive results and any negative results that are inconsistent with the clinical picture. |
| Gastric Occult Blood | Pathology | Screening | Screen for gastric bleeding. **Confirmation**: by physical examination or other provider performed assessment. |
| **"Waived" Test Method** | **Performed by** | **Status** | **Purpose and Confirmation** |
| Dipstick Urinalysis | Urology Section, Pathology | Screening | Patients with + urine glucose are screened for diabetes and referred to Medical Service. Patients with + nitrite or + leukocyte esterase are evaluated for urinary tract infection by examination and Microbiology Culture and Sensitivity. Provider need for urine microscopic examination is met by submitting a urine specimen to Urinalysis Section. |
| Urine Pregnancy (HCG) | Pathology, Women’s Health Clinic, CBOCs (Somerset, Morehead, Berea, Hazard) | Definitive | Detect HCG secreted in the urine of pregnant women. This is a qualitative test to rapidly confirm current or recent pregnant state. |
| Erythrocyte Sedimentation Rate | Pathology | Definitive | Reflect inflammatory process. This is a non-specific test which may be elevated during infections, auto-immune diseases, and other diseases where total protein is elevated (such as myeloma). |
| Ultra Strep A test | Pathology at CDD | Definitive | Positive results are definitive for Group A Strep. Negative results are followed with culture. |

# BLOOD BANK

LOCATION: Room B-102

TELEPHONE: VA Ext. 4517, 5937

HOURS OF OPERATION: 24 hours/day, 7 days/week.

SUPERVISOR: Angie McCowan-Bailey, B.S., M.T., (ASCP)

PATHOLOGIST: Duncan MacIvor, MD Director, Blood Bank

## PROCEDURES AND TESTS:

1. Technical Name: ABO & Rh typing

2. Technical Name: Direct Coombs

3. Technical Name: Type and Hold

ABO Grouping

Rh Typing

Antibody Screen

Transfusion Reaction

Comments and Special Instructions: No blood will be cross-matched unless an order is placed in CPRS.

4. Technical Name: Red Blood Cells

1. Leukocyte Reduced Packed Cells (LRPC): Order in CPRS and specimen submitted with a Blood Specimen Request Form.

Must be approved by Pathology Resident on call unless Hgb is less than or equal to 8.0 OR HCT is less than or equal to 24.0

1. Washed Red Cells, Frozen RBC’s, Deglycerolized RBC’s, Irradiated RBC’s Comment and Special Instructions: Special requirements must be approved by Blood Bank Director
2. Technical Name: Blood Components not requiring a cross match:
3. Fresh Frozen Plasma (FFP)

Comment and Special Instructions: Must be approved by the Pathology Resident on call unless the INR is ≤ 1.5. Allow one hour for thawing.

1. Platelet Concentrates

Comment and Special Instructions: Must be approved by the Pathology Resident on call unless platelet count ≤20,000/mm (or ≤50,000/mm if patient is actively bleeding).

1. Cryoprecipitate

Comment and Special Instructions: Must be approved by Pathology Resident on call unless fibrinogen ≤100mg/dl

1. Technical Name: Tissue Typing (HLA)
2. HLA A & B typing for platelets

Comment and Special Instructions: Sent to U.K.

1. HLA Platelet Antibody Screen

Comment and Special Instructions: Sent to U.K.

1. Technical Name: Transfusion Reaction
2. Place an order in CPRS.
3. Submit a Transfusion Reaction Form VAF 10-9034
4. Comment and Special Instructions: Submit a Blood Specimen Request Form (VAF# OP113-06(596) and specimen. Follow instructions on the Transfusion Reaction Form (VAF 10-9034) and complete part A. Return any empty blood bags along with attached infusion set and IV saline bag to the blood bank. Send a post transfusion clot, EDTA tube and a first voided urine specimen to the blood bank.
5. Technical Name: Emergency Request and Release of Blood

Emergency Request and Release of Blood form (VAF 10-0114j) submitted with a specimen and Blood Bank Specimen Request form (VAF# OP113-06(596).

Comments and Special Instructions: Emergency release form must be signed by the requesting physician and the reason for emergency release must be stated on the form.

1. OTHER TESTS ARE AVAILABLE IN THE BLOOD BANK UPON SPECIAL REQUEST AND AFTER CONSULTATION WITH THE BLOOD BANK SUPERVISOR AND/OR DIRECTOR, OR AT THE DISCRETION OF THE BLOOD BANK TECHNOLOGISTS.

## SPECIMENS FOR BLOOD BANK

1. What and How Much to Draw:

Blood Bank tests require a full 10 ml. plain red-topped tube. If more than 6 units of blood are cross-matched or if antibody or cross matching difficulties arise, more blood may be required. When a Direct Coombs is ordered, an EDTA tube should also be obtained. If for any reason Blood Bank personnel need additional blood specimens, the nurse or Ancillary Support Personnel will be notified by the technologist. When additional Blood Bank specimens are drawn they will be accompanied by a Blood Bank Specimen Request Form VAF #OP113-06(596). Blood will not be available for a patient until a CPRS order is received in the Blood Bank. Uncrossed blood will be available on an emergency basis.

1. How to Label the Specimen:

All Blood Bank specimens must be identified by an adhesive label generated from the computer bearing recipient’s full name and full social security number. The specimen must be signed, dated, and timed by the person drawing the specimen and accompanied by a Blood Bank Sample Request Form with the same information. All specimens must be free of hemolysis. The Transfusion Service will only accept specimens that are complete, accurate and legibly labeled. Specimens that arrive in the Blood Bank incorrectly labeled will be discarded, the service will be notified and a new specimen will need to be submitted. In cases of medical emergencies if the submitted blood specimen is unacceptable because of mislabeling, uncrossmatched Group O, Rh-negative packed cells will be issued. A properly labeled specimen must then be submitted for crossmatch.

1. Drawing Specimens for Blood Bank:

Physicians, residents, acting interns, third and fourth year medical students, professional nurses, laboratory personnel and Ancillary Support Assistants are the only personnel authorized to draw a patient's blood specimen to be used for type and crossmatch. Specimens collected by third and fourth year medical students are done so under the supervision of the responsible house staff.

1. Obtaining Blood Specimen:

Positive identification of the prospective recipient must be made prior to obtaining the blood specimen. Proper identification is performed by checking the hospital wristband for full name and full social security number and by verbally asking the patient to state his/her full name and full social security number. A second person, referred to as the Verifier, is required to identify the patient immediately prior to collection and sign the Blood Specimen Request Form. If the patient cannot verbally state name and social security number, a person with knowledge of the patient such as a family member or nurse should be asked to state the full name and full social security number. The patient information on the Blood Bank specimen label and Blood Bank Specimen Request Form should be checked against the patient’s wristband. The sample should be labeled at the bedside immediately after collection. Blood will not be drawn by any personnel unless the patient is wearing a properly affixed hospital identification band and all identification criteria have been met.

1. Age of Blood Specimen:

A specimen of blood to be used for crossmatch must be less than 72 hours old. The Blood Bank cannot accept a specimen that has been used by any other section of the laboratory.

## ORDERING OF BLOOD

1. How to Order:

The physician must place the Blood Bank order in CPRS before the specimen can be drawn and properly accessioned into the Blood Bank. In case of emergency, the Blood Bank technologist will place the order in CPRS.

1. Deadline for Ordering Blood for Surgeries:

Request for blood for elective surgery must be received in the Blood Bank no later than 2:00 PM on the day before the scheduled procedure, Monday through Friday, including holidays and no later than 2:00 PM Friday before a procedure scheduled on Monday. Late surgeries must be approved by the Blood Bank Director or Pathology Resident on call. It is the requesting physician's responsibility to call and obtain approval from the pathologist. The pathologist will in turn notify the Blood Bank of his/her decision.

1. How Long Crossmatched Blood is Held on Surgical and Medical Patients:
2. Medical patients - no blood transfused:

The blood will be released at 7:30 AM the third day after the crossmatch was performed. This period may be extended an additional 24 hours if the physician calls the Blood Bank and the patient has not been transfused within the last three months. Ex. Blood set up on 1/1, blood released on 1/4 at 7:30 AM.

1. Medical patients - some blood transfused.

The unused blood will be released 48-72 hours after transfusion, depending on when the patient received the first unit of blood. Any unused blood cannot remain crossmatched any longer than 72 hours on a patient who has received blood. If additional blood is needed, it must be reordered in CPRS and a new sample submitted.

Examples:

Patient received blood at 3 PM 1/1 blood released 7:30 AM 1/4.

Patient received blood at 3 AM 1/1, blood released 7:30 AM 1/3.

Patient received blood at 11 AM 1/1, blood released 7:30 AM 1/4.

1. Surgery patients- none transfused:

If no blood is used during the surgical procedure, all crossmatched blood will be released at 7:30 AM the day following surgery. This blood may be held an additional 24-48 hours if the Blood Bank is notified by the physician.

1. Surgery patients- some transfused:

If three or more units are used, the remaining blood will be held 48-72 hours, depending on when the patient received the first unit of blood.

Examples:

Patient received three units at 9 AM in OR 1/1, blood released 7:30 AM 1/4.

Patient received three units at 3 AM in OR 1/1, blood released 7:30 AM 1/3.

Patient received three units at 9 PM in OR 1/1, blood released 7:30 AM 1/4.

If less than three units were used, the remaining blood will be released at 7:30 AM the day after surgery.

1. Elective surgery that is canceled.

The Blood Bank should be notified by the physician and/or the OR personnel when a surgical procedure is canceled. Blood for such patients will be released automatically. If the physician wishes to have the blood remain crossmatched for subsequent surgery, the Blood Bank will do so if possible. If it is not possible, the Blood Bank will notify nursing personnel.

1. Mandatory release of elective surgery blood for use in an emergency.

The Blood Bank will crossmatch additional blood if, and when, it becomes available. If blood is not available, the responsible physician will be notified.

1. STAT blood:

Blood crossmatched STAT and not transfused within 48 hours will be released. This period may be extended an additional 24 hours if the physician notifies the Blood Bank.

## ORDERING BLOOD COMPONENTS:

1. Packed Red Cells

Red blood cells are the product of choice for any patient with severe anemia who does not require restoration of blood volume. Thus, red blood cells are the product of choice for most patients with acute blood loss (i.e. trauma, surgery), chronic anemia, congestive heart failure, and elderly or debilitated patients in whom rapid shifts of blood volume are not well tolerated. All packed red blood cells are issued from the Blood Bank with a PALL leukocyte reduction filter. The unit will be filters at bedside by the nurse administering the blood. An order must be entered in CPRS by the physician. Hgb must be ≤8.0 or Hct must be ≤24% or be approved by pathologist on call.

1. Leukocyte-Reduced Packed Cells

Most of our inventory is supplied as leukocyte pre-reduced packed cells. This component is used for potential transplant recipients and for patients with documented recurrent non-hemolytic febrile transfusion reactions. An order must be entered in CPRS by the physician. Hgb must be ≤8.0 or Hct must be ≤24% or be approved by pathologist on call.

1. Fresh Frozen Plasma

FFP should be used for patients who are actively bleeding, patients in D. I. C., patients who have been massively transfused with stored blood causing dilution of endogenous clotting factors, and for patients with abnormal coagulation studies. An order must be entered in CPRS by the physician prior to thawing. INR must be ≥1.5 or be approved by the pathologist on call.

1. Platelet Concentrates

The decision to transfuse platelets depends upon the clinical condition of the patient, the causes of the thrombocytopenia, the platelet count, and the functional ability of the patient's own platelets. Most physicians advise platelet transfusion to prevent serious bleeding in patients with a platelet count of less than 20,000/mm3. An order must be entered in CPRS. Platelet count must be ≤20,000 (or ≤50,000 if actively bleeding) or be approved by pathologist on call.

1. Cryoprecipitate

Cryoprecipitate is now used primarily as a source of fibrinogen as it contains primarily Factor VIII, fibrinogen, and Factor XIII. The use of this product for the treatment of patients with Hemophilia A has generally been replaced by the use of the lyophilized Factor VIII concentrate. Occasionally, cryoprecipitate is used for the treatment of patients with Von Willebrand's disease, as well as for the rare patient with low levels of Factor VIII and with little or prior exposure to blood products, requiring an operative procedure. An order must be placed in CPRS. Fibrinogen must be ≤100 mg/dl or be approved by pathologist on call.

1. Frozen or Washed Red Blood Cells

All requests for frozen and washed red blood cells must be approved by the Blood Bank Director.

1. Emergency Blood (Uncrossmatched) (VAF 10-0114j)

It takes approximately forty-five minutes for the completion of a crossmatch if the appropriate type of blood is available. If the physician cannot wait for the completion of the crossmatch due to the critical condition of the patient, he/she may request type specific uncrossmatched blood. The Emergency Request and Release form is available at each nurse's station and in the Blood Bank. The physician is required to sign the form and state the reason for emergency release. A labeled recipient's blood specimen, Blood Specimen Request Form and the Emergency Request form should be submitted to the Blood Bank. The patient will be typed and appropriate type-specific uncrossmatched blood will be released. If there is not enough time to obtain an ABO on the specimen, O negative packed cells will be issued.

The technologist will proceed with the crossmatches. In the event there is any "incompatibility" the doctor will be notified immediately to stop the transfusion. Upon completion of the crossmatches if units are found to be compatible, the technologist will notify the floor and complete the Blood Transfusion Record Forms and send them to the floor to be completed by the nursing personnel.

1. Massive Transfusion Protocol

The Massive Transfusion Protocol is available for all patients undergoing massive hemorrhage. A typical definition of massive transfusion is 10 units of RBC in 24 hours. The purpose of enacting the protocol is to ensure the prompt availability of RBC, plasma, cryoprecipitate and platelets required to replace massive blood loss. The protocol may be activated by verbal order to the Blood Bank and will remain active until the situation is stabilized and the Blood Bank has been notified.

## ACQUISITION OF BLOOD

1. Surgery Blood
2. Blood for patients scheduled for elective surgery will be delivered once a day to the OR at 8:30 AM Monday through Friday, excluding holidays. OR personnel will be responsible for transporting any additional blood that may be needed for procedures.
3. The blood delivered to the operating room must be kept in the OR refrigerator until it is to be transfused –blood must not be kept in the operating room in anticipation of being transfused.
4. The units for each patient are numbered in sequence on the "Caution Tag”, indicating the order for transfusion. It is mandatory that blood be transfused in this order. If a unit is to be transfused, enter the “time-out” on the OR sheet when the blood is removed from the refrigerator. If the transfusion will be delayed or cancelled, the unit is to be returned immediately to the OR refrigerator and the “time in” recorded on the OR sheet.
5. Blood for Nursing Units:

Products may be signed out of the Blood Bank by any hospital personnel with the patient’s full name and social security number. Blood is never to be stored on the nursing unit. Blood should be transported only when the physician or RN is ready to start the transfusion, an order is entered in CPRS and consent has been obtained prior to the blood being transported out of the laboratory.

## RETURN OF UNUSED BLOOD TO THE BLOOD BANK

1. Surgery Blood:

Blood not used during surgery must be returned to the Blood Bank by 4 PM daily. Unused blood for scheduled cases not completed by 4:00pm and emergency cases should be returned as soon as the cases(s) is/are completed.

1. Nursing Units:

If there is a delay in starting the transfusion after sign out, the product should be returned to the Blood Bank as soon as possible. Blood Units with a temperature >10.0 degree Celsius will be discarded.

## ADMINISTRATION OF BLOOD AND BLOOD PRODUCTS

1. Pre-Transfusion Documentation
2. Orders – Requests for blood and blood components must have an order entered in CPRS by a physician or nurse practitioner. On occasion, a nurse or the Blood Bank tech may place an order in CPRS for the physician to sign. It is the nurse’s responsibility to ensure that consent has been obtained prior to transfusion.
3. Transfusion justification - It is recommended that the indications for administration of blood products be clearly documented in the CPRS order. Justification should include anticipated usage based on clinical presentation, estimated surgical blood loss, pertinent laboratory values and/or patient signs and symptoms suggesting transfusion need. If administration of the product will not meet the criteria for appropriate use of blood products at the VAMC, the justification should address the patient’s issues requiring this extraordinary usage (e.g. If the transfusion is to maintain a patient’s hemoglobin above 8 or hematocrit above 24%, indications for this request should be specifically stated).
4. Patient Instructions - The requesting physician must discuss the the alternatives, risks, and potential benefits of blood transfusions and obtain the patient’s consent prior to the administration of blood products.
5. Starting the Transfusion:

Physicians and registered nurses may start transfusion of blood and Components.

1. Verification Before Transfusion is Started:

Before the transfusion is started, two individuals (the nurse(s) and/or Physicians must verify the following:

1. The recipient's name and social security number on the patient's identification wristband, which must be attached to his arm or leg, must match the name and social security number on the Blood Transfusion Report Form and the “Caution Tag”. The patient should verbally state his full name and social security number if possible.
2. The unit number, ABO and Rh type on the blood bag must match the information on the Blood Transfusion Report Form.
3. The crossmatch record on the BTRF has been completed, and the BTRF contains two verifying signatures.
4. Administration:

Transfusion Practices

1. Patient's pre-transfusion vital signs must be recorded on the BTRF.
2. The date and time the transfusion is started must be recorded on the BTRF.
3. 15 minute vital signs should be recorded when applicable.
4. The transfusion must be completed within 4 hours of the sign out time.
5. Isotonic saline is the only solution suitable for transfusion.
6. RBCs, granulocytes and FFP should be transfused with a standard 170 filter. Platelets and Cryo can be transfused with a special filter obtained from the Blood Bank.
7. Completion of Transfusion:
8. Upon completion of the transfusion, the physician or registered nurse should sign the BTRF and indicate the time completed, amount of blood given, and the presence or absence of indications of transfusion reaction. The completed BTRF should be returned to the Blood Bank.
9. The empty blood or component bag and attached tubing will not be returned to the Blood Bank except in case of a suspected transfusion reaction. Bags will be discarded on the floors and treated as infectious waste.

## TRANSFUSION REACTIONS (VAF 10-9034)

1. Suspected Reaction:
2. If the patient develops urticaria or fever not exceeding 1.5C (or 2.7F), the physician should be notified before stopping the transfusion. If patient develops chills, fever exceeding 1.5C, dyspnea, nausea, chest pain, back pain, hypotension, or flushing, the transfusion should be stopped and the physician notified. The I.V. needle should be kept open with saline infusion.
3. If the physician decides to discontinue the transfusion, he/she should initiate a laboratory investigation by completing a Transfusion Reaction Form (VAF 10-9034) and placing an order in CPRS for a transfusion reaction workup.
4. The Blood Bank should be notified by the physician or nursing personnel. Post transfusion blood specimens (10 ml clotted blood and 7 ml EDTA blood), post transfusion urine, product bag with the recipient set attached, the BTRF and the transfusion reaction form should be submitted to the Blood Bank.
5. Laboratory Work-up of Transfusion Reaction:
6. Samples, requisitions, records and units are checked for clerical errors.
7. If hemoglobinemia or hemoglobinuria is detected or if the recipient's red cells from the post transfusion specimen give a positive Direct Coombs test, the physician and the Bood Bank Medical Director will be notified immediately.
8. Pre and Post specimens are ABO and Rh tested. Antibody screens are performed and units are recrossmatched. A urinalysis is performed.
9. The pathologist and/or pathology resident will review the investigation before additional blood will be released.
10. If the patient is so critical that the doctor insists on transfusing additional units before the work up is completed, then he/she must accept the blood as uncrossmatched or call the Blood Bank Medical Director for approval.
11. Serum Hepatitis or Other Transfusion-Related Disease in Post-Transfused Patients:
12. It is the responsibility of all physicians to be aware of the hazard of patients developing hepatitis, or other transfusion-related disease after the administration of blood or components. Testing of all blood donors for infectious disease markers have drastically reduced the incidence of transfusion transmitted infection. Currently, our supplier tests for Hepatitis B, Hepatitis C, HIV, Syphilis, HTLV I/II and West Nile Virus.
13. It shall be the responsibility of the physician to notify the Blood Bank of cases of suspected serum hepatitis or any other transfusion related disease possibly due to transfusion.
14. All hepatitis positive or HIV positive patients that have been transfused will be reviewed by the Blood Bank Medical Director and the Transfusion and Tissue Review Committee.
15. A written report will be sent to the Kentucky Blood Center Medical Director by the VA Blood Bank Medical Director indicating whether the donor investigation should be initiated.

# TISSUE BANK

LOCATION: Room B-102 (Blood Bank)

TELEPHONE: VA Ext. 4517, 5937

HOURS OF OPERATION: 24 hours/day, 7 days/week.

SUPERVISOR: Angie McCowan-Bailey, B.S., M.T., (ASCP)

TISSUE COORDINATOR: Catherine Stafford, B.S., M.T., (ASCP)

PATHOLOGIST: Duncan MacIvor, MD Director, Blood Bank

## Types of Tissue Stored in Blood/Tissue Bank

|  |  |
| --- | --- |
| Alloderm | Fibular/Radius/Ulna Shaft |
| Apligraf | Fibular Segment |
| Allomax | Graft Jacket |
| Bone Chips | Peri-Guard |
| Cervical (Vg2) Allograft Bone | Puros Allograft |
| Cornea | Rex Dowel |
| Crest Wedge Iliac | Tutoplast |
| Dermagraft | Vascu-Guard |
| Dura-Guard | Durepairs |
| Skin Allograft | Femoral Head |

Form: **518T – Blood Bank Tissue Implantation Record**

## How to Order Tissue

1. Determine patient’s diagnosis, type of bone and/or tissue needed and date of procedure.
2. Obtain provider’s name and service.
3. In CPRS, choose the “Consult” tab
4. Enter primary surgeon’s name in the “Encounter Provider” Box.
5. Click on the correct procedure date in the “clinic Appointments/Visits” box or select surgical service and date of procedure.
6. Dialogue box will appear stating “You have selected a visit with a date in the future. Are you sure? Click yes
7. Click Okay
8. Click on “Surgery Consults”
9. Click on “Operation Request”
10. Click on “Bone and Tissue Requests”
11. Complete requested information in “Reason for request: Bone and Tissue Request for the Blood Bank” text box.
12. Click Okay.
13. The consult will print in the Blood Bank
14. The technologist prepares the bone or tissue, requested by the consult, and completes a form 518T form.

## Emergency Bone/Tissue Request

The physician will complete the “Release of Tissue/Bone Outside Normal Hours (intervals: 00:00 to 08:00 and16:00-24:00 hours). The form is available in the Blood/Tissue Bank Section of the Laboratory (room B102).

## Return of Bone/Tissue from Surgery

Any unused Bone/Tissue will be returned to the Blood/Tissue Bank (Laboratory room B102) in a validated cooler (if sent in a cooler) with the Tissue Certificate signed, dated, and timed by the nurse stating that the Bone/Tissue was not removed from the cooler.

## Tissue Reaction

All Tissue Reactions will be reported to the Tissue Bank. The Tissue Coordinator will notify the Blood Bank Supervisor, Infectious Disease Team, and the Blood Bank Medical Director and Transfusion and Tissue Review Committee.

The Blood Bank Medical Director will review the patient medical record and notify the primary physician.

## Tissue Recalls

The vendor will notify the Tissue Bank and the Tissue Coordinator will follow up to see if the tissue has been implanted. If the tissue has been implanted, the Tissue Coordinator will notify the Blood Bank Supervisor and Medical Director for more follow up.

If the tissue has not been implanted the Tissue Coordinator will remove all tissue from the lot that is recalled and quarantine it.

## Transmitted Disease

The Infectious Disease Team will notify the Tissue Bank if a patient has tested positive for an infectious disease that may be related to the implant. The Blood Bank Medical Director will let the Tissue Coordinator know if the tissue vendor needs to be notified. Information will be taken to the Transfusion and Tissue Review Committee Meeting.

# CLINICAL CHEMISTRY

LOCATION: B-102

TELEPHONE: 4529

HOURS OF OPERATION: 24 Hours/Day, 7 Days/Week

SECTION DIRECTOR: David Hunt, MD, Ph.D. Ext. 4497

SUPERVISOR: Lee Ann Speaks, MT., (ASCP), Ext. 4968

## AVAILABILITY OF CHEMISTRY TESTS

1. Tests, which are available 24 hours/day, 7 days/week are:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Reporting Units | Serum Normal Range | Plasma Normal Range |
| ALB | g/dL | 3.1 - 5.5 | 3.5 - 5.0 |
| ALKP | U/L | 38 - 126 | 38 - 126 |
| ALT | U/L | 21 - 72 | 21 - 72 |
| AMON | umol/L | Plasma only | 9-30 |
| AMYL | U/L | 30 - 110 | 30 - 110 |
| AST | U/L | 17 - 59 | 17 - 59 |
| BUBC | mg/dL | BU 0.1 -1.1  BC 0.0 - 0.4 | BU 0.0 -1.1  BC 0.0 - 0.3 |
| BUN | mg/dL | 7 - 21 | 9-20 |
| CA | mg/dL | 8.6 - 10.6 | 8.4 - 10.2 |
| CHOL | mg/dL | < 200 | < 200 |
| CK | U/L | Plasma Only | 55 - 170 |
| CL | mmol/L | 95 - 111 | 98 - 107 |
| CREA | mg/dL | 0.66 - 1.25 m  0.52 - 1.04 f | 0.66 - 1.25 m  0.52 - 1.04 f |
| ECO2 | mmol/L | 22 - 31 | 22 - 30 |
| FE | ug/dL | 49 - 181 | Serum Only |
| GGT | U/L | 15 - 73 | 15 - 73 |
| GLU | mg/dL | 65 - 110 | 74 - 106 |
| dHDL | mg/dL | ≥ 40 | < 40.0 low ≥ 60 high |
| K | mmol/L | 3.5 - 5.0 | 3.5 - 5.0 |
| LAC | mmol/L | 0.7 - 2.1 | 0.7 - 2.1 |
| LDH | U/L | 313 - 618 | 313 - 618 |
| LIPA | U/L | 23 - 300 | 23 - 300 |
| MG | mg/dL | 1.7 - 2.2 | 1.6 - 2.3 |
| NA | mmol/L | 135 - 145 | 137 - 145 |
| PHOS | mg/dL | 2.4 - 4.4 | 2.5 -4.5 |
|  | Reporting Units | Serum Normal Range | Plasma Normal Range |
| TBIL | mg/dL | 0.0 - 1.5 | 0.2 - 1.3 |
| TP | g/dL | 6.0 - 8.3 | 6.3 - 8.2 |
| TRIG | mg/dL | < 150 | <150 |
| URIC | mg/dL | 3.5 - 8.5 | 3.5 - 8.5 |
| CRP | mg/L | < 10 | < 10 |
| CSF-PROT | mg/dL | 12 - 60 | 12 - 60 |
| U-PROT | mg/dL | < 12 | < 12 |
| ACET | ug/mL | 10 -30 | 10 -30 |
| ALC | mg/dL | < 10 | < 10 |
| CRBM | ug/mL | 4.0 - 12.0 | 4.0 - 12.0 |
| DGXN | ng/mL | .8 - 2.0 | Serum Only |
| LI | mEq/L | 0.6 - 1.4  (toxic >1.6) | Serum Only |
| PHYT | ug/mL | 10.0 - 20.0 | 10.0 - 20.0 |
| SALI | mg/dL | <20 | <20 |
| THEO | ug/mL | 10.0 - 20.0 | 10.0 - 20.0 |
| CK-MB | ng/mL | Lithium Hep Plasma Only | <5.0 |
| NTproBNP | pg/mL | Lithium Hep Plasma Only | <300 negative |
| TROP I | ng/mL | Lithium Hep Plasma Only | <0.034 |
| d-LDL | mg/dL | <100 | <100 |
| d-TIBC | ug/dL | 261-462 | Serum Only |
| GENT | ug/mL | tr <2.0  pk 8.0 - 12.0 | tr <2.0  pk 8.0-12.0 |
| mALB | mg/L | Urine only   0.0 -16.6 | |
| PALB | mg/dL | 19 - 37 | 17.6 - 36.0 |
| TOBRA | ug/mL | tr <2.0  pk 8.0 - 12.0 | tr <2.0  pk 8.0-12.0 |
| VALP | ug/mL | 50.0 - 120.0 | 50.0 - 120.0 |
| VANC | ug/mL | tr 10.0 – 20  pk 30.0 - 40 | Serum Only |

|  |  |  |
| --- | --- | --- |
| URINE DRUG SCREENS | | |
|  | Reporting Units | Cut-off |
| AMPH | ng/mL | 1000 |
| BARB | ng/mL | 200 |
| BENZ | ng/mL | 200 |
| COCM | ng/mL | 300 |
| METD | ng/mL | 300 |
| OP | ng/mL | 300 |
| OXY | ng/mL | 100 |
| THC | ng/mL | 50 |

Urine Tests available in lab include: mALB, Total Protein, Sodium, Potassium, Chloride, Creatinine, BUN, Glucose, Amylase, Phosphorus, Uric Acid, Magnesium, and Calcium. See Urine Specimen Collection for details and normal ranges.

Only those requests, which are required with minimum time delay for patient care should be designated as "STAT".

The physician should NOT rely on the early morning phlebotomy team to collect any "STAT" specimens, as this will result in undue delay in receipt of the specimen by the laboratory.

For approval of any procedures not orderable “STAT” but urgently needed by a physician, contact Dr. Hunt, the Head of the Chemistry Section, at Ext. 4497.

### Tests available Monday – Friday are:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Reporting Units | Serum Normal Range | Plasma Normal Range |
| B12 | pg/mL | 239 - 931 | 239 - 931 |
| Cort | ug/dL | 4.46 - 22.7 (before 10am) | 4.46 - 22.7  (before10am) |
| 1.7 - 14.1 (after 5pm) | 1.7 - 14.1 (after 5pm) |
| Ferr | ng/mL | 17.9 - 464 | 17.9 - 464 |
| Fol | ng/mL | 2.76 - >20 | 2.76 - >20 |
| FT4 | ng/dL | 0.78 - 2.19 | Serum only |
| iPTH | pg/mL | EDTA Only | 7.5 - 53.5 |
| PSA | ng/mL | 0 -4 | 0 - 4 |
| Testost | ng/dL | 132 - 813 males (20-49yrs) | 132 - 813 males (20-49yrs) |
| 71.8 - 623 males(>50yrs) | 71.8 – 623 males(>50yrs) |
| 5.71 - 77.0 females w/menses | 5.71 - 77.0 females w/menses |
| TSH | uIU/mL | 0.465 - 4.68 | 0.465 - 4.68 |
| TT3 | ng/mL | 0.97 - 1.69 | * 1. - 1.69 |

### AVAILABLE PANELS

1. Organ Specific Paneling

PANEL #1 BASIC METABOLIC

Sodium, potassium, chloride, carbon dioxide, glucose, BUN, creatinine, anion gap, calcium

PANEL #2 LIVER

AST, ALT, alkaline phosphatase, total protein, albumin, total bilirubin, direct bilirubin (direct bilirubin = total bilirubin – unconjugated bilirubin)

PANEL #4 RENAL

Sodium, potassium, chloride, carbon dioxide, BUN, creatinine, glucose, calcium, phosphorous, anion gap, albumin

PANEL #5 COMPREHENSIVE METABOLIC

Sodium, potassium, chloride, carbon dioxide, glucose, BUN, creatinine, calcium, AST, ALT, alkaline phosphatase, total bilirubin, total protein, albumin, anion gap

LIPID PROFILE

Cholesterol, Triglyceride, dHDL, LDL (reflexing to Direct LDL when the Trig >400)

THYROID PROFILE

TSH, Free T4 (Free Thyroxine)

1. Ionized Calcium

The level of ionized calcium is particularly sensitive to specific pathological conditions and the physiological pH. Thus, samples which are not handled anaerobically acquire an elevated pH due to loss of CO2 upon exposure to the atmosphere. An increase of 0.1 pH unit causes a 4-5% decrease in the serum ionized calcium.

Ionized calcium is to be collected anaerobically, with a vacutainer (Green top tube-lithium heparin), iced, and delivered to the lab immediately. Collect with minimal stasis and in absence of muscular exercise. A fasting specimen is preferred. This test will be performed as received with results available within an hour.

1. Referred Test Schedule:

Several tests are sent to reference laboratories, which require about one week for test completion (see table at end for specific tests).

## COLLECTION AND PRESERVATION OF SPECIMENS

* 1. General Rules for Biological Specimens

Except for metabolic studies, blood specimens should be obtained after an overnight fast, or at least 4 hours after a solid meal.

When the substance analyzed is in blood, plasma is the preferred sample. Serum or whole blood must be used only when specified. Tests requiring serum are: Lithium, Vancomycin, Fe/TIBC, FT4 and Digoxin.

Plasma/serum samples should be free of hemolysis.

Cerebrospinal fluid and other body fluids should be analyzed promptly or refrigerated at 4 ͦ C.

1. Special Instructions for Blood Chemistry
2. Fasting Specimens

A patient who has not eaten for 10-12 hours is considered fasting. The patient may have had water. A 14 hour fast is recommended prior to the determination of triglyceride, cholesterol, and HDL-cholesterol determinations. Of the routine procedures, only glucose and phosphorus levels are significantly altered between fasting and non-fasting states.

1. Therapeutic Drugs

Extensive studies have shown that the therapeutic and toxic effects of therapeutic drugs are closely related to the plasma/serum concentration. These drugs should be closely monitored to assure that therapeutic levels are achieved.

ANTICONVULSANT DRUGS

Phenytoin (Dilantin)

Carbamazepine (Tegretol)

Valproic Acid

ANTIASTHMATIC DRUGS

Theophylline

ANTIBIOTIC, AMINOGLYCOSIDES

Gentamicin

Tobramycin

Vancomycin

Procedure/Guidelines for Optimal Specimen Collection Time in Relation to Drug Dosing:

* Dosage must be stable three doses prior to sampling. Doses cannot be changed or missed. A peak and trough must be collected.
* Elevated peak and trough values for the aminoglycoside antibiotics have been associated with irreversible ototoxicity and/or nephrotoxicity. Because the time interval required to achieve a peak aminoglycoside level is short (30-45 min.) after I.V. infusion, it is not possible to collect accurately timed blood samples by laboratory personnel. Therefore, these accurately timed blood samples must be collected on the floor by the physician.

IF ADMINISTERED IV:

* Trough: Collect not more than 30 min. before next dose.

Peak: Collect 30-45 min. following completion of infusion.

Patient samples, which contain penicillins or cephalosporins, have been shown to inactivate aminoglycosides in vitro.

These specimens should be delivered to the Lab immediately after collection.

IF ADMINISTERED EXTENDED-INTERVAL DOSING: Collect two levels post dose. One at 4-6 hours and the second at 12-24 hours post dose. The MD must indicate the exact date and time that the level should be drawn. Levels can be drawn in the phlebotomy lab area from 7 AM-3:30 PM, Monday through Friday only. If the time of the draw falls outside of this time, the MD must draw and time the sample. The time the sample is drawn must be on the label of the drug sample.

Reference:

Hammett-Stablen, C.A. and Daggupta, A.: Therapeutic Drug Monitoring Data: A Concise Guide. 3rd Edition, AACC Press, 2007

Therapeutic Drug Ranges

|  |  |  |
| --- | --- | --- |
| **Drug** | **Therapeutic** | **Critical** |
| Carbamazepine | 4.0 – 12.0 ug/mL | ≥12.0 ug/mL |
| Gentamicin | trough <2.0 ug/mL | trough ≥2.0 ug/mL |
| peak 8.0 – 12.0 ug/mL | peak ≥12.0 ug/mL |
| Phenytoin | 10.0 – 20.0 ug/mL | ≥20.0 ug/mL |
| Theophylline | 10.0 – 20.0 ug/mL | ≥20.0 ug/mL |
| Tobramycin | trough <2.0 ug/mL | trough ≥2.0 ug/mL |
| peak 8.0 – 12.0 ug/mL | peak ≥12.0 ug/mL |
| Valproic Acid | 50.0 – 120.0 ug/mL | ≥100.0 ug/mL |
| Vancomycin | trough 10.0 – 20.0 ug/mL | trough≥20.0 ug/mL |
| peak 30.0 – 40.0 ug/mL | peak ≥40.0 ug/mL |
| Digoxin | .8 – 2.0 ng/mL | ≥2.0 ng/mL |
| Lithium | .6 – 1.4 mEq/L | ≥1.6 mEq/L |
| Acetaminophen | 10 – 30 ug/mL | 150 -200 ug/mL (possible toxicity) |
|  | >200 ug/mL (probable toxicity) |
| Salicylate | <20 mg/dL | >30 mg/dL (toxic) |
|  | >60 mg/dL (lethal) |

1. CK-MB and Troponin I for MI Detection

Refer to doctor's orders for patients admitted to CCU with possible, impending or proven acute myocardial infarction.

CPK total Normal: 55-170 U/L

CK-MB Normal: 0-5.0 ng/mL

Relative Index: Normal: <3%

CKMB positive criteria for MI (all criteria must be met):

* A peaking of the CKMB Isoenzyme within 12-24 hours after the onset of pain.
* A peak value of CKMB Isoenzyme of 5.0 ng/mL or greater.
* A Relative Index % value of 3.0% or greater within 12-24 hours after the onset of chest pain.
* Total CK may not be elevated in 10-15% of acute MI cases. CKMB and Relative Index are not performed on CK Totals of 150 U/L or less. Both CKMB and TropI positive criteria must be met to be diagnostic of acute MI.

Troponin (cTn-I)

* Negative: <0.012 ng/ml Limit of Detection
* The 99th percentile Upper Reference Limit (URL) for cardiac troponin I (cTnI) will now be 0.034 ng/ml as recommended by the American Society of Cardiology and the American Heart Association. This value is based on 21 estimates of the URL using >10,000 serum and plasma samples from individual donors as well as our own laboratory normal range studies.

AMI – Criteria

A change of cTnI >30% when added to either the initial cTnI >0.034 ng/ml or follow up cTnI >0.034 ng/ml improves risk stratification for acute myocardial infarction (AMI) or death (p<0.001) (See Apple et al, Clin Chem 2009; 55:5, 930-937).

ACS – Criteria

Patients with symptoms and cTnI values between 0.012 ng/ml, the Limit of Detection (LoD), and 0.034 ng/ml, the 99th Percentile URL, should be fully evaluated for acute coronary syndrome (ACS).

CK-MB isoenzyme and Troponin I (cTn-I) are performed 24 hours/day, 7 days/week.

Refer to "CCU Protocol for CK-MB, cTn-I ". Copies available in Coronary Care Unit or Clinical Chemistry. On admission to CCU, CK-MB, cTn-I should be ordered. Collect CK-MB isoenzyme, cTn-I at 0, 6, 12, 24, and 48 hours.

Elevations of cTn-I (above the values established for non-AMI specimens) occur within 4-6 hr. after onset of chest pain, reach peak concentrations in approximately 12 hr., and remain elevated for as long as 83 to 144 hours following AMI. The temporal pattern of cTn-I release is similar to CK-MB but remains elevated longer. cTn-I is highly cardio-specific.

1. NT-proBNP for congestive heart failure

<300pg/mL (negative predictive value 98%)

When used for the evaluation of patients with acute symptoms in the emergency department setting, amino terminal pro-B-type natriuretic peptide (NT-proBNP) testing is highly sensitive and specific for the diagnosis or exclusion of acute destabilized heart failure (HF), with results comparable to those reported for B-type natiuretic peptide (BNP) testing.

BNP and NT-proBNP are cleaved from a common precursor peptide; however, there are considerable differences in the two analytes.  BNP is biologically active with a half-life of approximately 18 minutes and is rapidly cleared from the circulation, while NT-pro BNP is not biologically active and has a half-life of 60-120 minutes.  NT-Pro BNP is more stable in vitro (at least 22 hour) while BNP levels decrease significantly after 25 hour post collection.

Natrecor® (Nesiride) therapy does not interfere with the NT-proBNP assay results.

NT-proBNP was superior to BNP for predicting mortality and morbidity (P=0.032) or hospitalization for HF (P=0.0143) in a study by [Massen et al (Clin Chem 2006; 52:1528-1538](file://vhalexfpc20/service/public/Public%20-%20Pathology/CH%20-%20Chemistry%20with%20SCH/Supportive%20Documentation/BNP/Direct%20Comparison%20fo%20B-Type%20BNP%20and%20Amino-Terminal%20proBNP%20in%20Patients%20with%20Heart%20Failure%20(Masson).pdf)).

Studies indicate a dual use for NT-proBNP, both to exclude acute heart failure (HF) (where NT-proBNP concentrations <300 pg/ml have a 98% negative predictive value), as well as identify the diagnosis.  To identify acute HF in patients with dyspnea, an age-independent NT-proBNP cut point of 900 pg/ml has a similar value as that reported for BNP value of 100 pg/ml.  However, age stratification of NT-proBNP using cut points of 450,900, and 1,800 pg/ml (for age groups of <50, 50-75, and >75 years) reduces false negative findings in younger patients, reduces false-positive findings in older patients, and improves overall positive predictive value of the marker without a change in overall sensitivity and specificity.

Results of the International Collaborative of NT-proBNP (ICON) study (reviewed in [Januzzi et al, Am.J. Cardiol 2008; 1012 29A-38A](file://vhalexfpc20/service/public/Public%20-%20Pathology/CH%20-%20Chemistry%20with%20SCH/Supportive%20Documentation/BNP/Amino-Terminal%20proBNP%20for%20Diag%20or%20Exclusion%20of%20Acute%20Heart%20Failure%20(Januzzi).pdf)) support the efficacy of NT-proBNP in the evaluation of patients with suspected acute congestive heart failure.

Below is an excerpt from this study:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Optimal Cut Point (pg/ml) | Sensitivity  (%) | Specificity  (%) | Positive Predictive Value (%) | Negative Predictive Value (%) | Accuracy  (%) |
| Rule-in cut points |  |  |  |  |  |  |
| <50 yrs old | >450 | 97 | 93 | 76 | 99 | 94 |
| 50-75 yrs old | >900 | 90 | 82 | 83 | 88 | 85 |
| >75 yrs old | >1800 | 85 | 73 | 92 | 55 | 83 |
| Rule in, overall |  | 90 | 84 | 88 | 66 | 85 |
|  |  |  |  |  |  |  |
| Rule-out cut point |  |  |  |  |  |  |
| All patients | <300 | 99 | 60 | 77 | 98 | 83 |

When utilizing the NT-proBNP rule-in cut points listed above, further adjustment for impaired renal function is typically not required (Am. J. Cardiol 2008; 101: 82-88A).

1. **Glucose Tolerance Testing**
2. Principle

Either the fasting plasma glucose or random plasma glucose should be obtained when considering the diagnosis of diabetes. Clinicians observe the response of a patient to an oral dose of glucose (beverage form) over a period of 2-3 hours. A fasting specimen is drawn, oral glucose administered, and blood is collected at regular intervals. Each specimen is then analyzed for glucose content. Diet restrictions require the glucose tolerance test to be started as early in the morning as possible (approximately 8 am).

1. Collection / Specimen Handling

Serum, plasma, and whole blood have essentially similar glucose concentrations. When blood is allowed to stand without a preservative at room temperature, the glucose is metabolized at ~5% per hour, resulting in a falsely decreased value. Thus, the specimen is centrifuged and processed immediately after collection.

1. Discontinuing the Glucose Tolerance Test

If the fasting plasma glucose is **≥**126, the glucose beverage should **NOT** be administered and the test canceled and the ordering physician notified. In addition, vomiting of the ingested glucose during the first hour will invalidate results and the test is to be canceled. Should the patient become ill during the testing, he/she should be taken to the AEU or their Primary Care physician for evaluation. The provider requesting the glucose tolerance test is to be notified.

1. Diagnostic Criteria

The following criteria established by the American Diabetes Association should be used, along with the physical exam, for the diagnosis of diabetes.

1. Symptoms of diabetes plus random plasma glucose concentration **≥**200 mg/dl. Random is defined as any time of day without regard to time since last meal. The classic symptoms of diabetes include polyuria, polydipsia, and unexplained weight loss.

or

1. Fasting plasma glucose **≥**126 mg/dl. Fasting is defined as no caloric intake for at least 8 hours. This test should be repeated on a successive day and if the second fasting plasma glucose is ≥126, diabetes is highly probable.

or

1. Two-hour post load glucose ≥200 mg/dl during an Oral Glucose Tolerance Test. The test should be performed as described by the World Health Organization, using a glucose load containing the equivalent of 75 g anhydrous glucose dissolved in water.
2. Interpretation of Results
3. Fasting Glucose Test

Normal fasting glucose: 74 - 106 mg/dl

Impaired fasting glucose: 106-125 mg/dl

Provisional diagnosis of diabetes: **≥**126 mg/dl (preferably the diagnosis can be confirmed by repeat fasting glucose testing on successive day or by OGTT).

1. Two hour Oral Glucose Tolerance Test

Normal Glucose Tolerance: 2-hour post load glucose <140 mg/dl

Impaired Glucose Tolerance: 2-hour post load glucose 140-199 mg/dl

Provisional diagnosis of diabetes: 2-hour post load glucose **≥**200 mg/dl

NOTE: Patients with Impaired Fasting Glucose or Impaired Glucose Tolerance are referred to as having “pre-diabetes” indicating the relatively high risk for development of diabetes.

f. Diagnosis of Gestational Diabetes Mellitus

These patients should have a 2-hour Glucose Tolerance Test performed, which includes a fasting, 1 hour, and 2 hour collection. The following information should be used in diagnosing GDM using a 75 g glucose load.

|  |  |
| --- | --- |
| Fasting | 95 mg/dl |
| 1-hour | 180 mg/dl |
| 2-hour | 155 mg/dl |

Two or more of the glucose concentrations must be met or exceeded for a positive diagnosis. The test should be done in the morning after an overnight fast of 8-14 hours and at least 3 days of unrestricted diet (**≥**150g carbohydrate per day) and unlimited physical activity.

1. Cortrosyn Stimulation Test

The Cortrosyn test is done to evaluate adrenal reserve. A fasting blood sample is drawn for plasma cortisol measurement. A dose of 0.25 mg Cortrosyn is given intramuscularly. Blood is drawn at timed intervals for plasma cortisol determination (examples: 15 min, 30 min, 45 min, 60 min, 90 min).

1. Intact PTH (also orderable as IntraOperative PTH)- EDTA plasma

Normal Range 7.5-53.5 pg/mL

The primary role of PTH is to maintain calcium homeostasis via its interaction with calcitonin. PTH measurement is an important aid in the diagnosis of disorders of calcium metabolism. PTH synthesis and secretion are triggered rapidly by low concentrations of ionized calcium (Cai). The biological activities of PTH are to increase absorption of dietary calcium, decrease renal clearance and mobilize skeletal calcium stores. Abnormally high Cai concentrations suppress secretion of PTH.In conjunction with serum calcium levels, the PTH assay may be used as an aid in the differential diagnosis of hypercalcemia, hypocalcemia and parathyroid disorders. PTH determination is important in monitoring dialysis patients to manage renal osteodystrophy.

Guidelines from the National Academy of Clinical Biochemistry recommend the use of intraoperative parathyroid hormone testing for patients during surgery for hyperparathyroidism, especially in minimally invasive or directed procedures, as well as for patients undergoing reoperation. For patients undergoing parathyroidectomy it is recommended that preoperative and pre‑excision samples are taken. Samples should also be drawn at 5 and 10 minutes post resection and a >50% reduction in PTH levels from the highest baseline may be used as criteria for surgical success.

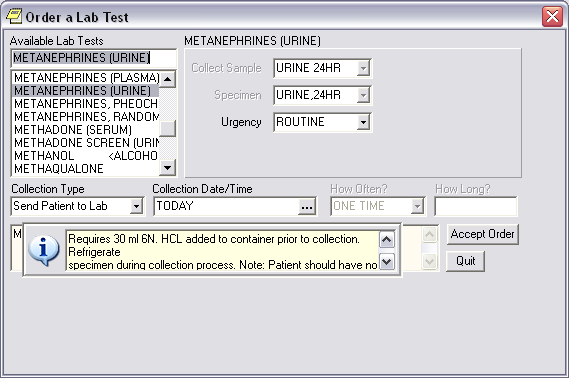
1. Urine Collection

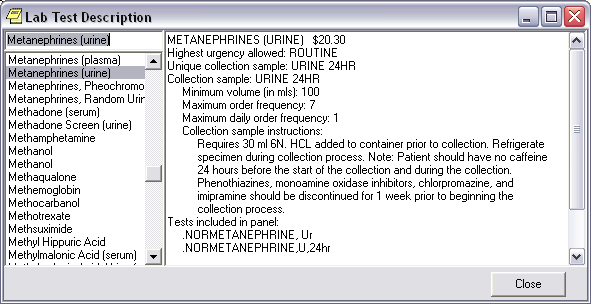
Urine tests performed in house with reference ranges:

|  |  |
| --- | --- |
| **URINE TEST** | **REFERENCE RANGES** |
| URINE Microalbumin | <16.6 mg/L |
| URINE Malb/Creat Ratio | Normal <30 ug/mg creatinine |
| Microalbuminuria 30-300 ug/mg |
| Clinical albuminuria >300 ug/mg |
| URINE PROTEIN(24 hr.) | 42 – 225 mg/24hr |
| URINE PROTEIN(random) | <12 mg/dl |
| URINE SODIUM(24 hr.) | 40 – 220 mEq/24hr |
| URINE SODIUM(random) | 30 – 90 mmol/L |
| URINE POTASSIUM(24 hr.) | 25 – 125 mmol/24hr |
| URINE CHLORIDE(24 hr.) | 110 – 250 mEq/24hr |
| URINE CREATININE(24 hr.) | 800 –2800 mg/24hr |
| URINE BUN(24 hr.) | 12 –20 g/24hr |
| URINE GLUCOSE(24 hr.) | <500 mg/24hr |
| URINE GLUCOSE(random) | <30 mg/dL |
| URINE AMYLASE(24 hr.) | 32 – 641 U/L |
| URINE PHOSPHORUS(24 hr.) | 400 – 1300mg/24hr |
| URINE URIC ACID(24 hr.) | 250 –700 mg/24hr |
| URINE MAGNESIUM(24 hr.) | 73 – 122 mg/24hr |
| URINE CALCIUM(24 hr.) | 50 – 150 mg/24hr |

Timed specimens, such as those for uric acid, should be refrigerated during collection and collected in brown plastic jugs obtained from SPD. Volumes will be measured on all timed urine specimens and reported with the results of the test.

Those ordering or performing urine collections should be careful to note the specimen’s preservative requirements. These requirements are displayed as a ‘Ward Instruction’ in the VistA/CPRS lab test order dialog. Preservatives are also stated in the VistA/CPRS Lab Test Description information. **(Preservatives, for urine specimen collection must be added, to the container, by the laboratory.)**





## DRUG INTERFERENCE WITH LABORATORY TESTS

The average hospitalized patient is taking six different medications, any of which may interfere with laboratory tests. An unexpected laboratory result may be due to drug interference with the test procedure. The scope of the problem precludes a complete list of drugs, which interfere with specific tests; however, several excellent references are available and are listed as follows:

a. Sunderman, Jr., F.: Drug Interference in Clinical Biochemistry. CRC Critical Reviews in Clinical Laboratory Science, July, 1970, pp. 427-449.

b. Young, D.S., et al Effects of Drug on Clinical Laboratory Tests. Clinical Chemistry, 18, 1041-1303, 1972.

c. Young, D.S., et al Effects of Drugs on Clinical Laboratory Tests. Clinical Chemistry, 12, 10-432D, 1975.

d. Friedman, R.B.: Effect of Disease on Clinical Laboratory Tests. Clinical Chemistry, 26, No. 4, 1980.

## CRITICAL VALUES

Chemistry Specific Panic or Toxic Test Results

The following list of panic or toxic values must be promptly released and then called to the provider responsible for the patient’s care. Hemolysis should also be conveyed to the physician if it is known to affect the test results.

Values listed have been established in association of the Chief of Staff’s office.

| **Chemistry Critical Values** | **CRITICAL LOW** | **CRITICAL HIGH** |
| --- | --- | --- |
| DIGOXIN |  | ≤2.0 ng/mL |
| GLUCOSE | ≤ 50 mg/dl | ≥500 mg/dl |
| SODIUM | ≤115 mmol/L | ≥160 mmol/L |
| POTASSIUM | ≤2.5 mmol/L | ≥6.1 mmol/L |
| CHLORIDE | ≤70 mmol/L | ≥ 125 mmol/L |
| CO2 | ≤15 mmol/L | ≥40 mmol/L |
| CALCIUM | ≤6.0 mg/dl | ≥12 mg/dl |
| PHOSPHORUS | ≤1.0 mg/dl |  |
| TOTAL PROTEIN |  | ≥15 g/dl |
| ALBUMIN |  | ≥10g/dl |
| LITHIUM |  | ≥1.6 mEq/L |
| MAGNESIUM | ≤1.0 mg/dl |  |
| TRIGLYCERIDE |  | ≥2000 mg/dl |
| THEOPHYLLINE |  | ≥20.0 ug/mL |
| GENTAMICIN PEAK/TRO | tr≥2.0 ug/mL | pk ≥12.0 ug/mL |
| TOBRAMYCIN PEAK/TRO | tr >2.0 ug/mL | pk ≥12.0 ug/mL |
| CARBAMAZEPINE |  | ≥12.0 ug/mL |
| VANCOMYCIN PEAK/TRO | tr >20.0 ug/mL | pk >40.0 ug/mL |
| IONIZED CALCIUM | ≤0.75 mmol/L | ≥1.5 mmol/L |
| VALPROIC ACID |  | ≥100.0 ug/mL |
| ETHYL ALCOHOL |  | ≥300 mg/dl |
| ACETAMINOPHEN |  | >200 ug/mL |
| SALICYLATE |  | >30 mg/dl |
| TROPONIN\* |  | ≥0.034 ng/mL |
| PSA\*\* |  | ≥ 4.0 ng/mL |
| TSH\*\* |  | ≥10.0 uIU/mL |

\*called to ED only

\*\*flagged but not called

## SPECIAL PROCEDURES REFERRED TO OUTSIDE LABORATORIES

Procedures not available within the medical center complex are sent to outside laboratories. All specimens for such outside procedures MUST be sent to the central laboratory from which they will be mailed and to which reports will be returned.

# HEMATOLOGY

LOCATION: B-102

PHONE: Ext. 4515

HOURS OF OPERATION: 24 hrs./day, 7 days/week

SECTION DIRECTOR: David Hunt, M.D., PH.D., Ext. 4497

SUPERVISOR: Lee Ann Speaks, B.S., M.T., (ASCP)

LEAD MEDICAL TECHNOLOGIST: Susan Buchanan, B.S., M.T. (ASCP)

## SPECIMEN ACCEPTIBILITY

All hematology procedures need to be performed on fresh, appropriately anticoagulated specimens. The proper ratio of blood to anticoagulant is also of the utmost importance. If the specimen is too old or over anticoagulated, artifactual changes occur in RBC size and morphology. This may invalidate the profile results and blood smear evaluation. Therefore, all purple top (EDTA) tubes should contain 4.0 ml (volume) of blood and should be delivered to the lab as soon as possible after collection.

* All specimens must have the time of collection on the specimen label.
* Sed Rates must be performed on blood less than 2 hours old (room temp) or less than 24 hours old(refrigerated).
* Reticulocyte count must be performed on room temperature blood less than 24 hours old or refrigerated blood less than 72 hours old.

## COMPLETE BLOOD COUNTS

1. Ordering

When a CBC/PLT is ordered, the appropriate test (CBC/Platelets and, if desired, differential) should be entered in the VISTA.

1. Profiles

The Sysmex counts and sizes red blood cells (RBC) and platelets (PLT) using electronic resistance detection enhanced by hydrodynamic focusing. Hematocrit (HCT) is measured as the ratio of the total RBC volume to whole blood using cumulative pulse height detection. Hemoglobin (HGB) is converted to SLS-hemoglobin, and read photometrically.

WBC count, differential, reticulocytes (RET) and nucleated red blood cells (NRBC) are all evaluated using flow cytometry with a semiconductor laser exploiting the differences in cell size, complexity and RNA/DNA content. WBC and basophils (BASO) are treated with an acidic lyse that lyses RBC and WBC, but not BASO. The remaining WBC nuclei and intact BASO are differentiated by cell size and internal cell structure. The WBC differential channel classifies lymphocytes (LYMPH), monocytes (MONO), eosinophils (EO), granulocytes, and immature granulocytes (IG) by cellular complexity and nucleic acid content. The differential cell placement is then enhanced using Adaptive Cluster Analysis. Reticulocytes are separated from mature RBC and PLT by size and RNA content. NRBC are separated from WBC based on nuclear size after lysing and DNA/RNA staining.

Lipemic specimens and specimens with greatly elevated WBC counts will be corrected accordingly.

1. Differentials

Since it is very time consuming to perform manual differential counts, a manual differential should only be ordered when medically necessary. Only one (1) differential per day will be performed per patient unless there is significant change in WBC counts. Per policy, an Automated Differential will be performed on all outpatient specimens when the WBC count is less than 3,000 or greater than 15,000 regardless of whether a differential was ordered. On patient specimens with WBC counts of less than 3,000 WBC/cmm, fewer than 100 cells may be counted, at the discretion of the supervisor. The physician may request a 100 cell differential on such specimens; however, if the count is sufficiently decreased a buffy coat smear may be required to obtain a complete count.

## COLLECTION OF BODY FLUIDS FOR CELL COUNTS

Cell counts on clear CSF will only be accepted in screw-cap culture tubes without swabs. All other body fluids for cell counts will only be accepted in purple top (EDTA) tubes. Fluid crystal examinations require a plain green top (heparin) tube.

## DILUTION PROCEDURES

WBC Count: When the WBC from the Sysmex is >495000, a dilution is made and run on the Sysmex.

## REPORTING

1. Routine Reports will be available via the VISTA as soon as the results are verified by the technologist.
2. STAT (emergent) Reports will be automatically printed on the ward as soon as the tests are completed.
3. Critical Values:

* Hemoglobin <6 or >18 mg/dl
* Hematocrit <22% or >54%
* WBC Count <1500 or >30,000/cmm
* Platelets <20,000 or >1,000,000/cmm

## HEMATOLOGY TESTS PERFORMED ON A "STAT" BASIS

* CBC Profile
* WBC Count
* Platelet Counts
* Hemoglobin
* Hematocrit
* RBC Counts
* Fluid Counts

Automated Reticulocyte Counts are available 24 hr/day (not STAT)

# COAGULATION

LOCATION: B-102 (SUB-SECTION OF HEMATOLOGY)

PHONE: Ext. 5199

HOURS: 24 hrs/day, 7 days/week

STAFF PATHOLOGIST: David Hunt, M.D., Pathology & Laboratory Med. Service

SUPERVISOR: Leeann Speaks, B.S., M.T. (ASCP)

LEAD MEDICAL TECHNOLOGIST: Susan Buchanan, B.S., M.T. (ASCP)

## SPECIMEN COLLECTION

The blue top (Sodium Citrate) tube used for Coagulation contains sufficient sodium citrate for proper anticoagulation of a completely filled tube (2.7 ml). The correct ratio is 9:1 of blood to anticoagulant. This ratio is critical. If the ratio is varied, a false prolongation or shortening of clotting times may result because the fixed amount of calcium used in coagulation procedures will not provide optimal conditions and/or excessive dilution.

NOTE: Collection of blood for coagulation testing through intravenous lines that have been previously flushed with heparin should be avoided, if possible. If the blood must be drawn through an indwelling catheter, possible heparin contamination and specimen dilution should be considered. When obtaining specimens from indwelling lines that may contain heparin, the line should be flushed with 5 mL of saline, and the first 5 mL of blood or 6-times the line volume (dead space volume of the catheter) be drawn off and discarded before the coagulation tube is filled.

Since coagulation factors decrease rapidly at room temperature, it is essential that all specimens be brought to the laboratory as soon as possible. All Factor Assays and Special Coagulation Tests, except those for FPS, should be kept in ice.

To avoid the transfer of anti-coagulants, it is also best to draw heparin or EDTA anti-coagulant tubes AFTER the blue top collection tube.

## AVAILABILITY OF TESTS

PT, APTT, D-Dimer, and Fibrinogen are available on a 24 hour basis.

## CRITICAL VALUES

Fibrinogen < 70 mg/dl

PT > INR 5.0

APTT > 90 sec.

## DIRECTIONS FOR SPECIAL COAGULATION TESTS SENT TO UK

1. PLATELET FUNCTION ANALYSIS
2. Must be scheduled with UK Coagulation. Phone # 7-71377.
3. Slips must be coded and sent with patient.
4. SPECIFIC FACTOR ASSAYS
5. Collect blue top tube and send to lab as soon as possible.

# URINALYSIS

LOCATION: B-102 (Sub-section of Hematology)

PHONE: Ext. 5199

HOURS: 24 hrs/day, 7 days/week

STAFF PATHOLOGIST: David Hunt, M.D., Pathology & Laboratory Med. Service

SUPERVISOR: Leeann Speaks, B.S., M.T. (ASCP)

LEAD MEDICAL TECHNOLOGIST: Susan Buchanan, B.S., M.T. (ASCP)

## GENERAL INFORMATION

During the course of a single day, the composition of the urine is constantly changing. Accordingly, various types of urine specimens are used for analysis. A list of various types of urine collection follows.

1. RANDOM OR SPOT SPECIMEN: Void at any time of the day or night, and collect a portion of the urine in a clean container.
2. FASTING SPECIMEN: Void four or more hours following the ingestion of food and discard the specimen. Collect the next voided specimen.
3. FIRST MORNING SPECIMEN: Void before retiring and discard the specimen. On arising in the morning, collect the first voided specimen.
4. 24 HOUR SPECIMEN: On arising in the morning, void and discard specimen, record the time. Collect all urine excreted during the next 24 hours (day and night) and pour it into the large container provided. Keep the large container in the refrigerator. Exactly 24 hours after the first voiding, void again, SAVE IT, and add it to the large container. The large container now represents 24 hour specimen. Some 24 hour urine specimens may need a preservative added. Check specific test for information.
5. MIDSTREAM SPECIMEN: Have a clean collection container at hand. Initiate urination. When approximately half of voiding is completed, without interrupting the process of urination, a portion of urine is collected in a container and then the latter portion of the urine flow is discarded as usual.
6. CLEAN CATCH SPECIMEN: For either males or females, the external genitalia are washed using a mild antiseptic solution. Midstream urine is then collected in a clean, sterile container. Should be used for all specimens collected for any tests ordered as “Urinalysis with reflex to culture.”

The great majority of urine specimens, which are used for urinalysis, are simply random specimens. The composition of a random voided specimen may vary quite widely. However, some simple rules for handling the specimens minimize this variance.

## URINALYSIS TESTING

Handling of urinalysis orders and specimens:

* 1. Routine urinalysis - microscopic analysis would only be performed on those specimens showing significant findings in the visual and/or chemical analysis. Otherwise, no microscopic analysis will be performed.
  2. Urines should be brought to the laboratory immediately, as both microscopic and chemical changes may occur. All routine urine specimens must be received in the lab within 1 hour of collection or refrigerated until testing is available.
  3. Urine should be collected in clean container, capped to prevent spillage, and should be clearly labeled with the patient's name, social security number, order number, and time of collection.

1. At least 10 ml of urine is required for urinalysis. All urine specimens submitted for urinalysis testing must be in screw cap container. Urine microbiology culture transport tubes are not acceptable for urinalysis.

## URINALYSIS WITH REFLEX TO CULTURE

Provider lab orders for URINALYSIS WITH REFLEX TO CULTURE will yield urinalysis results *AND* trigger (“reflex”) a follow-up urine microbiology culture ***ONLY*** if indicated by the results of the urinalysis chemical/microscopic exam.

Reflex culture testing will be completed if any of the following criteria are met:

Nitrite = positive

Leukocyte esterase = ≥ small

WBC = ≥ 5/hpf

Bacteria = ≥1+

Specimen integrity must remain sterile for possible culture and sensitivity.

1. Specimen collection:

10 mL clean catch urine in sterile container (minimum 4 mL).

Refrigerate (2-8 C) if testing is delayed for > 2 hours.

1. CBOC specimen collection:

Submit specimens appropriate for both the routine urinalysis and urine culture. Refer to individual test listing for requirements.

1. 15 mL urine submitted in urinalysis preservative/transport tube (minimum 4 mL volume). Stable for 72 hours.
2. 5 mL urine in urine culture tube (gray-top)  (minimum 4 mL volume).

# MICROBIOLOGY

LOCATION: B-114

TELEPHONE: EXT. 4522

HOURS OF OPERATION: 24 hours/day, 7 days/week

SECTION DIRECTOR: Laura Crump, M.D., Ext. 5939

SUPERVISOR: Rebecca Haynes, B.S., M.T. (ASCP), Ext. 4523

LEAD MEDICAL TECHNOLOGIST: Benny Foley, B.S., M.T. (ASCP), Ext. 4523

## BACTERIOLOGY- AVAILABILITY OF TESTS AND RESULTS

1. Anaerobic Cultures
2. Anaerobic cultures are performed on all wounds and body fluids from normally sterile sites as part of the routine culture request.
3. Anaerobic cultures will not be performed on the following specimens:
   * Throat
   * Nasopharynx
   * Sputum, unless obtained by transthoracic aspiration.
   * Bronchoscopic specimens unless obtained by triple lumen bronchoscope brush.
   * Feces or rectal swab
   * Urine, unless obtained by percutaneous bladder puncture
   * Vaginal or cervical specimens
   * Specimens reaching the Microbiology section later than 30 minutes after collection if not in anaerobic transport medium.
4. Antimicrobial Susceptibility Testing
5. Bacteria isolated from routine and blood cultures will be tested to determine antimicrobial susceptibility patterns.
6. Staphylococci will be tested against the following antibiotics:

Ciprofloxacin

Clindamycin

Daptomycin

Erythromycin

Gentamicin

Levofloxacin

Linezolid

Moxifloxacin

Oxacillin

Penicillin

Rifampin

Tetracycline

Trimethoprim/Sulfamethoxazole

Vancomycin

1. Enterococci will be tested against the following antibiotics:

Amoxicillin/K Clavulanate

Ampicillin/Sulbactam

Ampicillin

Ceftriaxone

Ciprofloxacin

Clindamycin

Daptomycin

Erythromycin

Gentamicin

Levofloxacin

Linezolid

Moxifloxacin

Nitrofurantoin

Oxacillin

Penicillin

Rifampin

Synercid

Tetracycline

Trimethoprim/Sulfamethoxazole

Vancomycin

Gentamicin Synergy Screen (systemic isolates only)

1. Gram-negative organisms will be tested against the following antibiotics:

Reported Selectively:

Amikacin

Amoxicillin/K Clavulanate

Ampicillin/Sulbactam

Ampicillin

Aztreonam

Cefazolin

Cefepime

Cefotaxime

Ceftazidime

Ceftriaxone

Cefuroxime

Cephalothin

Ciprofloxacin

Ertapenem

Gentamicin

Imipenem

Levofloxacin

Nitrofurantoin

Piperacillin/Tazobactam

Tetracycline

Ticarcillin/K Clavulanate

Tobramycin

Trimethoprim/Sulfamethoxazole

Trimethoprim

1. Streptococccus isolates will be tested against the following:

Azithromycin

Cefotaxime

Ceftriaxone

Cefuroxime

Levofloxacin

Penicillin

Tetracycline

Trimethoprim/Sulfamethoxazole

1. Beta-hemolytic Streptococci

Beta-hemolytic Streptococci are intrinsically susceptible to Penicillin. Susceptibilities will be performed by request only.

1. Isolates from normally sterile body fluids will be tested using a minimal inhibitory concentration (MIC) determination procedure. This MIC procedure will also be used to test anaerobic isolates.
2. Blood Cultures
3. Blood cultures may be submitted 24 hours a day, 7 days a week.
4. Each bottle is examined at ten minute intervals by an automated instrument. If a positive culture is detected and confirmed either by smear or by routine subculture, the physician will be notified immediately. After the organism has been identified and/or an antibiogram established, results will be available via computer. When identification is completed, a final report will be available in VISTA/CPRS.
5. Blood culture bottles will be held for 5 days before being reported as negative.
6. ROUTINE CULTURES
7. Specimens are placed on culture media 24 hours a day, 7 days a week. However, it must be emphasized that the house staff and nursing service should limit the submission of specimens during the evenings, nights, and weekends to those which are necessary. During the above periods, the laboratory service operates with a reduced staff.
8. Preliminary reports are available by computer daily.
9. Final reports will usually be available in VISTA/CPRS in a time frame of 48-96 hours.
10. Gram Stains
11. Gram stain smears are made on all specimens except throat, stool, and urine. Urine will be gram-stained upon specific request. The smears are stained in batches and read daily.
12. Two exceptions to this procedure are: (1)
13. CSF smears which are stained and read immediately; (2) Sputum smears are stained and examined for the presence of leukocytes and epithelial cells to determine the acceptability of the specimen for culture. If the specimen is acceptable, the smear will be examined for the presence of microorganisms.
14. If a gram smear result is needed to determine whether a patient is to be admitted, please indicate so by phone request and the smear will be stained immediately.
15. India Ink Preparations
16. India ink preps are done on all CSF specimens submitted for culture.
17. Mycobacteriology And Mycology

Specimens submitted for AFB smear and/or culture will be processed daily by a reference lab, during the 8:00 - 4:30 p.m. shift. Specimens received in the laboratory before 2:00 p.m. will be processed that day, while those received after that time will be processed on the next morning.

Since sputum and urine specimens submitted for culture should be the first morning specimens, the 2:00 p.m. deadline should be no problem for most of the specimens submitted for these types of cultures.

All specimens may be submitted at any hour of the day, 7 days a week and they will be processed the next morning, including weekends.

The laboratory will notify the physician when an AFB smear and/or culture is positive. The isolate will be identified by the reference lab as M. tuberculosis or M. avium intracellulare using a DNA probe. Other species are identified by nucleic-acid sequencing. Susceptibility studies will be performed on all isolates.

Specimens for fungal culture are processed 24 hours a day, 7 days a week. Fungal isolates are sent to a reference laboratory for identification.

1. Parasitology

Specimens will be accepted for parasitology examinations 24 hours a day, 7 days a week and are sent to a reference laboratory for processing. Parasitology reports are usually issued within 24 to 72 hours.

1. Special Instructions For Requesting Parasitic Serology Or Viral Isolation
2. Parasitic serological studies are performed by the commercial reference laboratory used by P&LMS. Specimens should be submitted as routine serology specimen to the Microbiology Section.
3. Virus isolations are performed either by the UK Microbiology Laboratories or by the commercial laboratory utilized by the Pathology and Laboratory Medicine Service. All virus culture specimens require special handling and transport. Please consult the Microbiology Section for proper instructions on collection and transport of such specimens.

## SPECIMEN COLLECTION & REPORTING

The results of a microbiological test can be no better than the specimen on which it was performed. Therefore, the laboratory must rely on the nurses and house staff to collect the specimen in accurate and standardized manner. The welfare of the patient rests not only on the laboratory analysis and the physician's interpretation, but also on the way in which the specimen was obtained and transmitted to the laboratory. There are many variables involved in adequate handling of specimens and all must be considered separately to avoid critical errors. Factors that must be considered are: Time of collection, labeling and handling of containers, quantity of specimen, moisture, transportation, temperature, and atmosphere.

1. Time of Collection

Specimens must be taken, if possible, before antibiotics are administered. For example, the timing of blood specimens is very important. A positive blood culture depends on the pathogenic process of the organism.

With some diseases, bacteremia occurs only in the early stages of the infection, while in other cases there is continuous presence of bacteria. In many cases, the presence of bacteria in the blood is transient and can best be found after a chill when the patient spikes a fever. During a chill, the bactericidal properties of blood are accentuated, and the micro vessels constrict and become clogged with cells and bacteria during the chill.

1. Labeling and Handling Containers

All containers used for specimen collection must be sterile. The patient should be instructed to handle the container as aseptically as possible (i.e., not to touch the inside of the container, not to leave the lid off for an excessive length of time, etc.) If any of the specimen is spilled on the outside, it should be immediately cleaned with a disinfectant. The lid should be secured tightly and the container transported with care to insure against spillage. All containers must be labeled clearly with the patient's name, social security number, source of specimen, and order number. It is necessary that the specimen label include the time specimen was collected and any special information about collection. Per policy, mislabeled specimens will be recollected unless the specimen “cannot be recollected and is vital to patient care or if recollection poses significant risk to the patient.” If a specimen is accepted, a disclaimer must be placed in the accession’s comments.

1. Quantity of Specimen

Specimens should be of sufficient quantity to complete the examination requested.

1. Moisture

Specimens to be submitted to the microbiology laboratory should be moist. Most bacteria, especially the pathogenic ones, cannot survive in a dry environment. So when a specimen is taken, be sure the swabs are moist from the specimen, and remain moist by placing the swabs in the Culturette container. The Culturette container contains a fluid transport medium, which will keep the bacteria alive and moist.

1. Effect of Temperature

Most of the microorganisms found in clinical specimens have optimal temperature of 37oC and have a broad range of temperature tolerance; however, some very important pathogens die rapidly when subjected to temperatures below their optimal requirements. Therefore, it is best never to refrigerate any specimen, especially spinal fluids and vaginal and urethral discharge, but deliver them immediately to the laboratory.

1. Effect of Atmosphere

The atmosphere plays a very important role in isolating and identifying pathogenic bacteria. The two principal gases that affect metabolism of the bacteria are oxygen and carbon dioxide. Some bacteria require oxygen, some require small amounts with varying concentration of carbon dioxide, and anaerobes must have an atmosphere completely devoid of any trace of oxygen. It is important to transport specimens for culture to the laboratory immediately. Anaerobic collection containers are available from SPD. If an anaerobic medium is not used, anaerobic organisms should be placed in an oxygen free environment within 20 minutes after collection.

1. Transportation

Special transport media is available for specimens submitted for anaerobic cultures (SPD), for specimens collected on swabs (SPD) and for viral (laboratory) and chlamydial cultures (laboratory). These media will allow for a reasonable delay (1-2 hours)) in transporting the specimens to the laboratory. Even using the special transport devices, the best rule to follow for microbiological specimen is to take them immediately to the laboratory to avoid the deleterious effects of drying, temperature and atmosphere described above.

## CLINICAL SPECIMENS FOR CULTURE

1. Blood
2. Time and Number of Cultures to be collected.

Bacteremia is often continuous in the case of intravascular infections such as endocarditis, in severe uncontrolled infections, and in the acute phases of infections of the reticuloendothelial system. In these situations, it is apparently unimportant whether several blood cultures are taken within a brief period or whether they are spaced over a longer time. The determining factor is the clinical urgency of the situation and the need to collect samples before treatment begins. In other cases, bacteremia is intermittent and may precede episodes of fever and chills by 1 hour. In such situations, collections of blood cultures should be spaced at intervals, with some being collected at the first sign of fever. Studies have shown that single blood cultures only detect 90% of all cases of bacteremia and that greater than 99% of all bacteremias are detected using three blood cultures drawn from different sites within a 24 hour period. Good medical practice requires that limits be set upon the number of blood cultures submitted for microbiological evaluation. The Clinical Microbiology Section, Pathology and Laboratory Medicine Service, will accept a maximum of four blood cultures within a 24 hour period. Submission of more than four sets within a 24 hour period will result in a consultation from the Clinical Microbiology Section. In addition, no more than six blood cultures may be submitted on a patient without consultation with the Clinical Microbiology Laboratory.

A general guide to blood culture collection in adults is as follows:

##### For severe life-threatening clinical septicemia: two sets of blood taken by separate venipuncture (preferably one set from each arm) should be collected immediately before starting treatment;

##### For low grade intravascular infection: three sets of blood cultures should be taken within the first 24 hours. These should include two collected at the earliest sign of a febrile episode;

##### For suspected bacteremia of unknown origin in patients already on therapy: if therapy cannot be suspended for a few days, four to six sets of cultures should be drawn within the first 48 hours. Cultures should be taken immediately before the next dose of antimicrobial agent if the patient is receiving intermittent parenteral therapy.

1. Skin Preparation and Collection of Blood

When the optimal venipuncture site has been selected, careful attention to skin disinfection is essential to reduce the incidence of contaminated blood cultures. Skin disinfection is performed exclusively with Chloraprep® (2% chlorhexidine gluconate and 70% isopropyl alcohol). Scrub the venipuncture site with the Chloraprep® applicator for 30 seconds and allow the Chloraprep® to dry completely. The rubber septum of the blood culture bottles are swabbed with a separate Chloraprep® applicator and allowed to dry completely before injecting blood. Once disinfected, the venipuncture site should not be probed with a finger unless it has been similarly decontaminated or unless sterile surgical gloves are worn. Blood should be drawn with a butterfly set connected to a venipuncture adapter cup and transferred into an aerobic and anaerobic blood culture bottle. Using the fill indicator lines on the label of the blood culture bottle, obtain 8-10ml of blood into the blue bottle (aerobic) and into the purple bottle (anaerobic). The blue bottle should always be drawn first. The butterfly needle is inserted directly into the vein. If the vein is missed, and a second venipuncture is required, a new transfer set should be used. These procedures are designed to reduce the risk of contamination with skin flora.

When multiple blood tests are ordered along with blood cultures, the skin should be disinfected as described above and the blood culture bottles should be collected first, prior to collecting specimens for the other tests.

1. Urine
2. Cleansing Procedures
3. Females:

After the patient has thoroughly washed her hands, have her separate the folds of the urinary opening (labia) with the thumb and forefinger and clean between the folds with a sterile towelette, using downward strokes only. Keeping the folds of the labia spread open, urinate a small amount into the toilet and then stop the flow of urine. Hold the cup a few inches from the urethra and urinate until the cup is about half full. Place the lid back onto the specimen, taking care not to touch the inside of the lid or cup. Deliver the specimen to the laboratory as soon as possible.

1. Male:

After the patient has thoroughly washed his hands, have him wash the tip of the glans penis with the sterile towelette. If uncircumcised he should retract the foreskin before cleansing the tip of the penis. The urethra is then flushed by the first portion of urine and a midstream specimen is collected in a sterile container. The lid should be placed on the container, taking care not to touch the inside of the lid or cup. Deliver the specimen to the laboratory as soon as possible.

1. Time of Collection

The best specimen for culturing is the first morning voided urine.

Urine makes a nice growth medium for bacteria; therefore, if skin contaminants or feces contaminants happen to get into the specimen and are allowed to grow, they may cause erroneous results. It is important that the time of specimen collection is marked on the patient's specimen container and the specimen be transported to the laboratory as soon as possible after collection.

1. Urine Specimens for Tuberculosis Culture

Collect the first voided morning specimen only. Twenty-four hour specimens will not be processed. At least 3 first morning specimens should be submitted. Time of specimen collection must be marked on the specimen container.

1. Urine Specimens for Anaerobic Culture

Catheterized urines and clean catch urines will not be processed for anaerobic culture. Anaerobic cultures will be performed on urines obtained by percutaneous bladder puncture and submitted in anaerobic transport media. The specimen container must be marked suprapubic urine and the time of collection must be indicated. Deliver the specimen to the laboratory as soon as possible.

1. Sputum
2. Specimens for Tuberculosis, Fungus, and Routine Culturing

Most pathogens causing upper respiratory tract infections are found in the sputum. For a sputum sample to be useful though, it must come from deep within the lungs as opposed to expectoration of saliva and nasopharyngeal secretions. A first morning specimen of sputum is best for culturing. If the patient cannot expectorate sputum, then the doctor should be notified. The specimens will be screened microscopically to determine if they are acceptable for culture. Twenty-four hour specimens will not be accepted for any type of culture. When a specimen is obtained, send it directly to the laboratory. Make sure the patient has the proper instructions for handling the container aseptically. Anaerobe cultures are never performed on sputum specimens. Transtracheal aspirations, bronchial brushings, using a triple lumen bronchoscope, or transthoracic aspirations are required if anaerobe studies are needed.

1. Post-Bronchial Sputum Specimens

The first 3 specimens of sputum produced by the patient following bronchoscopy are considered excellent for diagnosing purposes. These are not to be collected together but sent separately to the laboratory immediately after collection. Twenty-four hour specimens will not be received.

1. Gastric Washings for Acid Fast Bacteria

Submission of gastric lavage specimens for the isolation of Mycobacterium tuberculosis is recommended for:

* Those patients with radiological evidence of pulmonary tuberculosis whose sputum is consistently negative.
* Uncooperative patients who are unable/unwilling to produce sputum or who swallow it.
* Those who cannot expectorate because of other medical disorders.
* Those patients who are suspected of submitting sputum other than their own.

These specimens are to be collected early in the morning on a fasting stomach, preferably while the patient is still in bed. The time of collection must be indicated on the slip.

1. Abscesses, Fistulas, Pus, Ulcers, and Wounds

If possible an aspirate should be obtained from the area with a syringe and placed in anaerobic transport media. If this is impossible, a Culturette swab should be used. The entire area of the wound must be swabbed since microbial flora can vary in different parts of the same wound. The Culturette swabs should be delivered to the laboratory as soon as possible. The time of collection must be on the specimen container as well as the specimen site.

1. Feces for Parasitology and Routine Culture

Stool should be collected in a clean container and delivered to the laboratory immediately. Specimens should be collected prior to barium enemas. The time of collection must be on the specimen container. No more than three specimens collected 24 hours apart should be submitted.

1. Fluids, Spinal

All spinal fluids should be collected in sterile tubes and be brought to the laboratory immediately. Time of collection must be marked on the specimen label.

1. Fluids, Other than Spinal

Pleural, synovial, pericardial, ascites and peritoneal fluids should be collected in plain red top vacutainer tubes or sterile screw-cap containers (not swabs) and brought to the laboratory before clotting. Time of collection and specimen site must be on the specimen label(s).

1. Nasopharyngeal

A Universal Viral Transport Medium is preferred for the collection of this type of specimen. Many fastidious micro-organisms can be found in the nasopharynx and are usually not overgrown by normal flora when plated from the original transport medium swab. The time of specimen collection must be written on the specimen label.

1. Urethral and Vaginal or Cervical Discharge

The first portion of a first voided urine specimen should be submitted for N. gonococcus/Chlamydia PCR. A special endocervical swab is available from the laboratory if this specimen collection is preferred.

1. Vaginitis Screening requires use of a collection transport system available from the laboratory. Candida species, Gardnerella vaginalis, and Trichomonas vaginalis are tested by DNA probes. Vaginal swabs are not cultured in this laboratory for this purpose.
2. Throat Culture

Culturette swabs are used for collecting these specimens. The tonsillar area should be swabbed with the 2 swabs and the Culturette swab should be delivered to the laboratory as soon as possible. Dry swabs are not acceptable. The time of collection should be written on the specimen label.

1. Skin and Nail Scrapings

Clean the area with 70% alcohol using a 4" x 4" gauze sponge to remove external contaminants and body oil. With a sterile knife blade, obtain only diseased portions of the nail and only the periphery of a skin lesion since fungi grow out from the center of a lesion. Viable fungi are usually not found on the center. Send the specimen to the laboratory in a sterile screw cap container. Include time of collection on the specimen label.

1. Intravascular (IV) Catheter Tips

Using aseptic technique cut a 2" section of the catheter tip at the distal end. Submit to the laboratory in a sterile, dry, screw top container. NOTE: The length of the portion submitted is VERY important. Longer or shorter segments cannot be properly cultured.

## REPORTABLE DISEASES

1. Individual cases of the following diseases are reported to the Infectious Disease Department of the hospital within 24 hours of identification. The Infectious Disease Department will notify the CDC and Health Department:

* Animal bites
* Anthrax
* Botulism (other than infant)
* Campylobacteriosis
* Cholera
* Diphtheria
* Encephalitis
* Gonococcal infections (all suspected or confirmed antibiotic resistant strains)
* Hepatitis (viral)
* Measles (rubeola)
* Meningitis and other invasive diseases caused by Haemophilus influenzae type B
* Meningitis caused by Neisseria meningitidis
* Meningococcemia
* Pertussis (whooping cough)
* Plague
* Poliomyelitis
* Rabies (human)
* Rubella (including congenital rubella syndrome)
* Salmonellosis
* Shigellosis
* Syphilis (primary, secondary, congenital and other infections suspected to be under one year's duration)
* Trichinosis
* Tuberculosis
* Typhoid Fever
* Yellow Fever
* Yersiniosis
* A suspected epidemic of any disease

1. The following diseases are to be reported individually within seven (7) days of diagnosis:

* AIDS (acquired immune deficiency syndrome)
* Amebiasis
* Ascariasis
* Botulism (infant)
* Brucellosis
* Chancroid
* Chlamydia infections
* Cryptococcosis
* Ehrlichiosis
* Giardiasis
* Gonococcal infections (other than antibiotic-resistant strains)
* Granuloma inguinale
* Herpes simplex infections (genital)
* Histoplasmosis
* HIV Serology (Positive only)
* Hookworm
* Kawasaki's disease
* Kaposi's sarcoma
* Lead poisoning
* Legionnaire's disease
* Leprosy
* Leptospirosis
* Lyme disease
* Lymphogranuloma venereum
* Malaria
* Meningitis (caused by any organism other than N. meningitidis or H. influenzae
* Mumps
* Mycobacterium avium-intracellulare infection
* Pneumocystic carinii pneumonia
* Psittacosis
* Q Fever
* Reye's syndrome
* Rocky Mountain Spotted Fever
* Syphilis (all stages other than primary, secondary, congenital, or other infections suspected to be under one year's duration)
* Tetanus
* Toxic Shock Syndrome
* Toxoplasmosis
* Tuberculin skin tests in children <6 years old (positive only)
* Tularemia
* Typhus

1. The following diseases are to be reported collectively on a weekly basis

* Chickenpox
* Influenza

1. Physicians should also report to the Fayette County Health Department any unusual occurrence of disease, which they feel has public health significance.

## NOTIFICATION OF PROVIDER OF POSITIVE RESULTS

1. The Microbiology Section will notify the primary care provider when any of the following specimens are positive either by culture, smear or PCR. The provider/surrogate accepting the critical value will be asked to repeat back to the caller the patient information and the critical value in order to ensure accurate communication

* AFB Smear/Culture
* Blood culture
* CSF
* Cryptococcal Antigen
* Postive viral cultures/PCR
* Dimorphic Fungus isolates to include:

Histoplasma capsulatum

Blastomyces dermitiditis

Coccidiodes immitis

# SURGICAL AND ANATOMIC PATHOLOGY

LOCATION: B-102

TELEPHONE: EXT. 4530

HOURS OF OPERATION: 7:00 AM TO 4:00 PM Monday through Friday

SECTION DIRECTOR: Roshan Patel, M.D, Ext. 4504

SECTION SUPERVISOR: Kim Manuel, M.T. (ASCP), Ext. 4531

Specimens from each patient, for routine or for frozen examination must be accompanied by one complete, electronically generated, tissue examination request form SF 515 indicating the patient's name, social security number, ward, type of specimen, brief clinical history, and doctor's name and signature. Information on this form must correspond with the identification on the specimen container.

## SURGICAL PATHOLOGY

1. Tissue Specimens
2. All large specimens are to be submitted without fixative, in plastic containers under refrigeration, except when surgery is performed on weekends. In the latter case, 10% formalin fixative is to be used to preserve the specimen until sent to the laboratory.
3. All lymph nodes are to be submitted fresh to the laboratory except on weekends and nights when 10% formalin is to be used to preserve the specimen until the next regular work day. If submitted fresh, a pathologist is to be contacted immediately by the Histology Section.
4. All muscle and nerve biopsies, except vagus nerves, are to be submitted in formalin fixative stretched taut by use of Kelly clamps. If clamps are not available, biopsies may be stretched on applicator sticks and sutured taut to the stick.
5. All tissue suspected of highly infective microbiologic contamination, submitted to laboratory service for further studies, should be appropriately containerized and labeled in order to reduce the risk to laboratory personnel.
6. If the physician feels that the tissue specimen should require any type of special treatment, for example, special staining, then he should consult the histotechnician or the pathologist for the proper procedure for submitting the specimen to the laboratory.
7. All other tissue specimens should be submitted in an appropriate specimen container, (bottle or plastic bag) containing 10% formalin. The volume of the formalin must be at least 15-20 times the volume of the specimen and the screw-top lid must be securely fastened. The patient's name, social security number, ward number, type of specimen, and the doctor's name must be attached securely to the container.
8. Frozen Sections

It is recommended that the pathologist be notified at least 30 minutes prior to receiving tissue for frozen section examination. If possible, a day's notice is desired to avoid unnecessary delay.

1. Delivery of Specimens
2. Operating Room Specimens
3. All Tissue specimens in formalin which originate from the OR may be placed through the Surgery window on the counter in the Frozen Section room (A606) each day until 2:30 PM. Surgery must print a Tissue Exam Form, which must match the information on the specimen jar. The laboratory will pick up specimens from 7:30 AM – 2:10 PM. Specimens to be delivered after 2:10 PM must be placed in the refrigerator in A606 and will not be collected by the lab until the next day. NOTE: All fresh specimens must be put in the refrigerator, no exceptions.
4. All extremities must be placed in the refrigerator in A606 and the request forms may be placed on the counter. The specimen must be documented on the OR specimen receipt log. The OR should notify the laboratory when a specimen is placed in the A606 refrigerator. This includes both weekdays and weekends.
5. Ward, Clinic and Emergency Room Specimens

Specimens from the wards, clinics and the ER are to be delivered directly to the blue cart in the Chemistry area in the back of the lab, B-102. If next day results are needed on weekdays, the specimen must be in the laboratory by 2:10 PM. After hours and weekend work must be cleared through a pathologist. On evenings, the weekends and holidays, the specimens are to be delivered to the laboratory, B-102.

1. Procedure for handling a bullet, piece of metal or other materials from a patient with medico-legal implications

Purpose: To maintain a legal, binding, chain of evidence in case of Medico-Legal actions

1. When a specimen of the above mentioned nature is submitted to the laboratory, it must be accompanied by a form entitled “Record of Possession of Medico-Legal Specimens” This form must contain the following information:
2. Patient’s name, hospital number, and unit.
3. Doctor’s name and signature. If physician removes object, ideally he/she should deliver specimen to the laboratory and fill out the form.
4. Source of the specimen.
5. Date and time specimen is submitted.
6. Brief clinical history
7. Pre-operative diagnosis.
8. Specimen will be delivered directly to the Histology Laboratory by OR, ER or Unit personnel. Upon delivery of the specimen, this form may be filled out. Form is located on mid-bench #30 in a black binder. The person delivering the specimen to the Laboratory will fill out all the pertinent information. Ideally, this should be the physician, nurse, or tech that removed the object from the patient. The number of people touching the specimen should be held to a minimum. Everyone touching the specimen or the container that the specimen is in must sign the chain of evidence. Sign, time, and date form over to appropriate Laboratory personnel.
9. In instances where the specimen is delivered to the laboratory during “non-regular” working hours, a locked holding area, labeled **Medico-Legal**, is provided in the laboratory on bench #15, cabinet 15-129, to store the specimen until “regular” working hours. The key, labeled medico-legal, is located in the Chemistry department desk.

Please place the specimen in the holding area cabinet and lock. Remember, you are responsible for this specimen until you sign it over to someone on the next coming shift. Evening shift personnel will sign it over to mid-night shift personnel, and mid-night shift personnel will sign it over to Histology personnel.

1. Histology personnel will sign, time, and date the form and will deliver the specimen and the form to the Surgical Pathology resident who will perform the gross dictation on the specimen.
2. The Surgical Pathology resident will sign, time, and date the standard form “Record of Possession of Medico-Legal Specimens” after completing the gross dictation. At this point, the Surgical Pathology resident will sign the specimen and form back over to Histology personnel who will deliver it back to the lock box on Bench #15. Specimen and Form will stay there until the specimen is signed out and authorized personnel come to pick it up.
3. After authorized medical personnel pick up the specimen and sign, time, and date the form, Histology personnel will copy the form and give the original to whomever picks up the specimen. The copy will be filed along with patient’s Pathology report.

## REPORTING RESULTS – SURGICAL PATHOLOGY

1. First Malignancy Diagnoses
2. All first malignant diagnoses (excluding squamous and basal cell carcinomas) confirmed by two pathologists, will be verbally communicated to a responsible licensed independent practitioner within one working day of the time the diagnosis is made.

1. Notification will be documented in the Anatomic Pathology Report which will include the full name of the responsible LIP accepting the results, date/time contacted, and a remark that the results were “read back”.
2. Routine Specimens

Pathology evaluation reports of all routine specimens submitted will be available and delivered to the appropriate ward within two working days. If next day results (24 hours) are needed, the specimen must be in laboratory by 2:15 p.m. Specimens requiring special diagnostic procedures may require a long time.

1. Frozen Sections
2. The pathologist will date/time stamp the patient Frozen Section Tissue Examination Form to mark the time of specimen receipt. The pathologist follows by recording the diagnosis on the Tissue Examination Form and posting an additional date/time stamp that registers the time the Frozen Section’s intra-operative diagnosis was determined. The pathologist will also initial the Tissue Examination Form.
3. The pathologist will immediately call Frozen Section results to the Operating Room (OR) and responsible LIP (surgeon) via the intercom system or the result may be directly communicated to the LIP (surgeon). The pathologist will verify the appropriate OR suite number and identify the patient by full name and full social security number. The patient identifiers will be confirmed and repeated back by the Operating Room/LIP (surgeon) before the pathologist verbally communicates the diagnosis report. The pathologist will communicate the Frozen Section Intra-operative Diagnosis to the LIP (surgeon) and the LIP must repeat the diagnosis back to the pathologist. The pathologist will record the following information in the designated spaces of the Frozen Section Diagnosis **Notification** Form:

* OR Suite No.
* A statement that the report was “read back”
* Name of the LIP (surgeon) that received the report
* The date and time the diagnosis was communicated

Pathologist name

1. The Frozen Section Intra-operative Diagnosis and all date/time stamps will be documented on the Tissue Examination Form. The “Notification” form will be attached to the Tissue Examination Form. The information on both the Tissue Examination Form and the associated “Notification” form will be dictated during the (formal) gross examination of the specimen, and included in the final Anatomic Pathology report.
2. The expected turnaround time for intraoperative consultation, as mandated by the CAP, is 20 minutes or less. (The time interval covering order receipt to order completion.) Longer turnaround times may be expected in cases with multiple sequential frozen sections on a single specimen, or in cases where additional studies such as radiographic correlation are required. Results of the frozen section are communicated by the pathologist, to the surgeon, within the 20 minute “order start to order completion” time interval unless otherwise specified.
3. Privacy Act
4. Due to the Privacy Act, no reports or specimens will be released outside of the VA-UK complex without the approval of the Pathology and Laboratory Medicine Service.

## IMMEDIATE DISPOSITION OF A BODY FOLLOWING DEATH

1. It shall be the policy of this medical center to preserve with dignity the bodies of deceased until they are released to the funeral home representative. The following procedures are to be followed when the death of a patient occurs.

* Leestown Division: During regular duty hours, nursing personnel keeps the body of deceased on the unit for a period of up to two hours. For periods in excess of two hours, or when an autopsy is to be performed, nursing personnel will transport the body to the morgue. The Means Test Clerk (LD) will be responsible for unlocking the morgue for nursing personnel. During irregular tours of duty, Police and Security will unlock the morgue. The Details Clerk (CDD) on regular tour of duty or the AOD on irregular tours will be responsible for executing the “Receipt of Body at Morgue” portion of the SF 523 A. The Details Clerk, regular duty hours, or the AOD, off tours, coordinates the pickup of the remains with Pathology and Laboratory Medicine Service (CDD) in the event there is to be an autopsy on an inpatient.
* Cooper Drive Division: During regular duty hours, the Details Clerk will be notified before the body is delivered to the morgue. Nursing personnel will be responsible for transporting the body to the morgue. The Details clerk will execute the “Receipt of Body at Morgue” portion of the SF 523 A. During other than regular duty hours, the AOD will perform this duty and forward form SF 523 A to Police and Security Service who will deliver it to the appropriate nursing unit.

1. Body of the deceased must be properly identified with both wrist and identification (bracelet) and toe tag.
2. Do not bring personal effects to the morgue. The Laboratory will not be responsible for them. Nursing personnel on the unit will give the patient’s personal effects to an Environmental Management Service representative (The Clothing Storekeeper at the Leestown Division and the secretary at the Cooper Drive Division) for safekeeping until they are released to the next-of-kin. During other than regular duty hours, the Administrative Officer of the Day (AOD) will accept the personal effects and will turn them over to the Environmental Management Service representative the following workday.
3. Once the body has been delivered to the morgue, Health Administration personnel will be responsible for releasing the body to the funeral home. Under no circumstances will laboratory personnel release a body to the funeral home.

## POST MORTEM EXAMINATION

1. When an autopsy is to be performed, a VA Form 523 is to be properly completed and signed by the next of kin legally responsible to give consent. In the absence of a written authorization, a telegram from the deceased's nearest kin must be attached to VA Form 523. If written or telegram consent cannot be obtained, the legal next of kin may grant consent via telephone. The attending physician should contact the Details Office, x-4947, or the Administrative Officer of the Day (AOD) x- 4358 to assist in contacting the legal next of kin and arranging telephonic consent. In addition, the circumstances, which preclude written consent, must be documented in the medical record and the entry must be signed by the attending physician. If permission is granted via the telephone, the conversation must be recorded and witnessed by two people. The Witness, (Detail's Clerk or AOD) must sign the autopsy authorization permit. The recorded consent must be retained in a locked receptacle for later review.
2. The original autopsy authorization is to accompany the medical record to the University of Kentucky Medical Center for the autopsy.
3. The Details Clerk, during administrative hours, and the Administrative Officer of the Day (AOD) during non-administrative hours is responsible for notifying the Pathology resident on call and the UK Hospital Admitting Office of an autopsy, regardless of the time of day or night.
4. The UK Hospital Admitting Office will contact the UK Autopsy Technician and inform them that the autopsy is to be performed. During regular duty hours, when an autopsy is to be performed, the UK Autopsy Technician will call the Details Clerk (Health Administration) and request access to the VA morgue. The University of Kentucky Autopsy Technician will secure the patient’s chart from the Details Clerk and proceed to the cold storage room, B-6, to secure the body. The Details clerk will unlock the morgue for the UK Autopsy Technician and release the remains to that person. When the autopsy is to be performed during other than regular duty hours, the UK Autopsy Technician will call the AOD and request access to the VA morgue. the AOD will unlock the morgue, provide the patient’s chart for the UK Autopsy Technician and release the remains. If the Details Clerk or the AOD is not available to allow access to the morgue, the UK Autopsy Technician will call Police and Security to unlock the morgue, obtain the patient chart, and release the remains.
5. After completion of the autopsy, the UK Autopsy Technician will return the remains to the VA cold storage room, B-6, and bring any cultures and other specimens to the VA laboratory. When the UK Autopsy Technician returns the body to the VA morgue, the same procedure as above should be followed. VA staff should open the morgue and officially accept the body back to the VA. In some instances, the funeral home will pick up the body directly from the UK morgue. At these times, VA staff should be present to officially release the body to the funeral home.
6. The resident will be responsible for returning the patient’s chart to the Autopsy Office Automation Assistance along with the Provisional Anatomic Diagnosis within 72 hours.
7. Reporting of Diagnosis
8. A Provisional Anatomic Diagnosis (PAD) should be recorded in the medical record within 2 working days and the complete protocol should be made part of the medical record within 30 working days.
9. Due to the Privacy Act, the resident must check with Release of Information before releasing any reports or specimens outside the VA-UK complex.

# CYTOLOGY

LOCATION: B-102

TELEPHONE: Ext. 4519

HOURS OF OPERATION: 8 AM to 4:30 PM, Monday through Friday

PATHOLOGIST: Roshan Patel, M.D, Ext. 4504

CYTOTECHNOLOGIST: Allen Boatwright, B.S., CT (ASCP), Ext. 4519

## AVAILABLE PROCEDURES IN CYTOLOGY

1. Cytologic examination for malignancy is performed on the following specimens:

* Aspiration biopsy smears
* Bladder Washings
* Breast secretions
* Bronchial washings and brushings
* Colonic washings and brushings
* Duodenal aspirate
* Esophageal washings and brushings
* Gastric washings and brushings
* Gynecologic cytologic material
* Imprint smears or "touch" preparations
* Oral Smears
* Pleural, peritoneal and pericardial fluids
* Spinal fluid
* Sputum
* Synovial fluid
* Tracheal aspirate
* Urine

1. Other procedures available are:

* Identification of Pneumocystis carinii and other fungal organisms.
* Various special stains
* Flow cytometric procedures
* Tzanck Smear
* High Risk HPV DNA Testing (available as a Send-out to LabCorp)

## INSTRUCTIONS FOR COLLECTION AND SUBMISSION OF CYTOLOGIC SPECIMENS

1. General Instructions
2. Each specimen submitted for cytology must be accompanied by a completed, electronically generated, tissue examination form, SF-515, indicating the patient's name, social security number, ward, date, type of specimen, pertinent clinical history, including prior treatment and prior cytology or histology results. The tissue examination request can only be generated by physicians or other clinicians authorized by Pathology and Laboratory Medicine Service Automated Information Security guidelines. (Access to the menu option is controlled by the Laboratory Information Manager and alternates.)
3. All specimens for cytology should be submitted in sterile specimen containers. These containers are obtained on the ward or from SPD.
4. All specimen containers should be properly labeled with the patient's name, social security number, ward, date, and type of specimen.
5. The special advantage of the Papanicolaou stain is the wet fixation method by which the transparency of the cell structure is maintained so that we can recognize fine changes in a single cell. In order to accomplish this purpose, smears should be immersed in 95% ethyl alcohol immediately.
6. Bottles containing 95% ethyl alcohol are obtained from the cytology section - Room B102, bench 23.
7. If in doubt as to method for submission of specimens, please contact the cytology section, extension 4519.
8. All specimens submitted for cytology after 2:30 PM during the week and on holidays are refrigerated and processed the following day. If submitted during the weekend, specimens are processed the following Monday.
9. The following specimens are not acceptable in Cytology:
10. A specimen whose container label does not match corresponding patient identification on tissue examination form, SF 515.
11. Any unfixed specimen after hours during the week and on weekends that is not refrigerated prior to processing.
12. Slides, e.g. brushings and pap smears that are labeled with incorrect patient identification according to corresponding tissue examination form, SF 515.
13. Slides, irreparably broken upon receipt.
14. Specimen containing material not representative of the given site.
15. Specimens submitted with obscuring food particles (e.g. sputa) or feces (e.g. urine) without history to explain the finding.
16. Routine afternoon sputa from inpatients (see 15d).
17. Acellular specimens.
18. For any specimen received in cytology that is considered unsatisfactory or unacceptable, the following corrective action will be initiated:
19. An accession number is assigned to the specimen along with explanation of why the specimen is unsatisfactory.
20. A physician is notified by phone that cytology did receive the unsatisfactory specimen.
21. A final report is sent to the patient's chart and a copy of this report is filed within the cytology section. The report will contain the following information -- why the specimen is unacceptable for cytology processing and the time and date when a physician was notified.
22. Occasionally, specimens that appear to be unacceptable may upon consultation with physician, be usable. See procedure on criteria of specimens unacceptable for interpretation.
23. Specific Instructions
24. Aspiration Biopsy Smears
25. A pathologist is available to perform or provide assistance other clinicians in obtaining fine needle aspirations (FNA) of palpable lesions. To arrange for a FNA, call extension 4519.
26. To prepare smears, one drop of the aspirated material is placed on one end of the slide. Place a second slide or coverslip over the material and spread evenly. Apply gentle pressure and place all slides immediately into 95% ethyl alcohol. Some slides may be air dried as needed.
27. If inexperienced in smear preparation, contact Pathology
28. Aspiration biopsies that occur with radiographic guidance must be scheduled with the cytology division between the hours of 8 am and 2:30 pm. This is done by calling extension 4519. At the time of the procedure, the cytotechnologist and pathologist go to the radiology department. When the sample is obtained, the cytotechnologist or pathologist makes the slides as described in Step 2. The slides are immediately stained by either the rapid Papanicolaou stain or Diff-Quik, depending on the pathologist's preference. Once the immediate slides have been prepared and a preliminary diagnosis given, the remaining specimen is processed for direct smears, cytospins or cell block depending on the quantity of material available. The Cytology Section does not routinely provide assistance for Radiology aspirates after 3 pm.
29. Bladder Washings

When cystoscopy is performed, washings with normal saline or Ringer's solution are collected and sent immediately to the laboratory for cytospin preparation.

1. Breast Secretions
2. Smears should be submitted on frosted-end slides labeled with the patient's name and social security number.
3. The material from a nipple discharge is spread thinly on a clear glass slide and promptly fixed in a bottle of 95% ethyl alcohol.
4. Needle cyst aspirations should be fresh and sent immediately to the laboratory for processing.
5. Bronchial Washings
6. Washings should be submitted fresh immediately to the laboratory in sterile specimen containers.
7. Please indicate the area of the lung from which the washings are obtained.
8. For identification of Pneumocystis carinii, or other pathogenic fungi, submit the specimen as outlined above. In addition, suspected organism must be indicated on the tissue examination form, SF-515, as the detection and identification of some of these organisms require special stains.
9. Brushings
10. Bronchial, esophageal, gastric brushings, or brushings from other sources should be submitted on frosted-end slides marked with the patient's name and social security number.
11. Paper clips should be attached to the end of the slides to prevent the slides from touching each other.
12. Prepare the smears immediately by gently rotating the brush along the surface of the slide. Place all slides immediately in a bottle of 95% ethyl alcohol.
13. Immediately after obtaining the smears, the catheter tip and the brush should be shaken into 5 cc. of normal saline. Submit all specimens for cytologic examination.
14. For identification of Pneumocystis carinii, or other pathogenic fungi submit the specimen as outlined above. In addition, suspect organism must be indicated on the tissue examination form, SF-515, as the detection and identification of some of these organisms require special stains.
15. Colonic Brushings and Washings
16. Colonic brushings, obtained during fiberoptic colonoscopy or proctoscopy, are handled as indicated under brushings.
17. Colonic washings should be submitted fresh immediately after collection to the laboratory
18. If in doubt as to procedure, please contact the cytology section, extension 4519.
19. Duodenal Aspirate
20. Prepare patient as per gastric washing
21. Collect the duodenal aspirate in sterile specimen containers placed in an ice bath.
22. Submit the specimen fresh immediately after collection.
23. Esophageal Washings
24. Place the patient NPO at midnight. Usually an overnight fast is sufficient preparation before obtaining the washings.
25. Washings should be submitted fresh immediately after collection to the laboratory in sterile specimen containers.
26. Gastric Washings
27. Place the patient NPO at midnight. Usually an overnight fast is sufficient preparation before obtaining the gastric washing.
28. When using physiologic saline or Ringer's solution an equal volume of 95% ethyl alcohol should be added. If chymotrypsin is used, place specimen on ice.
29. Submit the gastric washings to the laboratory for processing.
30. Gynecologic Cytologic Material
31. The patient should not douche nor use contraceptives for 24-48 hours prior to obtaining the smear. In addition, a smear should not be taken during menstrual bleeding or within 24 hours of intercourse.
32. All smears should be submitted on frosted-end slides marked with the patient's name and social security number. In addition to clinical information required under general instructions, please include on the tissue examination form, SF-515, date of last menstrual period, contraceptive and obstetrical history.
33. Vaginal pool smears are obtained by aspiration of the posterior fornix of the vagina with a pipette. The secretions are spread thinly on a clean glass slide and fixed immediately in a bottle of 95% alcohol.
34. For hormone evaluation, a separate vaginal smear is obtained by scraping the lateral vaginal wall. Immediate fixation in 95% alcohol is required. Hormonic evaluation must be specifically requested.
35. Cervical smears are obtained from the area of the portio vaginalis around the external OS by means of an endocervical brush and cervical-scraper by inserting the scraper tip into the OS and rotating it 360o. Spread the material thinly on a clean glass slide and fix immediately in 95% alcohol. Endocervical sampling is done by inserting a brush into the OS, leaving terminal bristles visible, rotating it 180o and rolling it over the slide. Cotton swabs should not be used.
36. Endometrial aspiration specimens can be obtained by a variety of instruments. This procedure in conjunction with a vaginal pool smear should be considered for women older than 40 and for those women with menstrual abnormalities. Contact the laboratory for information. Consultation with Gynecology is recommended.
37. For the identification of Herpes simplex or other organisms, submit the specimen as described above.
38. Imprint Smears or "Touch" Preparations
39. Smears are made by pressing the fresh cut surface of a lesion (e.g. skin ulcer) onto a clear glass slide.
40. Slides must be labeled with the patient's name and social security number
41. Immediate fixation in 95% ethyl alcohol is required.
42. History should include the type of lesion (e.g. viral inclusions) sought.
43. Oral Smears
44. Smears should be submitted on frosted-end slides labeled with the patient's name and social security number.
45. The surface of the lesion is scraped vigorously with a tongue depressor and spread rapidly on a clean glass slide.
46. Slides are placed immediately in a bottle containing 95% ethyl alcohol.
47. Tzanck Smear
    * 1. **Indications:** Detection and characterization of inflammatory/infectious processes of the skin, especially herpetic infections (Tzanck Smear).
      2. **Specimen Required:** Direct smear of material collected from a skin lesion, usually a vesicle.
      3. **Collection Procedure:** Label two slides with the patient's name and social security number in pencil on the frosted end of the slides. Gently scrape the area of abnormality with a skin scraping spatula, or a scalpel blade. If the abnormality is a vesicle, remove the covering and scrape both at the base of the vesicle and around the rim. Quickly and evenly smear the collected material on one of the glass slides. Immediately immerse the slide in a container filled with 95% ethyl alcohol. If the 95% ethyl alcohol is unavailable, the slide may be spray fixed in a fashion similar to Cervical Pap smears. Repeat the process with the second slide, if necessary, for better diagnosis yield. Submit the specimen and a completed tissue examination form (SF-515) to the Cytology Laboratory.
48. Pleural, Peritoneal, and Pericardial Fluids
    * + 1. During collection of the specimen, an anticoagulant (heparin) must be added to prevent fibrin formation.
        2. It is of the utmost importance that the specimen be submitted unfixed immediately to the laboratory in sterile specimen containers.
        3. 100-200 cc. of fluid, if obtainable, is sufficient volume for cytologic examination. If an aliquot is submitted, make sure the specimen is well mixed before obtaining it.
        4. When specimens of 50 cc. of fluid or more are submitted, heparin must be added in the approximately proportion of 5 to 10 units of heparin per ml. of fluid. Heparin is available from the pharmacy -- 1000 USP units/ml in 10 ml vials.
        5. If only a lesser volume of fluid (25 cc. or less) can be obtained, please submit the specimen in heparinized tubes (Green/Red top vacutainer tubes).

1. Spinal Fluid
   * + 1. Submit the specimen fresh in a clean test tube immediately after collection. When several samples are obtained, the second or third should be used for cytology.
       2. If other tests are to be performed, please divide the specimen before sending to the laboratory.
2. Sputum
3. Specimens should be collected on three consecutive mornings with each specimen being sent immediately to the laboratory in a sterile specimen container.
4. The sputum specimen must be collected immediately after the patient arises and prior to the patient's intake of any food.
5. The patient must rinse his mouth out with water before producing the specimen and must be instructed to produce a deep cough specimen, as a specimen consisting of saliva is of no diagnostic value.
6. The cytology section will accept sputum specimens as follows:

* Only early morning sputum specimens from the wards will be accepted.
* The only specimens that will be accepted in the afternoon are post-bronchoscopy sputum specimens and specimens on patients from the emergency room and outpatients.
* The cytology section will not accept sputum specimens collected over a 24-hour period or the second sputum specimen on the same day.

1. For identification of Pneumocystic carinii, Herpes Simplex, or other pathogenic fungi, submit the specimen as outlined as above. In addition, the suspected organism must be indicated on the tissue examination form, SF-515, as the identification of some of these organisms requires different special stains.
2. Synovial Fluid

Submit fresh immediately after collection.

1. Tracheal Aspirate

Submit fresh immediately after collection.

1. Urine
   * + 1. Urine specimens must be submitted fresh immediately following collection. If there is any delay in submitting the urine to the cytology laboratory, an equal volume of fixative (50% ethyl alcohol) must be added.
       2. Catheterized urine is recommended for all female patients to prevent contamination from vaginal secretions.
       3. Catheterized urine or "clean catch" specimens are preferred from male patients, but the usually voided urine is acceptable.
       4. 50-100 cc. is a sufficient volume for cytologic examination
       5. When a lesion of the renal pelvis or ureter is suspected, ureteral catheterized specimens are desirable. Please label specimen as to whether voided or catheterized and urethral specimens must be labeled left or right.
       6. If there is a delay in submitting any of the above specimen to the laboratory, collect in an equal volume of fixative - 50% ethyl alcohol. This fixative can be obtained from the cytology laboratory, extension 4519.
       7. Due to rapid cellular degeneration of urine specimens, it is advisable not to collect specimens after 4:30 PM during the week and not to collect specimens on the weekend.
       8. For identification of cytomegalic inclusion bodies, submit specimens as above.

## INSTRUCTIONS FOR COLLECTION AND SUBMISSION OF CYTOLOGIC SPECIMENS FOR THINPREP

1. General Instructions
2. Each specimen submitted for cytology must be accompanied by a completed tissue examination form (SF-515) indicating the patients name, social security number, ward, date collected, type of specimen, pertinent clinical history, including prior treatment and prior cytology or histology results, and requesting providers name. It is policy that specimens are accepted only from physicians or other staff professional authorized by law and by hospital privileges to do so.
3. Most specimens for cytology should be submitted fresh, in sterile specimen containers. These containers are obtained on the ward or from SPD. The only exceptions are Gynecologic (Cervical/vaginal) material submitted for the ThinPrep Pap test and brushing specimens, ie… Bronchial or Esophageal. Brushing specimens other than superficial brushing/scraping will be collected and then rinsed directly into CytoLyt solution vials. The brush tip should also be cut off and put into the Cytolyt vial. Superficial scrapings or brushings such as Tzanck smears will be collected and rinsed directly into PreservCyt solution vials. Cervical/Vaginal material will be collected and rinsed in PreservCyt solution vials. CytoLyt and PreservCyt solution vials can be obtained from the Cytology section of the Laboratory.
4. All specimen containers should be properly labeled with the patients name, social security number, ward, date collected, and type of specimen.
5. If in doubt as to method for submission of specimens, please contact the Cytology section at extension 4519.
6. All specimens submitted for Cytology after 2:30 PM during the week or anytime on weekends or holidays are refrigerated and processed the following working day. If submitted during the weekend, specimens are processed the following Monday.
7. For specimens unacceptable in Cytology, refer to guidelines outlined in “Instructions for Collection and Submission of Cytologic Specimens”.
8. Specific Instructions
9. Brushings
10. Bronchial, esophageal, gastric brushings, or brushings from other sources should be submitted in CytoLyt solution vials labeled with patients name and social security number.
11. Superficial brushings or scrapings such as Tzanck smears and oral smear/scrapings should be submitted in PreservCyt solution vials labeled with patients name and social security number.
12. Prepare the specimens by swirling the brushings in a pre-filled container of PreservCyt/CytoLyt. Swirl the brush vigorously to dislodge any cellular material from the brush bristles. For optimal cell harvest, cut the brush tip off and place into the PreservCyt/CytoLyt vial-containing specimen.
13. Send labeled specimen to laboratory along with completed tissue exam form (SF-515).
14. Gynecologic (Cervical/Vaginal) specimens
15. The patient should not douche, use vaginal medication, or have intercourse 24-48 hours prior to obtaining the specimen.
16. All specimens should be submitted in ThinPrep gynecologic PreservCyt vials marked with patient name and social security number. In addition to clinical information required under general instructions, please include on the tissue examination form (SF-515), date of last menstrual period, contraceptive and obstetrical history.
17. For hormonal evaluation, the vaginal specimen is obtained by scraping the lateral vaginal wall. Rinse collection device (as described below in cervical/vaginal specimen collection) into a ThinPrep gynecologic PreservCyt vial.
18. To collect Cervical/Vaginal specimens for the ThinPrep Pap test: With patient in lithotomy position, expose cervix using a vaginal speculum moistened with warm water. Visually examine vaginal mucosa and cervix for lesions, ulcerations or discharge. Document findings of the examination on patient’s record, and communicate the relevant clinical findings to laboratory for optimum cytological interpretation.

* To collect specimen from the exocervix, select contoured end of plastic spatula and rotate it 360 degrees around the entire exocervix while maintaining tight contact with exocervical surface. Remove spatula.
* Rinse contoured end of plastic spatula in a vial of PreservCyt Solution by swirling vigorously **ten** (10) times. Discard plastic spatula. Place cap on vial until step (d).
* Insert Cytobrush Plus GT device into the endocervix until only the bottom-most bristles are exposed. Slowly rotate ¼ to ½ turn in one direction. Remove device. Do not over-rotate. Additional rotating may cause bleeding and contaminate specimen.
* Rinse the Cytobrush Plus GT device in the PreservCyt solution by rotating the device in the solution **ten** (10) times while pushing it against the wall of the vial. Swirl the device vigorously to further release material. Discard device.
* Tighten the PreservCyt vial cap so that the torque line on the cap passes the torque line on the vial.

1. Send labeled specimen to laboratory, along with completed tissue examination form (SF-515).

## CYTOLOGY REPORTING SYSTEM

Verbal communication (phone call or face to face) of all first malignant diagnoses (excluding basal cell carcinomas of the skin) for Surgical Pathology and Cytopathology will be made to the requesting physician by the house staff or attending physician at the time of sign out. This will be recorded in a record book retained by the Anatomic Service in the sign out area. The record will include the name of the physician notified and the notifying physician, the time, date, and means by which notification was given. The physician notified will record and read back the notification message, including the patient’s name last four, and the diagnosis. Record of the notification will also be noted on the patient’s pathology report.

1. Cytology results are reported in the following manner:
2. Non-GYN
3. Unsatisfactory specimen. An explanation is given why the specimen is unsatisfactory
4. Non-diagnostic. Indicates that cellular material may be present but does not explain the lesion.
5. No evidence of malignancy. Inflammatory response and organisms when present.
6. Atypical cells present. A repeat may be requested.
7. Suspicious for malignant cells
8. Positive for malignancy. Whenever possible, a classification of the tumor will be reported.
9. GYN Specimens (categorized according to the Bethesda System 2001)
10. Negative for Intraepithelial Lesion or Malignancy
11. Inflammatory/reactive. Infections organisms, where identified, are listed. Repeat may be recommended.
12. ASC-US/ASC-H/AGCUS (Atypical squamous cells of undetermined significance/cannot exclude HSIL/atypical gland cells of undetermined significance). AGCUS is specified by type, endocervical, endometrial, or extrauterine wherever possible, and will be categorized NOS or favor neoplastic.
13. Dysplasia. Is characterized as low-grade or high-grade wherever possible. Repeat, follow-up or further work-up may be recommended.
14. Endocervical adenocarcinoma in situ
15. Suspicious for malignancy. Type is specified if possible. Follow-up and/or work-up are recommended.
16. Positive for malignancy. Type is specified if possible. Follow-up and/or work-up are recommended.
17. Specimen adequacy:
18. Satisfactory for evaluation (presence or absence of endocervical/transformation zone component and any other quality indicators, e.g., partially obscuring blood, inflammation, etc. will be noted.
19. Unsatisfactory for evaluation (reason will be specified)

* -Specimen rejected/not processed (reason specified)
* -Specimen processed and examined but unsatisfactory for evaluation of epithelial abnormality because of (specify reason). A repeat may be requested.

1. Cytology reports are available according to the following schedule:
2. Specimens received in the laboratory before 2:30 PM Monday through Friday are processed the same day with the results usually available the following day.
3. Specimens received in the laboratory after 2:30 PM Monday through Friday, are processed the next day with the results usually available the following day.
4. Specimens received during the weekend are processed on Monday. The results are usually available on Tuesday.
5. If further study is needed by the pathologist or special stains are requested, there will be a slight delay in reporting the results.

# THE VA REFERENCE LABORATORY FOR SELECTED SEROLOGIC STUDIES

LOCATION: Cooper Drive Division, Room A-139

TELEPHONE: 4838

SECTION DIRECTOR: Laura M. Crump, M.D. Ext. 5939

SECTION SUPERVISOR: Rebecca Haynes, MT, (ASCP), Ext. 4839

This laboratory is the only serologic reference facility in the VA system and serves all of the VA hospitals in the United States. Tests are performed for serodiagnosis of infectious diseases. It is under the direction of Laura Crump, MD. and is located in Room A-139 Cooper Drive Division, telephone extension 4838. Requests for tests performed in this laboratory should be directed to the clinical lab in the usual manner. Please use electronic order to request testing.

The services of this laboratory are available to this medical center. Specimens may be submitted through the Leestown or Cooper Drive labs.

## AVAILABLE TESTING

1. Auto-immune**\*** (ordered separately):

|  |  |  |
| --- | --- | --- |
| **Auto-immune Test** | **Method** | **Specimen** |
| Anti-DNA (DNA) | IFA | Red/grey top tube |
| Anti-Mitochondrial Antibody (AMA) | IFA | Red/grey top tube |
| **\***Anti-Nuclear Antibody (ANA) | IFA | Red/grey top tube |
| Anti-Smooth Muscle Antibody (SMA) | IFA | Red/grey top tube |
| Anti-Parietal Cell Antibody (PCA) | IFA | Red/grey top tube |
| Anti-Liver-Kidney Microsomal Antibody (LKM) | IFA | Red/grey top tube |

**\***If ANA is positive at a titer 1:160 with a homogeneous and/or peripheral pattern, an anti-DNA will automatically be done.

1. Cytomegalovirus (CMV) IgG, IgM panel

Method: CLIA

Specimen: Red/grey top tube

1. Epstein-Barr Virus Panel

Method: CLIA

Specimen: Red/grey top tube

Panel consists of tests for:

* EBV capsid antigen antibody (EBV VCA) IgG
* EBV capsid antigen antibody (EBV VCA) IgM
* EBV early antigen antibody (EBV EA) IgG
* EBV nuclear antigen antibody (EB NA)

1. Enterovirus

Method: PCR

Specimen: CSF, Stool

* Enterovirus PCR (Polioviruses, Coxsackie viruses, Echoviruses, and Enteroviruses in CSF)

1. Farmers Lung panel

Method: ID

Specimen: Red/grey top tube

Each panel consists of tests for antibody against:

* *Aspergillus fumigatus* type 1
* *Aspergillus fumigatus* type 6
* *Aureobasidium pullulans*
* *Micropolyspora faeni*
* Pigeon serum
* *Thermoactinomyces candidus*
* *Thermoactinomyces viridis*
* *Thermoactinomyces vulgaris*

1. Fungus panel

(ID by request or if indicated)

Method: CF

Specimen: Red/grey top tube

* *Aspergillus spp*
* *Blastomyces dermatitidis*
* *Coccidiodes immitis*
* *Histoplasma capsulatum* mycelial
* *Histoplasma capsulatum* yeast

1. Helicobacter pylori IgG

Method: EIA

Specimen: Red/grey top tube

1. Hepatitis (Order separately or \*immune or acute panel)

Method: EIA

Specimen: Red/grey top tube

* A IgM antibody (HAV-IgM)
* B surface antigen (HBsAg
* B core IgM antibody (HBc-IgM)
* B core Total Antibody (HBc-Tot)
* B surface antibody (HBs antibody)
* Hepatitis C virus (HCV)
* \*immune panel = HBsAg, HBs Antibody
* Acute panel = HBsAg, HBc-IgM, HAV-IgM, HCV

1. Hepatitis C quantitative RNA

Method: PCR

Specimen: Red/grey top tube

1. Hepatitis C Genotype

Method: PCR

Specimen: Red/Grey top tube

1. Herpes simplex virus panel, IgG

Glycoprotein G1, Glycoprotein G2 specific assay

(HSV 1 & HSV2 - both tests automatically done)

Method: CLIA

Specimen: Red/Grey top tube

1. HIV-1

HIV-1/2 plus O antibody screen in combination with HIV-1 p24 Antigen

Method: EIA

Specimen: Red/Grey top tube

HIV-1 confirmation

(Performed on all EIA-reactive specimens)

Method: WB

Specimen: Red/Grey top tube

1. Lyme Disease screen, IgG & IgM Combo

Method: CLIA

Specimen: Red/Grey top tube

Line Blot Supplemental

Method: LB Differential for IgG and IgM

Specimen: Red/Grey top tube

(Performed on all positive or equivocal screens)

1. Measles IgG

Method: CLIA

Specimen: Red/Grey top tube

1. Mumps IgG

Method: CLIA

Specimen: Red/Grey top tube

1. Mycoplasma IgG & IgM done as Panel

Method: Quantitative EIA

Specimen: Red/Grey top tube

1. Rubella IgG (Immune Status)

Method: CLIA

Specimen: Red/Grey top tube

1. Syphilis-Confirmatory only

Method: MPA-TP

Specimen: Red/Grey top tube

1. Toxoplasma IgG, IgM Panel

Method: CLIA

Specimen: Red/Grey top tube

1. Varicella zoster IgG (Immune status)

Method: EIA

Specimen: Red/Grey top tube

1. Vitamin D (25 hydroxy Vitamin D Total)

Method: CLIA

Specimen: Red/Grey top tube

**Method Codes**

* CF = Complement Fixation
* CLIA= Chemiluminescent Immunoassay
* EIA = Enzyme Immunoassay
* ID = Immunodiffusion
* IFA = Indirect Fluorescent Antibody
* LB = Line Blot
* MPA-TP = Micro-particle Agglutination – *Treponema pallidum*
* PCR = Polymerase Chain Reaction
* WB = Western Blot

# LEESTOWN DIVISION

LOCATION: Basement, Building 1

TELEPHONE: Ext. 3463

HOURS: 8:00 AM to 4:30 PM, Monday through Friday

## GENERAL INFORMATION

Most laboratory testing for patients at the Leestown Division is transported to the Cooper Drive facility via the regularly scheduled mini bus. During regular duty hours, all specimens sent to Cooper Drive from the Leestown Division are to be directed through the laboratory specimen collection area located in Bldg 1, room 26. (This is necessary for early detection of specimen errors.) When the area is closed, all specimens are to be sent to the Cooper Drive laboratory via taxi service. (The Administrative Officer of the Day should receive the taxi delivery and route the specimens to the CDD lab.)

Pathology & Laboratory Medicine’s procedure for specimen transportation is stored on the local area network’s public drive.

(File name: Transporting & Shipping Laboratory Specimens ver \*.docx)

The document is located at the following link:

[\\vhalexfpc01\public\Public - Pathology\LG - Lab General\Procedures,Policies,Reports,References-LG\Active Controlled Documents-LG\Transporting & Shipping Laboratory Specimens ver 10-27-10 PRO.docx](file://vhalexfpc01/public/Public%20-%20Pathology/LG%20-%20Lab%20General/Procedures,Policies,Reports,References-LG/Active%20Controlled%20Documents-LG/Transporting%20&%20Shipping%20Laboratory%20Specimens%20ver%2010-27-10%20PRO.docx)

## DISPOSITION OF BODIES TO MORGUE AT COOPER DRIVE DIVISION

The following procedure is to be followed when there is an autopsy request from the Leestown Division during regular duty hours, Monday through Friday. (Since the Morgue (holding room) at LD is located in the P&LMS space in Bldg 1, room 9, other medical center or contract ambulance service personnel may inquire of P&LMS personnel about the discharge and transport of bodies.)

Health Administration Service (HAS) has responsibility for arranging for discharge &/or transport of bodies.  During regular business hours Mon-Fri, responsibility has been delegated to the Mail Room and Reproduction Clerks to unlock the morgue for the personnel who transport the body to CDD (for autopsy).

## COLLECTION OF SPECIMENS BY LABORATORY SERVICE

* 1. On-ward Collection: LD Inpatient laboratory specimens are collected by Nursing Assistants assigned to the inpatient units. Specimens are to be delivered to the LD laboratory for transport to the CDD laboratory.
  2. LD Laboratory Specimen Collection area: The laboratory staffs and maintains a Leestown Division specimen collection area (location: basement, Bldg. 1, rm 26). The area performs venipuncture, urine collection, and specimen processing and transport for out-patients and ambulatory in-patients. The hours of operation are 8:00 AM to 4:30 PM, Monday through Friday, excluding holidays and weekends.

# COMMUNITY BASED OUTREACH CLINIC (CBOC)

## CBOC SPECIMEN COLLECTION, PROCESSING, AND TRANSPORT

1. Preparation

The accuracy of laboratory test results cannot be assured without appropriate specimen collection, processing, and transport.

Prior to specimen collection it is essential to review the laboratory’s specimen requirements. Note the proper specimen type, amount, collection procedure, collection materials, and post collection handling and storage.

1. Preparing the Patient

Provide the patient with appropriate collection information on fasting, diet, medication restrictions, and clear instructions for any at-home specimen collection procedures.

1. Preparing The Specimen

Confirm patient identification in the presence of the patient. Process and store the specimen as required. (Remember - during specimen collection, preparation, and transport, there is much greater possibility for error than during actual testing or examination of the specimen.)

1. Avoiding Common Errors:

Careful attention to proper procedure can eliminate most errors. The specimen collection system and other materials must be used in strict accordance with the instructions.

1. Common Specimen Collection Errors

* Failure to provide proper patient instructions prior to collection
* Collecting an inadequate quantity of specimen
* Collecting the specimen in an improper tube or container
* Incorrect labeling of the specimen
* Omission of additional, required information
* Failure to tighten the specimen container lid (contributing to specimen leakage)
* Use of an improper preservative or omission of a required preservative
* Specimen storage and transport at an improper temperature

1. Common Serum Processing Errors:

* Failure to separate serum from red cells within 30 minutes of venipuncture
* Failure to allow specimens to clot before centrifugation.
* Hemolysis (damage to red blood cells)

1. Plasma Processing Errors:

* Failure to separate plasma from cells within 30 minutes of venipuncture.
* Failure to mix with proper additive immediately after collection.
* Hemolysis (damage to red cells)
* Incomplete filling of tube resulting in an improper specimen: additive ratio

1. Urine Collection Errors:

* Failure to transfer urine to a required preservation tube.
* Failure to add a proper preservative prior to beginning of a 24 hour collection.
* Failure to provide proper instructions for collection of the urine sample
* Failure to tighten the specimen container lid.

## SPECIMEN LABELING AND IDENTIFICATION:

All specimens must be correctly identified with the patient’s full name, full social security number, test requested, laboratory order number, and date/time of collection. The computer generated labels printed at the CBOCs contain this information when accessioned. The collector should initial the label after collection. When machine generated labels are not available, the above information must be legibly written on the label. The order number must be for the patient identified on the label. If the patient identified on the label and the patient for which the order number exists do not match, the specimen may be discarded and no results will be generated.

## SPECIMEN PREPARATION

1. Preparing Serum:
2. Draw whole blood into a red/gray serum separator or a red top tube. Collect an amount 2- 3 times the required volume of serum so that a sufficient amount of serum can be obtained. (The 10 ml blood collection tube should yield approximately 4-5 ml of serum after clotting and centrifuging.
3. Place the collection tube in an upright position in a rack and allow the blood to clot at room temperature for approximately 20 minutes. (Note: Patient on anticoagulants may take a little longer.)
4. Insert the tube into the centrifuge, stopper end up. Centrifuge the specimen for 10 minutes at appropriate rpm.
5. Once the centrifuge has completely stopped, carefully remove the specimen tube.
6. If required, remove the specimen tube stopper and use a transfer pipet to carefully aspirate the serum. Refrain from disturbing the cell layer or carrying any cells over into the pipet.
7. Transfer the serum into a plastic transport tube carefully labeled with the required patient and test information. (Note: when a separator tube has been used, you may pour the serum into the plastic transport tube.)
8. Inspect the serum for signs of hemolysis and turbidity. Be sure to provide the laboratory with adequate amount of serum.
9. Close the transport tube with an appropriate stopper.
10. Store the specimen at the temperature type stated in the Test Description Information. (Choices should be either frozen, refrigerated, or room temperature.)
11. Preparing Plasma: General Chemistry, Coagulation Testing, Lactic Acid, Heavy Metals
12. Always use the proper vacuum tube for tests requiring a special anticoagulant (eg. EDTA, heparin, sodium citrate, etc) or preservative.
13. Tap the tube gently to release additive adhering to the tube or stopper.
14. Permit the vacuum tube to fill completely. Failure to fill the tube will cause an improper blood-to-anticoagulant ratio and adversely influence the test results.
15. To avoid clotting, mix the blood with the anticoagulant or preservative immediately after drawing each sample. To ensure adequate mixing, slowly invert the tube 5-6 times using a gentle wrist rotation motion.
16. Immediately centrifuge the specimen for 10 minutes at appropriate rpm. Do not remove the stopper prior to centrifugation.
17. When the centrifuge has completely stopped, remove the specimen tube.
18. If required, transfer the plasma into a plastic transport tube carefully labeled with the required patient and test information. Otherwise, leave capped for transport.
19. Inspect the plasma for signs of hemolysis and turbidity. Be sure to provide the laboratory with adequate amount of plasma.
20. Close the transport tube with an appropriate stopper.
21. Store the specimen at the temperature type stated in the Test Description Information. (Choices should be either frozen, refrigerated, or room temperature.)
22. Urinalysis/Urine Culture:
23. When a clean catch specimen is indicated, patients should be given proper instructions and necessary supplies.
24. For Urinalysis, the specimen must immediately be transferred to a urinalysis preservation tube carefully labeled with the required patient and test information.
25. For Urine Culture, the specimen must immediately be transferred to a urine culture transport tube carefully labeled with the required patient and test information.
26. Record the time of collection on the label.
27. 24 Hour Urine Collection:
    1. The 24 hour urine must be collected in a chemically clean, properly labeled urine container. The laboratory will add to the container the proper preservative as needed.
    2. The collection of the 24 hour urine starts with the patient voiding and discarding the first urine passed in the morning. (This date and time must be recorded on the collection container.)
    3. After discard of the first voided urine, ALL urine passed during the subsequent 24 hour period must be placed in the container. The 24 hour urine collection should be ended with the collection, in the specimen container, of final, voided urine exactly 24 hours after the beginning time of the specimen collection. (Urine passed during bowel movements must also be collected.)
    4. If indicated, the entire specimen should be refrigerated at 40 C during collection.
    5. The 24 hour urine may contain a preservative of boric acid or hydrochloric acid. Special care should be taken to avoid contact with hydrochloric acid preservative - it can cause chemical burns. If a preservative is ingested, contact a hospital emergency room immediately. **The patient should be made aware of these hazards.**

## TRANSPORTING SPECIMENS TO LEXINGTON VAMC:

**NOTE: Specimens must be placed in a biohazard specimen transport bag and in opaque privacy bag and carefully sealed before transportation.**

Pathology & Laboratory Medicine’s procedure for specimen transportation is stored on the local area network’s public drive.

(File name: Transporting & Shipping Laboratory Specimens ver \*.docx)

The document is located at the following link:

[https://vaww.v09.r03.portal.va.gov/sites/lexvamc/pathology/DocumentReferences/Transporting and Shipping Laboratory Specimens.docx](https://vaww.v09.r03.portal.va.gov/sites/lexvamc/pathology/DocumentReferences/Transporting%20and%20Shipping%20Laboratory%20Specimens.docx)

## REPORTING OF TEST RESULTS:

Completed results are immediately viewable in VistA/CPRS record. A critical value will be called in accordance with the laboratory policy named **“Reporting of Critical Test Values - Pathology and Laboratory Medicine Service”**.

# TEST INFORMATION – INCLUDING REFERENCE RANGES

(See charts on following pages)

| **Test** | **Accession Area** | **Site/Specimen** | **Reference Lo** | **Reference Hi** | **Units** | **Specimen Collection Container** | **Routinely Performed** | **Routine Turnaround** | **Provider Orderable? (ORD: orderable, NON: results display only)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ALBUMIN | CHEM | SYNOVIAL FLUID | #N/A | #N/A | g/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| ALBUMIN | CHEM | PLASMA | 3.5 | 5.0 | g/dl | GREEN | 24 hr/day | Two hrs | **ORD** |
| ALBUMIN | CHEM | SERUM | 3.1 | 5.5 | g/dl | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| ALBUMIN | CHEM | PLEURAL FLUID | #N/A | #N/A | g/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| ALBUMIN | CHEM | PERITONEAL FLUID | #N/A | #N/A | g/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| ALBUMIN | CHEM | PERICARDIAL FLUID | #N/A | #N/A | g/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| ALBUMIN | CHEM | JP DRAINAGE | #N/A | #N/A | g/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| ALBUMIN | CHEM | FLUID,BODY | #N/A | #N/A | g/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| ALBUMIN | CHEM | ASCITIC FLUID | #N/A | #N/A | g/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| ALK PHOS | CHEM | SERUM or  PLASMA | 38 | 126 | U/L | RED/GREY or GREEN | 24 hr/day | Two hrs | **ORD** |
| ALT | CHEM | SERUM or  PLASMA | 21 | 72 | U/L | RED/GREY or GREEN | 24 hr/day | Two hrs | **ORD** |
| AMMONIA | CHEM | PLASMA | 9 | 30 | umol/L | GREEN | 24 hr/day | Two hrs | **ORD** |
| AMYLASE | CHEM | URINE,24HR | 32 | 641 | U/L | URINE,24HR | 24 hr/day | Two hrs | **ORD** |
| AMYLASE | CHEM | URINE | 32 | 641 | U/L | URINE | 24 hr/day | Two hrs | **ORD** |
| AMYLASE | CHEM | SYNOVIAL FLUID | #N/A | #N/A | U/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| AMYLASE | CHEM | SERUM or  PLASMA | 30 | 110 | U/L | RED/GREY  Or GREEN | 24 hr/day | Two hrs | **ORD** |
| AMYLASE | CHEM | PLEURAL FLUID | #N/A | #N/A | U/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| AMYLASE | CHEM | PERITONEAL FLUID | #N/A | #N/A | #N/A | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| AMYLASE | CHEM | PERICARDIAL FLUID | #N/A | #N/A | U/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| AMYLASE | CHEM | JP DRAINAGE | #N/A | #N/A | U/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| AMYLASE | CHEM | FLUID,BODY | #N/A | #N/A | U/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| AMYLASE | CHEM | ASCITIC FLUID | #N/A | #N/A | U/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| AST | CHEM | SERUM or  PLASMA | 17 | 59 | U/L | RED/GREY or GREEN | 24 hr/day | Two hrs | **ORD** |
| CALCIUM | CHEM | URINE,24HR | 50 | 150 | mg/  24hr | URINE,24HR | 24 hr/day | Two hrs | **ORD** |
| CALCIUM | CHEM | URINE | #N/A | #N/A | mg/dl | URINE | 24 hr/day | Two hrs | **ORD** |
| CALCIUM | CHEM | SERUM | 8.6 | 10.6 | mg/dl | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| CALCIUM | CHEM | PLASMA | 8.4 | 10.2 | mg/dl | GREEN | 24 hr/day | Two hrs | **ORD** |
| CALCULATED or DIRECT LDL-CHOLESTEROL | CHEM | SERUM or PLASMA | 0 | 100 | mg/dl | RED/GREY  or GREEN | 24 hr/day | Two hrs | NON (reflex to dLDL) |
| CFP | CHEM | CEREBROSPINAL FLUID | 12 | 60 | mg/dl | FLUID VIAL | 24 hr/day | Three hrs | **ORD** |
| CHLORIDE | CHEM | URINE,24HR | 110 | 250 | mEq/  24hr | URINE,24HR | 24 hr/day | Two hrs | **ORD** |
| CHLORIDE | CHEM | URINE | #N/A | #N/A | mEq/L | URINE | 24 hr/day | Two hrs | **ORD** |
| CHLORIDE | CHEM | SERUM | 95 | 111 | mmol/L | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| CHLORIDE | CHEM | PLASMA | 98 | 107 | mmol/L | GREEN | 24 hr/day | Two hrs | **ORD** |
| CHLORIDE | CHEM | DIALYSATE | #N/A | #N/A | mEq/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| CHOLESTEROL | CHEM | SERUM or  PLASMA | <200 |  | mg/dl | RED/GREY  or GREEN | 24 hr/day | Two hrs | **ORD** |
| CK TOTAL | CHEM | PLASMA | 55 | 170 | U/L | GREEN | 24 hr/day | Two hrs | NON  (part of panel) |
| CO2 | CHEM | SERUM | 22 | 31 | mmol/L | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| CO2 | CHEM | PLASMA | 22 | 30 | mmol/L | GREEN | 24 hr/day | Two hrs | **ORD** |
| CREATININE | CHEM | URINE,24HR | 800 | 2800 | mg/  24hr | URINE,24HR | 24 hr/day | Two hrs | **ORD** |
| CREATININE | CHEM | URINE | #N/A | #N/A | mg/dl | URINE | 24 hr/day | Two hrs | **ORD** |
| CREATININE | CHEM | SERUM or  PLASMA | Male: 0.66  Female: 0.52 | Male: 1.25  Female: 1.04 | mg/dL | RED/GREY  or GREEN | 24 hr/day | Two hrs | **ORD** |
| CREATININE | CHEM | JP DRAINAGE | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| C-REACTIVE PROTEIN | CHEM | SERUM or  PLASMA | <10 |  | mg/L | RED/GREY  or GREEN | 24 hr/day | Two hrs | **ORD** |
| DIGOXIN | CHEM | SERUM | 0.8 | 2.0 | ng/mL | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| DRUG SCREEN-EXPANDED IN HOUSE | CHEM | URINE | NEG | POS | ng/mL | URINE | 24 hr/day | Two hrs | **ORD** |
| eGFR | CHEM | SERUM or  PLASMA | See Interpretation | See Interpretation | ml/min/1.73m^2 | RED/GREY  or GREEN | 24 hr/day | Two hrs | **ORD** |
| eGFR + CREATININE (CREATININE, eGFR) | CHEM | SERUM or  PLASMA | See Interpretation | See Interpretation | ml/min/1.73m^2 | RED/GREY  or GREEN | 24 hr/day | Two hrs | **ORD** |
| ETHYL ALCOHOL | CHEM | SERUM or  PLASMA | <10 |  | mg/dl | RED/GREY  or GREEN | 24 hr/day | Two hrs | **ORD** |
| GGT | CHEM | SERUM or  PLASMA | 15 | 73 | U/L | RED/GREY  or GREEN | 24 hr/day | Two hrs | **ORD** |
| GLUC TOL TEST (SER) 2HR | CHEM | SERUM or  PLASMA | See Interpretation | See Interpretation | #N/A | RED/GREY  or GREEN | M-F | One hr past last specimen | **ORD** |
| GLUCOSE | CHEM | URINE,24HR | <500 |  | mg/  24hr | URINE,24HR | 24 hr/day | Two hrs | **ORD** |
| GLUCOSE | CHEM | URINE | <30 |  | mg/dl | URINE | 24 hr/day | Two hrs | **ORD** |
| GLUCOSE | CHEM | SYNOVIAL FLUID | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| GLUCOSE | CHEM | SERUM | 65 | 110 | mg/dL | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| GLUCOSE | CHEM | PLASMA | 74 | 106 | mg/dL | GREEN | 24 hr/day | Two hrs |  |
| GLUCOSE | CHEM | PLEURAL FLUID | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| GLUCOSE | CHEM | PERITONEAL FLUID | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| GLUCOSE | CHEM | PERICARDIAL FLUID | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| GLUCOSE | CHEM | JP DRAINAGE | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| GLUCOSE | CHEM | FLUID,BODY | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| GLUCOSE | CHEM | CEREBROSPINAL FLUID | 40 | 70 | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| GLUCOSE | CHEM | ASCITIC FLUID | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| GLYCOHGB. (HPLC) | CHEM | BLOOD | 4.4 | 6.4 | % | LAVENDER | M-F | One-three days | **ORD** |
| HIGH SENSITIVITY C-REACTIVE PROTEIN | CHEM | SERUM or PLASMA | 1 | 3 | mg/L | RED/GREY  or GREEN | 24 hr/day | Two hrs | **ORD** |
| HDL CHOLESTEROL | CHEM | SERUM |  | >40 optimal | mg/dl | RED/GREY | 24 hr/day | Two hrs | NON  (Lipid Profile) |
| HDL CHOLESTEROL | CHEM | PLASMA | ≤40 LOW | ≥60 HIGH | mg/dl | GREEN | 24 hr/day | Two hrs | NON |
| IONIZED CALCIUM | CHEM | PLASMA | 1.06 | 1.26 | mmol/L | GREEN | 24 hr/day | Two hrs | **ORD** |
| IRON | CHEM | SERUM | 49 | 181 | ug/dl | RED/GREY | 24 hr/day | Two hrs | NON  (Fe/TIBC panel) |
| TIBC | CHEM | SERUM | 261 | 462 | ug/dl | RED/GREY | 24 hr/day | Two hrs | NON  (panel) |
| IRON SATURATION | CHEM | SERUM | 12 | 57 | % | RED/GREY | 24 hr/day | Two hrs | NON(panel) |
| LACTIC ACID | CHEM | PLASMA | 0.7 | 2.1 | mmol/L | GRAY | 24 hr/day | Two hrs | **ORD** |
| LDH TOTAL | CHEM | SYNOVIAL FLUID | #N/A | #N/A | U/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| LDH TOTAL | CHEM | SERUM or  PLASMA | 313 | 618 | U/L | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| LDH TOTAL | CHEM | PLEURAL FLUID | #N/A | #N/A | U/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| LDH TOTAL | CHEM | PERITONEAL FLUID | #N/A | #N/A | U/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| LDH TOTAL | CHEM | PERICARDIAL FLUID | #N/A | #N/A | U/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| LDH TOTAL | CHEM | JP DRAINAGE | #N/A | #N/A | U/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| LDH TOTAL | CHEM | FLUID,BODY | #N/A | #N/A | U/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| LDH TOTAL | CHEM | CEREBROSPINAL FLUID | #N/A | #N/A | U/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| LDH TOTAL | CHEM | ASCITIC FLUID | #N/A | #N/A | U/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| LIPASE | CHEM | SERUM or  PLASMA | 23 | 300 | U/L | RED/GREY  or GREEN | 24 hr/day | Two hrs | **ORD** |
| LIPASE | CHEM | JP DRAINAGE | #N/A | #N/A | U/L | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| LIPID PROFILE | CHEM | SERUM or PLASMA | See Interpretation | See Interpretation | #N/A | RED/GREY or GREEN | 24 hr/day | Two hrs | **ORD** |
| LITHIUM | CHEM | SERUM | 0.6 | 1.4 | mEq/L | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| MAGNESIUM | CHEM | URINE,24HR | 73 | 122 | mg/  24 hr | URINE,24HR | 24 hr/day | Two hrs | **ORD** |
| MAGNESIUM | CHEM | URINE | #N/A | #N/A | mg/dl | URINE | 24 hr/day | Two hrs | **ORD** |
| MAGNESIUM | CHEM | SERUM | 1.7 | 2.2 | mg/dL | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| MAGNESIUM | CHEM | PLASMA | 1.6 | 2.3 | mg/dL | GREEN | 24 hr/day | Two hrs | **ORD** |
| PANEL 1 (BMP) - Na,K,Cl,CO2,GLU,UREA,  CREA,Ca,Anion GAP | CHEM | SERUM or  PLASMA | #N/A | #N/A | #N/A | RED/GREY  or GREEN | 24 hr/day | Two hrs | **ORD** |
| PANEL 2 (Hepatic Panel) - AST,ALT,ALKP,TPRO,ALB,TBIL,DBIL | CHEM | SERUM or  PLASMA | #N/A | #N/A | #N/A | RED/GREY  or GREEN | 24 hr/day | Two hrs | **ORD** |
| PANEL 4 (Renal Panel) - Na,K,Cl,CO2,GLU,UREA,  CREA,Ca,AnionGAP,PHOS,Ca,ALB | CHEM | SERUM or  PLASMA | #N/A | #N/A | #N/A | RED/GREY  or GREEN | 24 hr/day | Two hrs | **ORD** |
| PANEL 5 (CMP) - Na,K,Cl,CO2,GLU,UREA,CREA,Ca,Anion GAP,AST,ALT,ALKP,TPRO,ALB,TBIL | CHEM | SERUM or  PLASMA | #N/A | #N/A | #N/A | RED/GREY  or GREEN | 24 hr/day | Two hrs | **ORD** |
| PHOSPHORUS | CHEM | URINE,24HR | 400 | 1300 | mg/  24hr | URINE,24HR | 24 hr/day | Two hrs | **ORD** |
| PHOSPHORUS | CHEM | URINE | #N/A | #N/A | mg/dL | URINE | 24 hr/day | Two hrs | **ORD** |
| PHOSPHORUS | CHEM | SERUM | 2.4 | 4.4 | mg/dL | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| PHOSPHORUS | CHEM | PLASMA | 2.5 | 4.5 | mg/dL | GREEN | 24 hr/day | Two hrs | **ORD** |
| POTASSIUM | CHEM | URINE,24HR | 25 | 125 | mmol/  24hr | URINE,24HR | 24 hr/day | Two hrs | **ORD** |
| POTASSIUM | CHEM | URINE | #N/A | #N/A | mmol/L | URINE | 24 hr/day | Two hrs | **ORD** |
| POTASSIUM | CHEM | SERUM | 3.5 | 5.0 | mmol/L | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| POTASSIUM (PLASMA) | CHEM | PLASMA | 3.5 | 5.0 | mmol/L | GREEN | 24 hr/day | Two hrs | **ORD** |
| PREALBUMIN | CHEM | SERUM | 19 | 37 | mg/dL | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| PREALBUMIN | CHEM | PLASMA | 17.6 | 36.0 | mg/dL | GREEN | 24 hr/day | Two hrs | **ORD** |
| SODIUM | CHEM | URINE,24HR | 40 | 220 | mmol/  24hr | URINE,24HR | 24 hr/day | Two hrs | **ORD** |
| SODIUM | CHEM | URINE | 30 | 90 | mmol/L | URINE | 24 hr/day | Two hrs | **ORD** |
| SODIUM | CHEM | SERUM | 135 | 145 | mmol/L | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| SODIUM | CHEM | PLASMA | 137 | 145 | mmol/L | GREEN | 24 hr/day | Two hrs | **ORD** |
| TOTAL BILIRUBIN | CHEM | SYNOVIAL FLUID | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| TOTAL BILIRUBIN | CHEM | SERUM | 0.0 | 1.5 | mg/dL | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| TOTAL BILIRUBIN | CHEM | PLASMA | 0.2 | 1.3 | mg/dL | GREEN | 24 hr/day | Two hrs | **ORD** |
| TOTAL BILIRUBIN | CHEM | PLEURAL FLUID | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| TOTAL BILIRUBIN | CHEM | PERITONEAL FLUID | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| TOTAL BILIRUBIN | CHEM | PERICARDIAL FLUID | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| TOTAL BILIRUBIN | CHEM | JP DRAINAGE | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| TOTAL BILIRUBIN | CHEM | FLUID,BODY | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| TOTAL BILIRUBIN | CHEM | ASCITIC FLUID | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| TOTAL PROTEIN | CHEM | URINE,24HR | 42 | 225 | mg/  24hr | URINE,24HR | 24 hr/day | Two hrs | **ORD** |
| TOTAL PROTEIN | CHEM | URINE | <12 |  | mg/dl | URINE | 24 hr/day | Two hrs | **ORD** |
| TOTAL PROTEIN | CHEM | SYNOVIAL FLUID | 1 | 3 | g/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| TOTAL PROTEIN | CHEM | SERUM | 6.0 | 8.3 | g/dl | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| TOTAL PROTEIN | CHEM | PLASMA | 6.3 | 8.2 | g/dl | GREEN | 24 hr/day | Two hrs | **ORD** |
| TOTAL PROTEIN | CHEM | PLEURAL FLUID | #N/A | #N/A | g/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| TOTAL PROTEIN | CHEM | PERITONEAL FLUID | #N/A | #N/A | g/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| TOTAL PROTEIN | CHEM | PERICARDIAL FLUID | #N/A | #N/A | g/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| TOTAL PROTEIN | CHEM | JP DRAINAGE | #N/A | #N/A | g/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| TOTAL PROTEIN | CHEM | FLUID,BODY | #N/A | #N/A | g/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| TOTAL PROTEIN | CHEM | ASCITIC FLUID | #N/A | #N/A | g/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| TRIGLYCERIDE | CHEM | SERUM or  PLASMA | <150 Normal |  | mg/dl | RED/GREY  or GREEN | 24 hr/day | Two hrs | **ORD** |
| TRIGLYCERIDE | CHEM | PLEURAL FLUID | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| U. AMPHETAMINES | CHEM | URINE | <1000 NEG | ≥1000 POS | ng/mL | URINE | 24 hr/day | Two hrs | NON  (part of screen) |
| U. BARBITURATE | CHEM | URINE | <200 NEG | ≥200 POS | ng/mL | URINE | 24 hr/day | Two hrs | NON  (part of screen) |
| U. BENZODIAZEP | CHEM | URINE | <200 NEG | ≥200 POS | ng/mL | URINE | 24 hr/day | Two hrs | NON  (part of screen) |
| U. COCAINE MET. | CHEM | URINE | <300 NEG | ≥300 POS | ng/mL | URINE | 24 hr/day | Two hrs | NON  (part of screen) |
| U. OPIATES | CHEM | URINE | <300 NEG | ≥300 POS | ng/mL | URINE | 24 hr/day | Two hrs | NON  (part of screen) |
| U. TETRAHYDROCANN. | CHEM | URINE | <50 NEG | ≥50 POS | ng/mL | URINE | 24 hr/day | Two hrs | NON  (part of screen) |
| U. OXYCODONE | CHEM | URINE | <100 NEG | ≥100 POS | ng/mL | URINE | 24 hr/day | Two hrs | NON  (part of screen) |
| U. METHADONE | CHEM | URINE | <300 NEG | ≥300 POS | ng/mL | URINE | 24 hr/day | Two hrs | NON  (part of screen) |
| UREA NITROGEN | CHEM | URINE,24HR | 12 | 20 | g/24 hr | URINE,24HR | 24 hr/day | Two hrs | **ORD** |
| UREA NITROGEN | CHEM | URINE | #N/A | #N/A | mg/dl | URINE | 24 hr/day | Two hrs | **ORD** |
| UREA NITROGEN | CHEM | SERUM | 7 | 21 | mg/dl | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| UREA NITROGEN | CHEM | PLASMA | 9 | 20 | mg/dl | GREEN | 24 hr/day | Two hrs | **ORD** |
| URIC ACID | CHEM | URINE,24HR | 250 | 700 | mg/  24 hr | URINE,24HR | 24 hr/day | Two hrs | **ORD** |
| URIC ACID | CHEM | URINE | #N/A | #N/A | mg/dl | URINE | 24 hr/day | Two hrs | **ORD** |
| URIC ACID | CHEM | SYNOVIAL FLUID | #N/A | #N/A | mg/dl | FLUID VIAL | 24 hr/day | Two hrs | **ORD** |
| URIC ACID | CHEM | SERUM or  PLASMA | 3.5 | 8.5 | mg/dL | RED/GREY  or GREEN | 24 hr/day | Two hrs | **ORD** |
| URINE LYTES | CHEM | URINE | See Sodium | Potassium | Chloride | URINE | 24 hr/day | Two hrs | **ORD** |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Therapeutic Drugs** | **Accession Area** | **Site/Specimen** | **Therapeutic Lo** | **Therapeutic Hi** | **Units** | **Specimen Collection Container** | **Routinely Performed** | **Routine Turnaround** | **Provider Orderable? (ORD: orderable, NON: results display only)** |
| CARBAMAZEPINE | CHEM | PLASMA | 4 | 12 | ug/ml | GREEN | 24 hr/day | Two hrs | **ORD** |
| CARBAMAZEPINE | CHEM | SERUM | 4 | 12 | ug/ml | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| GENTAMICIN EXTENDED INt | CHEM | PLASMA | "VARIES" | #N/A | ug/ml | GREEN | 24 hr/day | Two hrs | **ORD** |
| GENTAMICIN EXTENDED INT | CHEM | SERUM | "VARIES" | #N/A | ug/ml | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| GENTAMICIN PEAK | CHEM | PLASMA | 8 | 12 | ug/ml | GREEN | 24 hr/day | Two hrs | **ORD** |
| GENTAMICIN PEAK | CHEM | SERUM | 8 | 12 | ug/ml | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| GENTAMICIN TROUGH | CHEM | PLASMA | #N/A | 2 | ug/ml | GREEN | 24 hr/day | Two hrs | **ORD** |
| GENTAMICIN TROUGH | CHEM | SERUM | #N/A | 2 | ug/ml | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| PHENOBARBITAL | CHEM | PLASMA | 15 | 40 | ug/mL | GREEN | 24 hr/day | Two hrs | **ORD** |
| PHENOBARBITAL | CHEM | SERUM | 15 | 40 | ug/mL | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| PHENYTOIN | CHEM | PLASMA | 10 | 20 | ug/ml | GREEN | 24 hr/day | Two hrs | **ORD** |
| PHENYTOIN | CHEM | SERUM | 10 | 20 | ug/ml | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| THEOPHYLLINE | CHEM | PLASMA | 10 | 20 | ug/ml | GREEN | 24 hr/day | Two hrs | **ORD** |
| THEOPHYLLINE | CHEM | SERUM | 10 | 20 | ug/ml | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| TOBRAMYCIN EXTENDED INT | CHEM | PLASMA | "VARIES" | #N/A | ug/ml | GREEN | 24 hr/day | Two hrs | **ORD** |
| TOBRAMYCIN EXTENDED INT | CHEM | SERUM | "VARIES" | #N/A | ug/ml | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| TOBRAMYCIN PEAK | CHEM | PLASMA | 8 | 12 | ug/ml | GREEN | 24 hr/day | Two hrs | **ORD** |
| TOBRAMYCIN PEAK | CHEM | SERUM | 8 | 12 | ug/ml | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| TOBRAMYCIN TROUGH | CHEM | PLASMA | #N/A | 2 | ug/ml | GREEN | 24 hr/day | Two hrs | **ORD** |
| TOBRAMYCIN TROUGH | CHEM | SERUM | #N/A | 2 | ug/ml | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| VALPROIC ACID | CHEM | SERUM | 50 | 120 | ug/ml | GREEN | 24 hr/day | Two hrs | **ORD** |
| VALPROIC ACID | CHEM | PLASMA | 50 | 120 | ug/ml | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| VANCOMYCIN (RANDOM) | CHEM | SERUM | #N/A | #N/A | ug/ml | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| VANCOMYCIN PEAK | CHEM | SERUM | 30 | 40 | ug/ml | RED/GREY | 24 hr/day | Two hrs | **ORD** |
| VANCOMYCIN TROUGH | CHEM | SERUM | 10 | 20 | ug/ml | RED/GREY | 24 hr/day | Two hrs | **ORD** |

| **Test** | **Accession Area** | **Site/Specimen** | **Reference Lo** | **Reference Hi** | **Units** | **Specimen Collection Container** | **Routine Turnaround** | **Routinely Performed** | **Provider Orderable? (ORD: orderable, NON: results display only)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| B12 VITAMIN | SCHEM | SERUM or  PLASMA | 239 | 931 | pg/ml | RED/GREY  or GREEN | Three hrs | M-Friday | **ORD** |
| NTproBNP | SCHEM | BLOOD | <300 |  | pg/ml | LAVENDER | Two hrs | 24 hr/day | **ORD** |
| CK MB Panel (Total) | SCHEM | PLASMA | 55 | 170 | U/L | GREEN | Two hrs | 24 hr/day | **ORD Panel** |
| CK MB ISOENZYME (reflex) | SCHEM | PLASMA | 0.0 | 5.0 | ng/mL | GREEN | Two hrs | 24 hr/day | NON – added if  CK > 150 |
| RELATIVE INDEX | SCHEM | PLASMA | <3% Normal |  | % | GREEN | Two hrs | 24 hr/day | NON –calc if  CKMB added |
| CORTISOL | SCHEM | SERUM or  PLASMA | 4.46  before 10am | 22.7  before 10am | ug/dl | RED/GREY  or GREEN | Two hrs | M-Friday | **ORD** |
|  |  |  | 1.7  after 5pm | 14.1  after 5pm |  |  |  |  |  |
| CORTROSYN STIMULATION TEST | SCHEM | SERUM or  PLASMA | #N/A-timed  response | #N/A –timed  response | ug/dl | RED/GREY  or GREEN | Two hrs | M-Friday | **ORD** |
| FERRITIN | SCHEM | SERUM or  PLASMA | 17.9 | 464 | ng/mL | RED/GREY  or GREEN | Two hrs | M-Friday | **ORD** |
| FOLATE | SCHEM | SERUM or  PLASMA | 2.76 | >20 | ng/mL | RED/GREY  or GREEN | Three  hrs | M-Friday | **ORD** |
| FREE T4 | SCHEM | SERUM | 0.78 | 2.19 | ng/dl | RED/GREY | Two hrs | M-Friday | **ORD** |
| T3 TOTAL | SCHEM | SERUM or  PLASMA | 0.97 | 1.69 | ng/mL | RED/GREY  or GREEN | Two hrs | M-Friday | **ORD** |
| TESTOSTERONE | SCHEM | SERUM or  PLASMA | 132 Male  (20 – 49yrs)  71.8 Male  (>50 yrs)  5.71 Female | 813 Male  (20 -49yrs)  623 Male  (>50yrs)  77.0 Females | ng/dL | RED/GREY or GREEN | Two hrs | M-Friday | **ORD** |
| THYROID PROFILE | SCHEM | SERUM | See TSH | and FT4 | #N/A | RED/GREY | Two hrs | M-Friday | **ORD** |
| TROPONIN I | SCHEM | PLASMA | <0.012 | (see interpretation) | ng/mL | GREEN | Two hrs | 24 hr/day | **ORD** |
| TSH | SCHEM | SERUM or  PLASMA | 0.465 | 4.68 | uIU/mL | RED/GREY  or GREEN | Two hrs | M-Friday | **ORD** |

| **Test** | **Accession Area** | **Site/Specimen** | **Reference Lo** | **Reference Hi** | **Units** | **Specimen Collection Container** | **Routinely Performed** | **Routine Turnaround** | **Provider Orderable? (ORD: orderable, NON: results display only)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A-BASO # | HEM | BLOOD | 0.0 | 0.2 | k/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| A-BASO % | HEM | BLOOD | 0 | 3 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| A-EOS # | HEM | BLOOD | 0.0 | 0.7 | k/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| A-EOS % | HEM | BLOOD | 0 | 10 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| A-GRAN # | HEM | BLOOD | 1.4 | 6.5 | k/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| A-GRAN % | HEM | BLOOD | 42 | 75 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| A-LYMPH # | HEM | BLOOD | 1.2 | 3.4 | k/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| A-LYMPH % | HEM | BLOOD | 24 | 44 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| A-MONO # | HEM | BLOOD | 0.1 | 0.6 | k/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| A-MONO % | HEM | BLOOD | 0 | 6 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| BLAST LIKE CELLS | HEM | BLOOD | 0 | 0 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| CBC/PLT | HEM | BLOOD | #N/A | #N/A | #N/A | LAVENDER | 24 hr/day | Four hrs | **ORD** |
| CELL COUNT/DIFF (FLUID) | HEM | (FLUID) | #N/A | #N/A | #N/A | LAVENDER | 24 hr/day | Four hrs | **ORD** |
| CRYSTALS-FLUID | HEM | SYNOVIAL FLUID | "none seen" | #N/A | #N/A | GREEN | 24 hr/day | Four hrs | **ORD** |
| CRYSTALS-FLUID | HEM | FLUID,TOPHUS | #N/A | #N/A | #N/A | GREEN | 24 hr/day | Four hrs | **ORD** |
| HGB & HCT | HEM | BLOOD | #N/A | #N/A | #N/A | LAVENDER | 24 hr/day | Four hrs | **ORD** |
| M-ATYPICAL LYMPHS | HEM | BLOOD | 0 | 0 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| M-BANDS | HEM | BLOOD | 0 | 15 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| M-BASO | HEM | BLOOD | 0 | 3 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| M-BLASTS | HEM | BLOOD | 0 | 0 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| M-EOSINO | HEM | BLOOD | 0 | 10 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| M-LYMPHS | HEM | BLOOD | 24 | 44 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| M-META | HEM | BLOOD | 0 | 0 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| M-MONOS | HEM | BLOOD | 0 | 6 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| M-MYELO | HEM | BLOOD | 0 | 0 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| M-PLASMA CELLS | HEM | BLOOD | 0 | 0 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| M-PROS | HEM | BLOOD | 0 | 0 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| M-SEGS | HEM | BLOOD | 42 | 75 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| MANUAL DIFF (FLUID) | HEM | (FLUID) | #N/A | #N/A | #N/A | LAVENDER | 24 hr/day | Four hrs | NON |
| MANUAL DIFF CELLS | HEM | BLOOD | #N/A | #N/A | #N/A | LAVENDER | 24 hr/day | Four hrs | NON |
| MCH | HEM | BLOOD | 27 | 31 | pg | LAVENDER | 24 hr/day | Four hrs | NON |
| MCHC | HEM | BLOOD | 32 | 36 | g/dl | LAVENDER | 24 hr/day | Four hrs | NON |
| MCV | HEM | BLOOD | MALE-80 FEMALE-79 | MALE-94 FEMALE-97 | fl | LAVENDER | 24 hr/day | Four hrs | NON |
| MPV | HEM | BLOOD | 7.4 | 10.4 | um3 | LAVENDER | 24 hr/day | Four hrs | NON |
| NRBC/100 WBC | HEM | BLOOD | 0 | 0 | # | LAVENDER | 24 hr/day | Four hrs | NON |
| RBC | HEM | BLOOD | MALE-4.6 FEMALE-4.2 | MALE-6.2 FEMALE:5.4 | M/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| RBC | HEM | CEREBROSPINAL FLUID | #N/A | 0 | #/cmm | CLEAR SCREW TOP FLUID VIAL | 24 hr/day | Four hrs | NON |
| RBC | HEM | ASCITIC FLUID | #N/A | #N/A | #/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| RBC | HEM | PLEURAL FLUID | #N/A | 0 | #/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| RBC | HEM | SYNOVIAL FLUID | #N/A | 0 | #/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| RBC | HEM | PERICARDIAL FLUID | #N/A | 0 | #/CMM | LAVENDER | 24 hr/day | Four hrs | NON |
| RBC | HEM | DIALYSATE | #N/A | #N/A | #/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| RBC | HEM | PERITONEAL FLUID | 0 | #N/A | #/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| RETIC COUNT (AUTOMATED) | HEM | BLOOD | 0.45 | 2.28 | % | LAVENDER | 24 hr/day | Four hrs | **ORD** |
| SED RATE (WESTERGREN) | HEM | BLOOD | 0 | 20 | mm/hr | LAVENDER | 24 hr/day | Four hrs | **ORD** |
| SEGMENTED CELLS | HEM | CEREBROSPINAL FLUID | #N/A | #N/A | % | LAVENDER | 24 hr/day | Four hrs | NON |
| SEGMENTED CELLS | HEM | ASCITIC FLUID | #N/A | #N/A | % | LAVENDER | 24 hr/day | Four hrs | NON |
| SEGMENTED CELLS | HEM | PLEURAL FLUID | 0 | 24 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| SEGMENTED CELLS | HEM | SYNOVIAL FLUID | 0 | 24 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| SEGMENTED CELLS | HEM | PERICARDIAL FLUID | 0 | 24 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| SEGMENTED CELLS | HEM | DIALYSATE | #N/A | #N/A | % | LAVENDER | 24 hr/day | Four hrs | NON |
| SEGMENTED CELLS | HEM | PERITONEAL FLUID | 0 | 24 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| WBC | HEM | BLOOD | 5.0 | 10.0 | K/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| WBC | HEM | CEREBROSPINAL FLUID | 0 | 5 | #/cmm | CLEAR SCREW TOP FLUID VIAL | 24 hr/day | Four hrs | NON |
| WBC | HEM | ASCITIC FLUID | #N/A | #N/A | #/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| WBC | HEM | PLEURAL FLUID | 0 | 999 | #/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| WBC | HEM | SYNOVIAL FLUID | 0 | 200 | #/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| WBC | HEM | PERICARDIAL FLUID | 0 | 499 | #/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| WBC | HEM | DIALYSATE | #N/A | #N/A | #N/A | LAVENDER | 24 hr/day | Four hrs | NON |
| WBC | HEM | PERITONEAL FLUID | 0 | 499 | #/cmm | LAVENDER | 24 hr/day | Four hrs | NON |
| HEMATOCRIT | HEM | BLOOD | MALE-42 FEMALE-37 | MALE-52  FEMALE-47 | % | LAVENDER | 24 hr/day | Four hrs | NON |
| HEMATOCRIT | HEM | FLUID- PLEURAL SYNOVIAL, PERITONEAL | 0 | 0 | % | LAVENDER | 24 hr/day | Four hrs | Non |
| HEMOGLOBIN | HEM | BLOOD | MALE-14 FEMALE-12 | MALE-18  FEMALE-16 | g/dL | LAVENDER | 24 hr/day | Four hrs | NON |
| PLATELET COUNT | HEM | BLOOD | 150 | 450 | K/cmm | LAVENDER | 24 hr/day | Four hrs | **ORD** |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Test** | **Accession Area** | **Site/Specimen** | **Reference Lo** | **Reference Hi** | **Units** | **Specimen Collection Container** | **Routinely Performed** | **Routine Turnaround** | **Provider Orderable? (ORD: orderable, NON: results display only)** |
| EOSINOPHIL SMEAR | SHEM | URINE | "No eosinophils seen" | #N/A | #N/A | STERILE SPECIMEN CUP | M-F 3 pm Cutoff | same day | **ORD** |
| EOSINOPHIL SMEAR | SHEM | SPUTUM | "No eosinophils seen" | #N/A | #N/A | STERILE SPECIMEN CUP | M-F 3 pm Cutoff | same day | **ORD** |
| EOSINOPHIL SMEAR | SHEM | NASAL MUCUS | "No eosinophils seen" | #N/A | #N/A | STERILE SPECIMEN CUP | M-F 3 pm Cutoff | same day | **ORD** |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Test** | **Accession Area** | **Site/Specimen** | **Reference Lo** | **Reference Hi** | **Units** | **Specimen Collection Container** | **Routine Turnaround** | **Routinely Performed** | **Provider Orderable? (ORD: orderable, NON: results display only)** |
| D DIMER | COAG | PLASMA | 0.00 | >0.50 | ug/ml FEU | BLUE | Two hrs | 24 hr/day | **ORD** |
| FIBRINOGEN | COAG | PLASMA | 245 | 470 | mg/dl | BLUE | Two hrs | 24 hr/day | **ORD** |
| PROTHROMBIN TIME | COAG | PLASMA | #N/A | #N/A | #N/A | BLUE | Two hrs | 24 hr/day | **ORD** |
| INTERNATIONAL NORMALIZED RATIO | COAG | PLASMA | 0.89 | 1.13 | #N/A | BLUE | Two hrs | 24 hr/day | NON |
| PT PATIENT | COAG | PLASMA | 11.7 | 14.2 | seconds | BLUE | Two hrs | 24 hr/day | NON |
| PARTIAL THROMBOPLASTIN TIME | COAG | PLASMA | #N/A | #N/A | #N/A | BLUE | Two hrs | 24 hr/day | **ORD** |
| PTT PATIENT (Non-heparinized patient) | COAG | PLASMA | 23 | 36 | seconds | BLUE | Two hrs | 24 hr/day | NON |
| PTT PATIENT (Heparin therapeutic range 0.3-0.7 anti-Xa) | COAG | PLASMA | 63 | 99 | seconds | BLUE | Two hrs | 24 hr/day | NON |
| PTT NORMAL MEAN | COAG | PLASMA | #N/A | #N/A | seconds | BLUE | Two hrs | 24 hr/day | NON |

| **Test** | **Accession Area** | **Site/Specimen** | **Reference Lo** | **Reference Hi** | **Units** | **Specimen Collection Container** | **Routine Turnaround** | **Routinely Performed** | **Provider Orderable? (ORD: orderable, NON: results display only)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1/2Hr.GTT (URINE) | URIN | URINE | "<50 mg/dl" | #N/A | mg/dl | STERILE SPECIMEN CUP | Two hrs | One hr past last specimen | NON |
| 1Hr.GTT (URINE) | URIN | URINE | "<50 mg/dl" | #N/A | mg/dl | STERILE SPECIMEN CUP | Two hrs | One hr past last specimen | NON |
| 2Hr.GTT (URINE) | URIN | URINE | "<50 mg/dl" | #N/A | mg/dl | STERILE SPECIMEN CUP | Two hrs | One hr past last specimen | NON |
| 3Hr.GTT (URINE) | URIN | URINE | "<50 mg/dl" | #N/A | mg/dl | STERILE SPECIMEN CUP | Two hrs | One hr past last specimen | NON |
| AMORPH CRYSTAL (i) | URIN | URINE | "none" | #N/A | graded/uL | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| APPEARANCE | URIN | URINE | "clear" | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| BILIRUBIN CRYSTALS/HPF | URIN | URINE | "none" | #N/A | graded/HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| BUDDING YEAST (i) | URIN | URINE | "none" | #N/A | graded/HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| CA CARB CRYSTAL (i) | URIN | URINE | "none" | #N/A | graded/HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| CA OXAL CRYSTAL (i) | URIN | URINE | "none" | #N/A | graded/HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| CA PHOS CRYSTAL (i) | URIN | URINE | "none" | #N/A | graded/HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| CYSTINE CRYSTAL (i) | URIN | URINE | "none" | #N/A | graded/HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| EPITHELIAL CAST (i) | URIN | URINE | "none" | #N/A | /LPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| FASTING GTT (URINE) | URIN | URINE | "<50 mg/dl" | #N/A | mg/dl | STERILE SPECIMEN CUP | Two hrs | One hr past last specimen | NON |
| FATTY CASTS (i) | URIN | URINE | "none" | #N/A | /LPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| HCG BETA (SCREEN) | URIN | URINE | #N/A | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | **ORD** |
| HYALINE CASTS (i) | URIN | URINE | 0 | 2 | /LPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| HYPHAE YEAST (i) | URIN | URINE | "none" | #N/A | graded/HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| KETONES | URIN | SERUM | "neg" | #N/A | #N/A | RED | Two hrs | 24 hr/day | **ORD** |
| LEUCINE CRYSTAL (i) | URIN | URINE | "none" | #N/A | graded/HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| MUCUS (FECES) | URIN | FECES | "not present" | #N/A | #N/A | SPECIMEN CUP | Two hrs | 24 hr/day | **ORD** |
| MYOGLOBIN SCREEN (URINE) | URIN | URINE | "neg" | #N/A | #N/A | URINE | Two hrs | 24 hr/day | **ORD** |
| OCCULT BLOOD (FIT) #1 OF 1 | URIN | FECES | “Negative” | #N/A | #N/A | FOB TEST CARD | N/A | BATCH TESTING | NON |
| OCCULT BLOOD FIT X1 SCREEN | URIN | FECES | #N/A | #N/A | #N/A | 3 FOB TEST CARDs | N/A | BATCH TESTING | **ORD** |
| OCCULT BLOOD (GASTRIC) | URIN | GASTRIC CONTENTS | “Negative” | #N/A | #N/A | SPECIMEN CUP | Two hrs | 24 hr/day | **ORD** |
| OCCULT BLOOD (single) | URIN | FECES | “Negative” | #N/A | #N/A | FOB TEST CARD or SPECIMEN CUP | Two hrs | 24 hr/day | **ORD** |
| OSMOLALITY | URIN | URINE | 38 | 1400 | mOsm/kg | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | **ORD** |
| OSMOLALITY | URIN | SERUM | 280 | 300 | mOsm/kg | RED/GREY SP | Two hrs | 24 hr/day | **ORD** |
| OVAL FAT BODIES (i) | URIN | URINE | "none" | #N/A | graded/HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| PH (BODY FLUIDS) | URIN | ASCITIC FLUID | #N/A | #N/A | pH Units | FLUID TUBE | Two hrs | 24 hr/day | **ORD** |
| PH (BODY FLUIDS) | URIN | PLEURAL FLUID | #N/A | #N/A | pH Units | FLUID TUBE | Two hrs | 24 hr/day | **ORD** |
| PH (BODY FLUIDS) | URIN | PERICARDIAL FLUID | #N/A | #N/A | pH Units | FLUID TUBE | Two hrs | 24 hr/day | **ORD** |
| PH (BODY FLUIDS) | URIN | GASTRIC CONTENTS | #N/A | 1.9 | pH Units | FLUID TUBE | Two hrs | 24 hr/day | **ORD** |
| PH (BODY FLUIDS) | URIN | SEMINAL FLUID | 7.2 | 8.0 | pH Units | STERILE SPECIMEN CUP | Two hrs | M-F before 12:00 hrs | **ORD** |
| PH (BODY FLUIDS) | URIN | PERITONEAL FLUID | #N/A | #N/A | #N/A | FLUID TUBE | Two hrs | 24 hr/day | **ORD** |
| RBC CASTS (i) | URIN | URINE | "none" | #N/A | /LPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| RENAL EPITHELAL(i) | URIN | URINE | #N/A | 0 | /HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| RTE CASTS | URIN | URINE | "none" | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| SPECIFIC GRAVITY | URIN | URINE | 1.005 | 1.030 | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | **ORD** |
| SPECIFIC GRAVITY | URIN | ASCITIC, PLEURAL, PERICARDIAL, or PERITONEAL FLUID | #N/A | #N/A | #N/A | FLUID TUBE | Two hrs | 24 hr/day | **ORD** |
| SPECIMEN CONTAINER (SEMEN ANAL) | URIN | SEMINAL FLUID | #N/A | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| SPERM CELLS (i) | URIN | URINE | "none" | #N/A | graded/HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| SPERM COUNT w/o MOTILITY, POST VAS | URIN | SEMINAL FLUID | #N/A | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | M-F before 12:00 hrs | **ORD** |
| SPERM COUNT(TOTAL IN-SPECIMEN) | URIN | SEMINAL FLUID | 40 | #N/A | MILLION | STERILE SPECIMEN CUP | Two hrs | M-F before 12:00 hrs | NON |
| SPERM COUNT-POST VAS | URIN | SEMINAL FLUID | "none seen" | #N/A | million | STERILE SPECIMEN CUP | Two hrs | M-F before 12:00 hrs | NON |
| SQUAMOUS EPITHEL (i) | URIN | URINE | 0 | 28 | /LPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| STARCH CRYSTALS | URIN | URINE | "none" | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| SULFA CRYSTALS | URIN | URINE | "none" | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| TRANSFUSION WORKUP (URINE) | URIN | URINE | #N/A | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | **ORD** |
| TRANSITIONAL EPI(i) | URIN | URINE | #N/A | 0 | /HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| TRI PHOS CRYSTAL (i) | URIN | URINE | "none" | #N/A | graded/HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| TRICHOMONAS (i) | URIN | URINE | "none" | #N/A | graded/HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| TYROSINE CRYSTAL(i) | URIN | URINE | "none" | #N/A | graded/HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URIC A. CRYSTAL (i) | URIN | URINE | "none" | #N/A | graded/HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINALYSIS | URIN | URINE | #N/A | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | **ORD** |
| URINE BACTERIA (i) | URIN | URINE | "none" | #N/A | graded/HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINE BILIRUBIN | URIN | URINE | "neg" | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINE BLOOD | URIN | URINE | "neg" | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINE COLOR | URIN | URINE | "yellow or colorless" | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINE GLUCOSE | URIN | URINE | "neg" | #N/A | MG/DL | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINE HEMOSIDERIN | URIN | URINE | "neg" | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | **ORD** |
| URINE KETONES | URIN | URINE | "neg" | #N/A | mg/dl | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINE LEUKOCYTE EST | URIN | URINE | "neg" | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINE MICROSCOPIC EXAM | URIN | URINE | #N/A | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINE MUCOUS (i) | URIN | URINE | "none" | #N/A | graded/LPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINE NITRITE | URIN | URINE | "neg" | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINE PH | URIN | URINE | 4.5 | 8.0 | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINE PROTEIN | URIN | URINE | "neg" | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINE RBC (i) | URIN | URINE | 0 | 3 | /HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINE RBC CASTS | URIN | URINE | "none" | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINE WBC (i) | URIN | URINE | 0 | 3 | /HPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| URINE WBC CASTS | URIN | URINE | "none" | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| UROBILINOGEN | URIN | URINE | 0.0 | 2.0 | mg/dL | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| WAXY CASTS (i) | URIN | URINE | "none" | #N/A | /LPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| WBC CASTS (i) | URIN | URINE | "none" | #N/A | /LPF | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |
| WBC FECES | URIN | URINE | "none" | #N/A | #N/A | STERILE SPECIMEN CUP | Two hrs | 24 hr/day | NON |

| **Test** | **Accession Area** | **Site/Specimen** | **Reference Lo** | **Reference Hi** | **Units** | **Specimen Collection Container** | **Routinely Performed** | **Routine Turnaround** | **Provider Orderable? (ORD: orderable, NON: results display only)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ANTI-DNA Ab | SRL | SERUM | #N/A | "NEG <1:10" | #N/A | RED/GREY | M-F | One-three days | **ORD** |
| ANTI-JO-1 | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| ANTI-LA/SS-B | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| ANTI-NUCLEAR Ab | SRL | SERUM | "NEG<1:40" | #N/A | #N/A | RED/GREY | M-F | One-three days | **ORD** |
| ANTI-RO/SS-A | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| ANTI-SCL-70 | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| ANTI-SM/RNP | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| ANTI-SMITH | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| ASP. FUM. TYPE 6 | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | Two-four days | NON |
| ASPERGILLUS-CF | SRL | PLEURAL FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Weekly | Two-eight days | NON |
| ASPERGILLUS-CF | SRL | CEREBROSPINAL FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Weekly | Two-eight days | NON |
| ASPERGILLUS-CF | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| ASPERGILLUS-ID | SRL | CEREBROSPINAL FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Weekly | Two-eight days | NON |
| ASPERGILLUS-ID | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| AUREO. PULLULANS | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | Two-four days | NON |
| BLASTOMYCES-CF | SRL | PLEURAL FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Weekly | Two-eight days | NON |
| BLASTOMYCES-CF | SRL | CEREBROSPINAL FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Weekly | Two-eight days | NON |
| BLASTOMYCES-CF | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| BLASTOMYCES-ID | SRL | CEREBROSPINAL FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Weekly | Two-eight days | NON |
| BLASTOMYCES-ID | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| CMV (IGG & IGM) | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| CMV-IGG-EIA | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| CMV-IGM-EIA | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| COCC. IMMITIS-CF | SRL | PLEURAL FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Weekly | Two-eight days | NON |
| COCC. IMMITIS-CF | SRL | CEREBROSPINAL FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Weekly | Two-eight days | NON |
| COCC. IMMITIS-CF | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| COCC. IMMITIS-ID | SRL | CEREBROSPINAL FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Weekly | Two-eight days | NON |
| COCC. IMMITIS-ID | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| COCC. IMMITIS-LATEX | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| EBV AB-COMPREHENSIVE PANEL | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| EBV EARLY AG AB IGG | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Twice Weekly | One-four days | NON |
| EBV VCA IgM | SRL | SERUM | NEGATIVE" | #N/A | #N/A | RED/GREY | Twice Weekly | One-four days | NON |
| EBV NUCLEAR AB IGG | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Twice Weekly | One-four days | NON |
| EBV VCA IgG | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Twice Weekly | One-four days | NON |
| ENA PROFILE | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| ENA SCREEN | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| FARMER'S LUNG PANEL | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | M-F | Two-six days | **ORD** |
| FUNGAL SEROLOGY | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| H. PYLORI AB | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| HBSAB | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | One-three days | NON |
| HBSAB (SRL) | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | M-F | One-three days | **ORD** |
| HBSAG | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | One-three days | NON |
| HBSAG (SRL) | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | M-F | One-three days | **ORD** |
| HCV (SRL) | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | M-F | One-three days | **ORD** |
| HEP C Ab | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | One-three days | NON |
| HEP C GENOTYPING | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| HEP C PCR (IU/ML) | SRL | SERUM | "NOT DETECTED" | #N/A | IU/mL | RED/GREY | Weekly | Two-eight days | NON |
| EBV VCA IgM | SRL | SERUM | NEGATIVE" | #N/A | #N/A | RED/GREY | Twice Weekly | One-four days | NON |
| EBV NUCLEAR AB IGG | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Twice Weekly | One-four days | NON |
| EBV VCA IgG | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Twice Weekly | One-four days | NON |
| ENA PROFILE | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| ENA SCREEN | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| FARMER'S LUNG PANEL | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | M-F | Two-six days | **ORD** |
| FUNGAL SEROLOGY | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| H. PYLORI AB | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| HBSAB | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | One-three days | NON |
| HBSAB (SRL) | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | M-F | One-three days | **ORD** |
| HBSAG | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | One-three days | NON |
| HBSAG (SRL) | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | M-F | One-three days | **ORD** |
| HCV (SRL) | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | M-F | One-three days | **ORD** |
| HEP C Ab | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | One-three days | NON |
| HEP C GENOTYPING | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| .HIV AB SCREEN | SRL | SERUM | "NONREACTIVE" | #N/A | #N/A | RED/GREY | Twice Weekly | One-five days | NON |
| HIV-WESTERN BLOT | SRL | SERUM | "NONREACTIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| HSV TY-1 IGG AB | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | One-three days | NON |
| HSV TY-2 IGG AB | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | One-three days | NON |
| HSV TYPES 1&2-IGG AB | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | M-F | One-three days | **ORD** |
| LK MICROSOMAL Ab | SRL | SERUM | #N/A | "NEG<1:20" | #N/A | RED/GREY | M-F | One-three days | **ORD** |
| LYME CONFIRMATION | SRL | SERUM | #N/A | "NEGATIVE" | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| LYME EIA SCREEN | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | One-three days | **ORD** |
| MEASLES (RUBEOLA) | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| MHA-TP | SRL | SERUM | "NON-REACTIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| MICROPOLYSPORO FAENI | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | Two-four days | NON |
| MITOCHONDRIAL Ab | SRL | SERUM | #N/A | "NEG<1:20" | #N/A | RED/GREY | M-F | One-three days | **ORD** |
| MUMPS IMMUNITY IGG | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| MYCO PNEUMONIAE-IgG | SRL | SERUM | |  |  | | --- | --- | | "NEGATIVE" | #N/A | | #N/A | U/mL | RED/GREY | Weekly | Two-eight days | NON |
| MYCO PNEUMONIAE-IgM | SRL | SERUM | |  |  | | --- | --- | | "NEGATIVE" | #N/A | | #N/A | U/mL | RED/GREY | Weekly | Two-eight days | NON |
| MYCOPLASMA PNEUMONIAE | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| PARIETAL CELL Ab | SRL | SERUM | #N/A | "NEG <1:20" | #N/A | RED/GREY | M-F | One-three days | **ORD** |
| PIGEON SERUM | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | Two-four days | NON |
| RUBELLA IgG AB | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| SMOOTH MUSCLE Ab | SRL | SERUM | #N/A | "NEG<1:20" | #N/A | RED/GREY | M-F | One-three days | **ORD** |
| T-ACTINO. CANDIDUS | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | Two-four days | NON |
| T-ACTINO. VIRIDIS | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | Two-four days | NON |
| T-ACTINO. VULGARIS | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | M-F | Two-four days | NON |
| TOXOPLASMA IgG AB | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| TOXOPLASMA IGG&IGM PANEL | SRL | SERUM | #N/A | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| TOXOPLASMA IgM AB | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | NON |
| VARICELLA-ZOSTER IgG | SRL | SERUM | "NEGATIVE" | #N/A | #N/A | RED/GREY | Weekly | Two-eight days | **ORD** |
| VITAMIN D 25-HYDROXY | SERO | SERUM | 30 | 100 | ng/mL | RED/GRAY | M-F | Same day | **ORD** |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Test** | **Accession Area** | **Site/Specimen** | **Reference Lo** | **Reference Hi** | **Units** | **Specimen Collection Container** | **Routinely Performed** | **Routine Turnaround** | **Provider Orderable? (ORD: orderable, NON: results display only)** |
| CRYPTOCOCCAL ANTIGEN (lateral flow assay) | SERO | CEREBROSPINAL FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | DAILY | Same Day | **ORD** |
| CRYPTOCOCCAL ANTIGEN (lateral flow assay) | SERO | SERUM | "NEGATIVE" | #N/A | #N/A | RED | DAILY | Same Day | **ORD** |
| LEGIONELLA URINARY AG | SERO | URINE | "NEGATIVE" | #N/A | ORDINAL | Urine – standard container | DAILY | Same Day | **ORD** |
| STREPTOCOCCUS PNEUMONIAE URINARY AG | SERO | URINE | “NEGATIVE” | #N/A | ORDINAL | Urine – standard container | DAILY | Same Day | **ORD** |
| MRSA DNA DETECTION | SERO | NASAL MUCUS | "NEGATIVE" | #N/A | ORDINAL | SWAB, NARES ANTERIOR | As requested | One day | **ORD** |
| RHEUMATOID FACTOR | SERO | SERUM | "<10 NEGATIVE" | #N/A | IU/mL | RED/GREY | M-F 12pm Cutoff | One-three days | **ORD** |
| RPR | SERO | SERUM | "NR (non-reactive)" | #N/A | #N/A | RED/GREY | Twice per week | One-three days | **ORD** |

| **Test** | **Accession Area** | **Site/Specimen** | **Reference Lo** | **Reference Hi** | **Units** | **Specimen Collection Container** | **Routinely Performed** | **Routine Turnaround** | **Provider Orderable? (ORD: orderable, NON: results display only)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MULTI-DRUG RESISTANT ORGANISM SCREEN (MDRO) | MICRO | (SWAB) BILATERAL AXILLA REGION, BILATERAL GROIN REGION, PERIRECTAL REGION | "NO GROWTH" | #N/A | #N/A | SWAB as appropriate | As requested | Two days | **ORD** |
| BLOOD CULTURE | BC | BLOOD | "NO GROWTH" | #N/A | #N/A | Aerobic and anaerobic blood culture bottle | As requested | Five days | **ORD** |
| CULTURE, ABSCESS | MICRO | Various body sites | “NO AEROBIC OR ANAEROBIC GROWTH” | #N/A | #N/A | ANAEROBIC COLLECTION TUBE or SWAB | As  requested | Two-five days | **ORD** |
| CULTURE, ASPIRATE | MICRO | Various body sites | “NO AEROBIC OR ANAEROBIC GROWTH” | #N/A | #N/A | Syringe (with needle removed) , ANAEROBIC COLLECTION Tube or Swab | As  requested | Two-five days | **ORD** |
| CULTURE, BODY FLUID | MICRO | Various body sites | “NO AEROBIC OR ANAEROBIC GROWTH” | #N/A | #N/A | STERILE TUBE OR STERILE SPECIMEN CUP | As  requested | Four-five days | **ORD** |
| CULTURE, TISSUE (BIOPSY) | MICRO | Various body sites | “NO AEROBIC OR ANAEROBIC GROWTH” | #N/A | #N/A | TISSUE PLACED IN STERILE SPECIMEN CUP | As  requested | Four-five days | **ORD** |
| CULTURE, BONE | MICRO | Various body sites | “NO AEROBIC OR ANAEROBIC GROWTH” | #N/A | #N/A | STERILE SPECIMEN CUP | As  requested | Four-five days | **ORD** |
| CULTURE, BONE MARROW | MICRO | Various body sites | “NO AEROBIC OR ANAEROBIC GROWTH” | #N/A | #N/A | STERILE TUBE | As  requested | Four days | **ORD** |
| CULTURE, BRONCHIAL WASHING | MICRO | BRONCHIAL  WASHING | “NO GROWTH” | #N/A | #N/A | STERILE SPECIMEN CUP OR SUCTION CUP | As  requested | Two days | **ORD** |
| CULTURE, CATH TIP | MICRO | Various body sites | “NO GROWTH” | #N/A | #N/A | STERILE SPECIMEN CUP | As  requested | Two days | **ORD** |
| CULTURE, CSF | MICRO | CEREBRAL SPINAL FLUID | “NO GROWTH” | #N/A | #N/A | CSF COLLECTION TUBES | As  requested | Four days | **ORD** |
| CULTURE, EAR | MICRO | EAR | “NO GROWTH” | #N/A | #N/A | SWAB as appropriate | As  requested | Four days | **ORD** |
| CULTURE, EYE | MICRO | EYE | “NO GROWTH” | #N/A | #N/A | SWAB as appropriate | As  requested | Four days | **ORD** |
| CULTURE, GENITAL | MICRO | GENITALIA | “SKIN FLORA” | #N/A | #N/A | SWAB as appropriate | As  requested | Four days | **ORD** |
| CULTURE, SPUTUM | MICRO | SPUTUM | “USUAL THROAT FLORA” | #N/A | #N/A | STERILE SPECIMEN CUP | As  requested | Two days | **ORD** |
| CULTURE, STOOL | MICRO | STOOL | “NO ENTERIC PATHOGENS ISOLATED” | #N/A | #N/A | STERILE SPECIMEN CUP | As  requested | Two days | **ORD** |
| CULTURE, THROAT | MICRO | THROAT | “No Group A Strep. isolated”” | #N/A | #N/A | SWAB as appropriate | As  requested | Two days | **ORD** |
| CULTURE, URINE | MICRO | URINE | “NO GROWTH” | #N/A | #N/A | STERILE SPECIMEN CUP | As  requested | Two days | **ORD** |
| CULTURE, WOUND-DEEP | MICRO | VARIOUS BODY SITES | “NO AEROBIC OR ANAEROBIC GROWTH” | #N/A | #N/A | ANAEROBIC TRANSPORT MEDIA | As  requested | Four days | **ORD** |
| CULTURE, WOUND-SUPERFICIAL | MICRO | VARIOUS BODY SITES | “NO GROWTH” | #N/A | #N/A | SWAB as appropriate | As  requested | Four days | **ORD** |
| INFLUENZA PCR | SM | NASOPHARYNGEAL SWAB OR WASHINGS, THROAT SWAB | NEGATIVE | #N/A | #N/A | UNIVERSAL TRANSPORT MEDIA | DAILY | DAILY | **ORD** |
| KOH FUNGAL PREP | MYCO | SKIN | "NEGATIVE" | #N/A | #N/A | STERILE SPECIMEN CUP | M-F | One-three days | **ORD** |
| LEGIONELLA CULTURE | MICRO | SPUTUM | “NEGATIVE” | #N/A | #N/A | STERILE  SPECIMEN  CUP | Daily | Seven days | **ORD** |
| LEGIONELLA CULTURE | MICRO | BRONCHIAL  WASHING | “NEGATIVE” | #N/A | #N/A | STERILE  SPECIMEN  CUP | Daily | Seven days | **ORD** |
| MRSA DNA DETECTION | SM | NASAL MUCUS | "NEGATIVE" | #N/A | ORDINAL | SWAB, NARES ANTERIOR | As requested | One day | **ORD** |
| MRSA NASAL CULT SCREEN | SM | NASAL MUCUS | “NEGATIVE” | #N/A | #N/A | SWAB, NARES ANTERIOR | As requested | One-two days | **ORD** |
| MYCOLOGY CULTURE | MYCO | SPUTUM | "NEGATIVE" | #N/A | #N/A | STERILE SPECIMEN CUP | Daily | Four weeks | **ORD** |
| MYCOLOGY CULTURE | MYCO | TISSUE | "NEGATIVE" | #N/A | #N/A | STERILE SPECIMEN CUP | Daily | Four weeks | **ORD** |
| MYCOLOGY CULTURE | MYCO | URINE | "NEGATIVE" | #N/A | #N/A | STERILE SPECIMEN CUP | Daily | Four weeks | **ORD** |
| MYCOLOGY CULTURE | MYCO | CSF | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Daily | Four weeks | **ORD** |
| MYCOLOGY CULTURE | MYCO | SKIN | "NEGATIVE" | #N/A | #N/A | STERILE SPECIMEN CUP | Daily | Four weeks | **ORD** |
| MYCOLOGY CULTURE | MYCO | BLOOD | "NEGATIVE" | #N/A | #N/A | BLOOD/ISOLATOR TUBE (black) | Daily | Four weeks | **ORD** |
| MYCOLOGY CULTURE | MYCO | BRONCHIAL WASHING | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Daily | Four weeks | **ORD** |
| MYCOLOGY CULTURE | MYCO | ASCITIC FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Daily | Four weeks | **ORD** |
| MYCOLOGY CULTURE | MYCO | JP DRAINAGE | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Daily | Four weeks | **ORD** |
| MYCOLOGY CULTURE | MYCO | PARACENTESIS FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Daily | Four weeks | **ORD** |
| MYCOLOGY CULTURE | MYCO | PERITONEAL FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Daily | Four weeks | **ORD** |
| MYCOLOGY CULTURE | MYCO | PLEURAL FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Daily | Four weeks | **ORD** |
| MYCOLOGY CULTURE | MYCO | SYNOVIAL FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Daily | Four weeks | **ORD** |
| MYCOLOGY CULTURE | MYCO | PERICARDIAL FLUID | "NEGATIVE" | #N/A | #N/A | FLUID TUBE | Daily | Four weeks | **ORD** |
| VAGINITIS SCREEN | SM | SWAB | "NEGATIVE" | #N/A | #N/A | Special Collection materials available from Micro x4523 | Daily | Same or Next Day | **ORD** |
| VRE SCREEN | MICRO | URINE, FECES, PERI-RECTAL SWAB | “NO VRE ISOLATED” | #N/A | #N/A | URINE CUP, FECES CUP, or SWAB (as appropriate) | Daily | Two days | **ORD** |
| C. DIFFICILE TOXIN A BY PCR | SM | FECES | “NEGATIVE” | #N/A | #N/A | STERILE SPECIMEN CUP (liquid stool required) | Daily | One day | **ORD** |
| CHLAMYDIA/NG PCR | SM | URINE | “NEGATIVE” | #N/A | #N/ | STERILE SPECIMEN CUP | Daily | One day | **ORD** |
| ENTEROVIRUS PCR | SM | CSF | “NEGATIVE” | #N/A | #N/A | FLUID TUBE | Daily | One day | **ORD** |

| **Test** | **Accession Area** | **Site/Specimen** | **Reference Lo** | **Reference Hi** | **Units** | **Specimen Collection Container** | **Routinely Performed** | **Routine Turnaround** | **Provider Orderable? (ORD: orderable, NON: results display only)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AFB CULT & SMEAR | SOCLM | ASCITIC FLUID | "No AFB isolated" | #N/A | #N/A | FLUID TUBE | DAILY | 24hrs for smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | BIOPSY | "No AFB isolated" | #N/A | #N/A | STERILE SPECIMEN CUP | DAILY | 24hrs for smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | BLOOD | "No AFB isolated" | #N/A | #N/A | BLOOD/ISOLATOR TUBE (black) | DAILY | Six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | CSF | "No AFB isolated" | #N/A | #N/A | FLUID TUBE | DAILY | 24hrs for  smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | GASTRIC CONTENTS | "No AFB isolated" | #N/A | #N/A | STERILE SPECIMEN CUP | DAILY | 24hrs for  smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | JP DRAINAGE | "No AFB isolated" | #N/A | #N/A | FLUID TUBE | DAILY | 24hrs for  smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | PARACENTESIS FLUID | "No AFB isolated" | #N/A | #N/A | FLUID TUBE | DAILY | 24hrs for  smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | PERICARDIAL FLUID | "No AFB isolated" | #N/A | #N/A | FLUID TUBE | DAILY | 24hrs for  smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | PERITONEAL FLUID | "No AFB isolated" | #N/A | #N/A | FLUID TUBE | DAILY | 24hrs for  smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | SKIN | "No AFB isolated" | #N/A | #N/A | STERILE SPECIMEN CUP | DAILY | 24hrs for  smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | SYNOVIAL FLUID | "No AFB isolated" | #N/A | #N/A | FLUID TUBE | DAILY | 24hrs for  smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | TISSUE | "No AFB isolated" | #N/A | #N/A | STERILE SPECIMEN CUP | DAILY | 24hrs for  smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | URINE | "No AFB isolated" | #N/A | #N/A | STERILE SPECIMEN CUP | DAILY | 24hrs for  smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | WOUND | "No AFB isolated" | #N/A | #N/A | STERILE SWAB | DAILY | 24hrs for  smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | BRONCHIAL WASHING | "No AFB isolated" | #N/A | #N/A | STERILE SPECIMEN CUP | DAILY | 24hrs for  smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | BRONCHOALVEOLAR LAV PROTECTED | "No AFB isolated" | #N/A | #N/A | STERILE SPECIMEN CUP | DAILY | 24hrs for  smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | PLEURAL FLUID | "No AFB isolated" | #N/A | #N/A | FLUID TUBE | DAILY | 24hrs for  smear, six weeks for cult | **ORD** |
| AFB CULT & SMEAR | SOCLM | SPUTUM | "No AFB isolated" | #N/A | #N/A | STERILE SPECIMEN CUP | DAILY | 24hrs for  smear, six weeks for cult | **ORD** |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
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| OVA & PARASITE EXAM/GIARDIA | SOCL | FECES | "None Seen" | #N/A | #N/A | STERILE SPECIMEN CUP | Daily | One-three days | **ORD** |
| OVA & PARASITE EXAM | SOCL | SPUTUM | "None Seen" | #N/A | #N/A | STERILE SPECIMEN CUP | Daily | One-three days | **ORD** |
| CRYPTOSPORIDIUM SMEAR | SOCL | FECES | "None Seen" | #N/A | #N/A | STERILE SPECIMEN CUP | Daily | One-three days | **ORD** |
| MICROSPORIDIUM SMEAR | SOCL | FECES | "None Seen" | #N/A | #N/A | STERILE SPECIMEN CUP | Daily | One-three days | **ORD** |
| ISOSPORA SMEAR | SOCL | FECES | “None Seen” | #N/A | #N/A | STERILE SPECIMEN CUP | Daily | One-three days | **ORD** |
| CYCLOSPORA SMEAR | SOCL | FECES | “None Seen” | #N/A | #N/A | STERILE SPECIMEN CUP | Daily | One-three days | **ORD** |

| **Test** | **Accession Area** | **Site/Specimen** | **Reference Lo** | **Reference Hi** | **Units** | **Specimen Collection Container** | **Routinely Performed** | **Routine Turnaround** | **Provider Orderable? (ORD: orderable, NON: results display only)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ACT. CLOTTING TIME | ANC | BLOOD | 105 | 167 | Seconds | #N/A (POCT) | POC | #N/A | NON |
| BEecf (istat) | ANC | BLOOD | -2 | 2 | mmol/L | #N/A (POCT) | POC | #N/A | NON |
| BILIRUBIN Ur (POC) | ANC | URINE | "neg" | #N/A | #N/A | #N/A (POCT) | POC | #N/A | NON |
| BLOOD Ur (POC) | ANC | URINE | "neg" | #N/A | #N/A | #N/A (POCT) | POC | #N/A | NON |
| GLU (istat) | ANC | BLOOD | 65 | 110 | mg/dL | #N/A (POCT) | POC | #N/A | NON |
| GLUCOSE Ur (POC) | ANC | URINE | "neg" | #N/A | MG/DL | #N/A (POCT) | POC | #N/A | NON |
| GLUCOSE-HAND MONITOR | ANC | CAPILLARY | 60 | 130 | mg/dl | #N/A (POCT) | POC | #N/A | NON |
| HCO3 (istat) | ANC | BLOOD | 21 | 29 | mmol/L | #N/A (POCT) | POC | #N/A | NON |
| HCT (istat) | ANC | BLOOD | MALE-42 FEMALE-37 | MALE-52 FEMALE-47 | %PCV | #N/A (POCT) | POC | #N/A | NON |
| HGB (istat) | ANC | BLOOD | MALE-14 FEMALE-12 | MALE-18 FEMALE-16 | g/dL | #N/A (POCT) | POC | #N/A | NON |
| iCA (istat) | ANC | BLOOD | 1.06 | 1.26 | mmol/L | #N/A (POCT) | POC | #N/A | NON |
| K (istat) | ANC | BLOOD | 3.5 | 5.0 | mmol/L | #N/A (POCT) | POC | #N/A | NON |
| KETONES Ur (POC) | ANC | URINE | "neg" | #N/A | mg/dl | #N/A (POCT) | POC | #N/A | NON |
| LEUKOCYTES Ur (POC) | ANC | URINE | "neg" | #N/A | #N/A | #N/A (POCT) | POC | #N/A | NON |
| NA (istat) | ANC | BLOOD | 135 | 145 | mmol/L | #N/A (POCT) | POC | #N/A | NON |
| NITRITE Ur (POC) | ANC | URINE | "neg" | #N/A | #N/A | #N/A (POCT) | POC | #N/A | NON |
| O2SAT (istat) | ANC | BLOOD | 92 | 96 | % | #N/A (POCT) | POC | #N/A | NON |
| PCO2 (istat) | ANC | BLOOD | 32 | 46 | mmHg | #N/A (POCT) | POC | #N/A | NON |
| PH (istat) | ANC | BLOOD | 7.38 | 7.46 | #N/A | #N/A (POCT) | POC | #N/A | NON |
| PH Ur (POC) | ANC | URINE | 4.5 | 8.0 | #N/A | #N/A (POCT) | POC | #N/A | NON |
| PO2 (istat) | ANC | BLOOD | 74 | 108 | mmHg | #N/A (POCT) | POC | #N/A | NON |
| POC BLOOD GAS PANEL (PH, PCO2, BEecf, HCO3, TCO2, O2 SAT, NA, K, iCA, GLU, HCT, HGB, PT. TEMP) | ANC | BLOOD | #N/A | #N/A | #N/A | #N/A (POCT) | POC | #N/A | NON |
| POC CREATININE | ANC | BLOOD | 0.5 | 1.5 | mg/dL | #N/A (POCT) | POC | #N/A | NON |
| POC INTERNAT. NORMALIZED RATIO | ANC | CAPILLARY | #N/A | #N/A | #N/A | #N/A (POCT) | POC | #N/A | NON |
| POC URINALYSIS | ANC | URINE | #N/A | #N/A | #N/A | #N/A (POCT) | POC | #N/A | NON |
| PROTEIN Ur (POC) | ANC | URINE | "neg" | #N/A | #N/A | #N/A (POCT) | POC | #N/A | NON |
| Specific Gravity Ur (POC) | ANC | URINE | 1.005 | 1.030 | #N/A | #N/A (POCT) | POC | #N/A | NON |
| TCO2 (istat) | ANC | BLOOD | 24 | 29 | mmol/L | #N/A (POCT) | POC | #N/A | NON |
| UROBILINOGEN Ur (POC) | ANC | URINE | 0.1 | 1.0 | E.U./dl | #N/A (POCT) | POC | #N/A | NON |

11-DEOXYCORTISOL

17-ALPHA-HYDROXYPROGESTERONE

17-KETOGENIC STEROIDS, 24H UR

17-KETOSTEROIDS, 24HR URINE

18 HYDROXYCORTICOSTERONE

3-METHOXY-4-HYDROXYPHEN

5' NUCLEOTIDASE

5-HIAA (24HR URINE)

5-HIAA QN (RANDOM URINE)

ACHR BINDING ABS

ACHR BLOCKING ABS

ADENOSINE DEAMINASE, PERITONEAL FLD

ADENOVIRUS TOTAL AB

ADRENAL CORTICOTROPHIC HORMONE ASSAY

AFP, SERUM, TUMOR MARKER

AFP-MATERNAL SERUM

ALCOHOL PROFILE

ALDOLASE

ALDOSTERONE (24h UR)

ALDOSTERONE (SERUM)

ALK PHOS (BONE SPECIFIC)

ALK PHOS ISOENZYMES

ALLERGEN PROFILE (IGE) FOOD BASIC

ALLERGEN PROFILE, NUTS

ALLERGENS, MIA

ALPHA 2 ANTIPLASMIN

ALPHA-1-ANTITRYPSIN TOT & PHEN

ALPHA-FETOPROTEIN, FLUID

ALPHA-GAL PANEL

ALPHA-PGH

ALUMINUM (BLOOD)

ALUMINUM (URINE)

AMIKACIN

AMINOLEVULINIC ACID

AMIODARONE & METABOLITE

AMITRIPTYLINE (plus NORTRIPTYLINE)

AMOBARBITAL, SERUM

AMOEBIC ANTIBODIES

AMPHETAMINE, SCREEN AND CONF, URINE

AMYLASE ISOENZYMES

ANDROSTANE-DIOL GLU.

ANDROSTENEDIONE

ANGIOTENSIN-1-CONVERTING ENZ (CSF)

ANGIOTENSIN-1-CONVERTING ENZ (SERUM)

ANTIADRENAL ANTIBODIES

ANTIDIURETIC HORMONE PROFILE

ANTI-DNA (SINGLE STRAND)

ANTIGLIADIN IgG & IgA

ANTI-HISTONE AB

ANTI-HYALURONIDASE

ANTIMYOCARDIAL ANTIBODIES, QN

ANTI-NEUTROPHIL CYTOPLASMIC AB

ANTISTREPTOLYSIN O AB

ANTI-STRIATED MUSCLE ANTIBODY

ANTITHROMBIN III (FUNC/IMMUNOL)

APO A1 + B + RATIO

ARSENIC (BLOOD)

ARTHROPOD ID

ASPERGILLUS FUMIGATUS IGE

ATIVAN

B PERTUSSIS IGG AB, QUANT

B PERTUSSIS IGM AB, QUANT

B-2 GLYCOPROTEIN 1 AB, IGG, IGA, IGM

BABESIA MICROTI ANTIBODIES

BARBITURATES SCR&CONFIRM, URINE

BARTONELLA AB PANEL

BATH SALTS PANEL

BENZODIAZEPINES CONFIRMATION, UR

BERYLLIUM

BETA-2-MICROGLOBULIN

BETA-HCG, CSF (TUMOR)

BETAHYDROXYBUTYRATE

BRUCELLA IgG ANTIBODIES

BRUCELLA IgM ANTIBODIES

BUPRENORPHINE, URINE

C1 ESTER INH, FUNC

C1 ESTER INH, SERUM

C1Q IMMUNE COMPLEX

CA-125

CADMIUM, BLOOD

CADMIUM, URINE

CAFFEINE

CALCITONIN, SERUM

CALCITRIOL

CANCER ANTIGEN 15-3

CANDIDA ANTIBODY-QUAL

CANNABINOID CONFIRM. Ur

CARBOHYDRATE ANTIGEN 19-9

CARDIOLIPIN AB PANEL

CARNITINE

CAROTENE

CATECHOLAMINES (24HR URINE)

CATECHOLAMINES (PLASMA)

CATECHOLAMINES (RANDOM URINE)

CCP IgG/IgA

CD4/CD8 RATIO PROFILE

CEA (BLOOD)

CEA (FLUID)

CELIAC DISEASE AB COMPREHENSIVE

CERULOPLASMIN

CHLAMYDIA IGG ANTIBODY

CHLAMYDIA TRACHOMATIS AB, IGM, QUANT

CHLAMYDIA TRACHOMATIS CULTURE

CHLORAMPHENICOL

CHLORDIAZEPOXIDE PANEL

CHLORIDE STOOL RANDOM

CHLORPHENIRAMINE

CHLORPROMAZINE (SERUM)

CHOLINESTERASE

CHROMIUM

CHROMIUM, URINE

CHROMOGRANIN A

CIMETIDINE

CITRIC ACID (CITRATE), URINE

CK ISOENZYMES (LABCORP)

CLOMIPRAMINE PANEL

CLONAZEPAM

CLOZAPINE, Serum

CMV AB IgG, CSF (LABCORP)

CMV CULTURE (LC)

COBALT, PLASMA

COENZYME Q10

COMPLEMENT C2

COMPLEMENT C3

COMPLEMENT C4

COMPLEMENT CH50

COMPLEMENT COMPONENT C1Q

COPPER, URINE

COPPER, WHOLE BLOOD

CORTISOL, URINARY FREE

COXSACKIE B VIRUS GROUP AB

C-PEPTIDE

CRYOFIBRINOGEN

CRYOGLOBULINS

CRYPTOSPORIDIUM EIA (LABCORP)

CYANIDE SCREEN, BLOOD

CYCLIC AMP

CYCLIC AMP, URINE

CYCLOSPORINE, BY IA (LC)

CYSTINE, QUANTITATIVE, URINE (panel)

DEXAMETHASONE, SERUM

DHEA, SERUM

DHEA-SULFATE

DIAZEPAM & METAB

DIBUCAINE NUMBER

DIGITOXIN

DIHYDROTESTOSTERONE

DIPHENHYDRAMINE

DIPHTHERIA ANTIBODIES

DISOPYRAMIDE

DOXEPIN (plus NORDOXEPIN)

DRUG SCREEN($25 PAIN MGMT) SEND OUT

DRUG SCREEN(PAIN MGMT)+FENTANYL

DRUG SCREEN, SERUM

ENTAMOEBA HISTOLYTICA AG, EIA

ERYTHROPOIETIN

ESTRADIOL (17-B)

ESTRIOL (UNCONJUGATED/FREE)

ESTROGEN (TOTAL)

ESTRONE

ETHOSUXIMIDE

ETHYLENE GLYCOL

EUGLOBULIN LYSIS TIME

FACTOR V ACTIVITY (%)

FAT & MUSCLE FIBERS, FECES, QUALITATIVE

FAT, QUALITATIVE

FATTY ACIDS (FREE)

FECAL FAT QUANT (72 HR)

FENTANYL, URINE SCREEN & CONFIRMATION

FLECAINIDE

FLUORIDE

FLUOROCYTOSINE LEVEL

FLUOXETINE & METAB.

FLUPHENAZINE-PROLIXIN

FORMIC ACID

FREE DILANTIN

FREE HGB, PLASMA

FREE KAPPA/LAMBDA LT CHAINS, Ur

FREE T3

FREE TESTOSTERONE PROFILE

FREE VALPROIC ACID

FRUCTOSAMINE

FSH

FSH/LH

G-6-PD,QUANT,BLOOD & RBC

GABAPENTIN

GAD-65 AUTOANTIBODY

GALLSTONE ANALYSIS

GASTRIN

GLOMERULAR BM AB, Qn

GLUCAGON

GLUTETHIMIDE

GQ1B IGG AB, ELISA

GROWTH HORMONE

HALOPERIDOL

HAPTOGLOBIN

HBV DNA PROBE (ngi superquant)

HCG, SERUM (LABCORP)

HEAVY METALS (BLOOD-QUAN)

HEAVY METALS (URINE-QUAN)

HEINZ BODIES

HELICOBACTER PYLORI ANTIGEN (STOOL)

HEMOCHROMATOSIS

HEPARIN INDUCED ANTIBODY W/REFLEX TO SRA

HEPATITIS Be ANTIBODY

HEPATITIS Be ANTIGEN

HGB ELECTROPHORESIS

HGB SOLUBILITY + REFLEX FRAC PANEL

HIGH SENSITIVITY CRP (LABCORP)

HISTOPLASMA AG, URINE

HIV RNA, EXTENDED RANGE QUANT

HLA B 27 DISEASE ASSOC.

HLA B\*5701

HOMOCYSTEINE

HOMOGENTISTIC ACID

HOMOVANILLAC ACID

HORSE EPITHELIA/DANDER IgG E003

HOUSE DUST (HOLLISTER) H002

HSV TYPE 1/2, IGM, BLOOD

HTLV-I/HTLV-II QUAL

HTLV-I/II AB, ELISA, CSF

HYDROXYPROLINE-TOTAL

IFE (SERUM)

IFE (URINE)

IGG SUBCLASS 4

IGG SUBCLASSES PANEL

IGG SYNTHESIS RATE AND INDEX

IMIPRAMINE & DESIPRAMINE

IMMUNE COMPLEXES PROFILE

IMMUNOGLOBULIN D

IMMUNOGLOBULIN E

IMMUNOGLOBULINS QUANT (SERUM)

INFLAMMATORY BOWEL DISEASE PROFILE

INSULIN

INSULIN ANTIBODIES

INSULIN TOLERANCE

INSULIN-LIKE GROWTH FACTOR I

INSULIN-LIKE GROWTH FACTOR II

INTRINSIC FACTOR AB

IODINE, 24 HOUR URINE

IODINE, RANDOM URINE

IRON (URINE 24Hr)

ISOSPORA & CYCLOSPORA SMEAR (LABCORP)

KAPPA + LAMBDA Lt CHAINS, FREE, Serum

LACTOSE TOLERANCE (2 HR)

LAMOTRIGINE

LEAD (BLOOD)

LEAD (URINE)

LEUKOCYTE ALKALINE PHOS SCORE

LEVETIRACETAM

LIDOCAINE

LIPOPROTEIN (a)

LSD, URINE

LUPUS ANTICOAGULANT (LABCORP)

LUTEINIZING HORMONE

LYME, WESTERN BLOT, CSF

MALARIA SMEAR (LABCORP)

MANGANESE

MANGANESE (URINE)

MDMA

MELANIN

MEPERIDINE, URINE

MEPROBAMATE

MERCURY (BLOOD)

MESORIDAZINE

METANEPHRINES (URINE)

METANEPHRINES, PHEOCHROMOCYT EVAL

METHADONE (SERUM)

METHADONE SCREEN (URINE)

METHAQUALONE

METHOTREXATE

METHSUXIMIDE

METHYLMALONIC ACID (SERUM)

METHYLMALONIC ACID, URINE (panel)

METHYLPHENIDATE, SERUM

METHYPRYLON

MEXILETINE

MICROSPORIDIA STAIN (LABCORP)

MIXING STUDY, PT (LABCORP)

MIXING STUDY, PTT (LABCORP)

MONONUCLEOSIS TEST, QUAL

MTHFR DNA TESTING

MULTIPLE SCLEROSIS (MS) PROFILE

MURAMIDASE

MUSHROOM (F212) IGE

MYASTHEMIA GRAVIS EVALUATION

MYCOPHENOLIC ACID & METAB.

MYELIN BASIC PROTEIN, CSF

MYELOPEROXIDASE AB

MYOGLOBIN (SERUM)

NEFAZODONE

NEURON SPECIFIC ENOLASE, CSF

NEURON SPECIFIC ENOLASE, SERUM

NICOTINE & METABOLITE, SERUM

NICOTINE MET., URINE (COTININE)

NORTRIPTYLINE

N-TELOPEPTIDE PANEL

OLIGOCLONAL BANDS EP

ONIONS,(F048) IgE

OPIATES CONFIRMATION, URINE

OSMOLALITY, FECES

OSTEOCALCIN

OVA AND PARASITE EXAM, GIARDIA (LC)

OXALATES, QUANT, 24Hr UR

OXCARBAZEPINE

OXYCODONE & METABOLITE, SERUM

PARAINFLUENZAE 1-3 VIRUS AB

PARVOVIRUS B19 AB(IGM)

PAXIL

PENTOBARBITAL, SERUM

PH (STOOL)

PHENCYCLIDINE, Ur

PHENOBARBITAL (LABCORP)

PHENOLPHTHALEIN (FECES)

PHENOTHIAZINE

PHOSPHOLIPIDS

PLACIDYL

PLASMINOGEN ACTIVITY

PLATELET ANTIBODY, Serum

PORPHOBILINOGEN

PORPHOBILINOGEN, QUANT, UR random

PORPHYRINS (URINE)

PORPHYRINS, SERUM (TOTAL)

POTASSIUM STOOL RANDOM

POTATO, SWEET (F054) IgE

POTATO, WHITE (F035) IgE

PRIMIDONE/PHENOBARBITAL

PROCAINAMIDE/NAPA (lc)

PROGESTERONE

PROINSULIN

PROLACTIN

PROPAFENONE

PROPRANOLOL

PROSTATIC ACID PHOSPHATASE, SERUM

PROTAMINE IgE

PROTEIN C ANTIGEN

PROTEIN C FUNCTIONAL

PROTEIN ELECTROPHORESIS

PROTEIN ELECTROPHORESIS (CSF)

PROTEIN S PROFILE (LC)

PROTEINASE 3 ANTIBODY

PROTOPORPHYRIN, FEP/ZPP

PSA FREE:TOTAL RATIO

PTH RELATED PEPTIDE

Q FEVER IGG

QUANTIFERON TB GOLD PANEL

QUANTITATIVE IMMUNOGLOBULINS (CSF)

QUETIAPINE

QUINIDINE

RABIES NEUT. ABS TITRAT. (RFFIT)

RAST ALLERGEN MINI- PROFILE

RAST ALLERGENS (ZONE 8) Specific IgE

RAST LATEX ALLERGEN

RBC CHOLINESTERASE

RBC FOLATE

RENIN, Plasma

RESPIRATORY SYNCYTIAL VIRUS TITER

RETINOL BINDING PROTEIN

RICE (F009) IgE

RISPERIDONE+METAB

ROBAXIN

ROCKY MTN SPOTTED FEV, IGG, QN

ROTAVIRUS ANTIGEN

SACCHAROMYCES CEREVISIAE AB PANEL

SALIVARY CORTISOL, MS

SECOBARBITAL, SERUM

SELENIUM (LABCORP)

SEROTONIN (BLOOD)

SEROTONIN (SERUM)

SEX HORMONE BINDING GLOBULIN

SHELLFISH ALLERGEN PROFILE (LABCORP)

SIROLIMUS

SKIN AUTOANTIBODIES, QUANT

SODIUM STOOL RANDOM

SPINACH (F214) IGE

STRONGYLOIDES IGG AB

SULFATE, QUANT,24-HOUR URINE

SYNOVASURE PJI ONLY

SYNTHETIC CANNABINOID METABOLITES

TACROLIMUS

TEICHOIC ACID AB

TETANUS AB PROFILE

THALLIUM (URINE)

THIOCYANATE

THIOPENTAL

THIORIDAZINE

THYROID (MICROSOMAL) AB

THYROID STIMULATING IMMUNOGLOBIN

THYROTROPIN RECEPTOR AB, Serum

THYROXINE BINDING GLOBULIN

TISSUE THROMBOPLASTIN INHIBITION TEST

TOLUENE, BLOOD

TOMATO (F025) IGE

TOPIRAMATE

TOXOCARA ANTIBODIES

TRAMADOL SCREEN & CONF (URINE)

TRANSFERRIN

TRANSGLUTAMINASE, TISSUE IGA

TRAZODONE

TRICHINELLA ANTIBODIES

TRYPANOSOMA CRUZI AB, IGG

TRYPANOSOMA CRUZI AB, IGM

TRYPSIN

TYPHUS, MURINE IGG ANTIBODY-IFA

VARICELLA ZOSTER CULTURE (LC)

VASO ACTIVE PEPTIDE

VDRL (CSF)

VENLAFAXINE

VENOM (INSECT) ALLERGENS PANEL

VIRAL CULTURE (GENERAL)

VISCOSITY

VISTARIL

VITAMIN A

VITAMIN B 6

VITAMIN B1, WHOLE BLOOD

VITAMIN B-12 BINDING CAPACITY

VITAMIN C

VITAMIN E PROFILE

VMA, 24hr U

VON WILLEBRAND'S FACTOR MULTIMER

VZV, RAPID VIRAL CULTURE

WARFARIN ASSAY (as sodium warfarin)

WEST NILE VIRUS AB (serum)

XANAX

XYLOSE ABSORPTION

YEAST, BAKER'S (F045) IgE

YEAST, BREWER'S (F155) IgE

ZINC (URINE)

ZINC, PLASMA

ZIPRASIDONE

ZONISAMIDE, SERUMVITAMIN E PROFILE

VMA, 24hr U

VON WILLEBRAND'S FACTOR MULTIMER

VZV, RAPID VIRAL CULTURE

WARFARIN ASSAY (as sodium warfarin)

WEST NILE VIRUS AB (serum)

XANAX

XYLOSE ABSORPTION

YEAST, BAKER'S (F045) IgE

YEAST, BREWER'S (F155) IgE

ZINC (URINE)

ZINC, PLASMA

ZIPRASIDONE

ZONISAMIDE, SERUM

ACETYLCHOLINE REC. AB. MODUL

ACID HEMOLYSIN

ADALIMUMAB & AB

ADENOSINE DEAMINASE, CSF

ADENOSINE DEAMINASE, PERICARDIAL FLD

ADENOSINE DEAMINASE, PLEURAL FL

ALLOPURINOL

ALPHA-1-ANTITRYPSIN, STOOL

ALPHA-2-MACROGLOBULIN

ALPHA-GALACTOSIDASE A DEFICIENCY

ALS/DEMENTIA NEXT SEQUENCING PANEL

AMANTADINE

AMINO ACID PROFILE, Qn, (24hr URINE)

AMINO ACIDS, GLYCINE, PL+CSF

AMOXAPINE

ANTABUSE

ANTI-EPIDERMAL AB

ANTI-HMGCR AUTOANTIBODIES

ANTI-MOUSE ANTIBODY

APOLIPOPROTEIN E

ARBOVIRUS AB IGG, CSF

ARBOVIRUS AB IGM, CSF

ARSENIC (HAIR)

ASPERGILLUS GALACTOMANNAN AG, BAL/SERUM

B. PERTUSSIS, B. PARAPERTUSIS DNA PCR

BACLOFEN

BCL2-IGH GENE REARRANGEMENTS

BCR - ABL1 PCR QUANT CML/ALL

BCR-ABL1 KINASE MUTATION ANL

BETA 2 TRANSFERRIN (fld+blood)

BIOTIN/VIT B7

BKV DNA PCR

BLASTOMYCES ANTIGEN

BRAF MUTATION ASSAY, MELANOMA

BRCA 1/2 (GENEDX)

BRCA ASSURE COMPREHENSIVE TEST (LABCORP)

BRCA, TARGETED ANALYSIS (LABCORP)

BRETYLIUM

BROMIDE

BROMOCRIPTINE

BULLOUS PEMPHIGOID 180 AND 230

BUPRENORPHINE, SERUM

BUSPAR

C. JEJUNI AB

C9 OR F72 DNA TEST

CALPROTECTIN, FECAL

CALR MUTATION ANALYSIS

CARBOHYDRATE DEFICIENT TRANSFERRIN

CATHARTIC LAXATIVES PROFILE

CEFTAZIDIME

CELIAC DISEASE HLA DQ ASSOC.

CELL MARKERS, LEUKEMIC(LC)

CHLAMYDIA PNEUMONIAE AB PANEL

CHLAMYDIA PNEUMONIAE BY PCR

CHROMOSOME, LEUKEMIA/LYMPHOMA

CHYLOMICRON SCREEN, BODY FLUID

CLOPIDOGREL 2C19 GENO

CMT-TYPE 1A

CMV PCR, OCULAR FLUID

CMV PCR, QUALITATIVE

COLARIS, SINGLE SITE ANALYSIS

COMPLEMENT C3a

COXSACKIE A AB PANEL, CSF

COXSACKIE A VIRUS (2,4,7,9,10,16) AB

COXSACKIE B AB PANEL, CSF

CREUTZFELDT-JAKOB DISEASE

C-TELOPEPTIDE, SERUM

CYSTIC FIBROSIS DNA PROBE

CYTOCHROME (WARFARIN P450 2C9 & VKORC1)

CYTOCHROME P450 2C19

CYTOMEGALOVIRUS QUANT PCR, PLASMA

DEOXYCORTICOSTERONE

DHEA, URINE

DIOXIN

D-LACTATE

DPD 5-FLUOROURACIL TOXICITY

DRUG-DEPEND PLATELET AB

EAR, INNER, 68KD AB

ECHINOCOCCUS AB

ECHOVIRUS ANTIBODIES

EDDP CONFIRM, URINE

EHRLICHIA AB PANEL

EHRLICHIA DETECTION BY PCR

ENCAINIDE

EPSTEIN-BARR VIRUS PCR (CSF)

ESTROGENS (FRACTIONATED)

ETHAMBUTOL

FACTOR II & FACTOR V MUTATION PROFILE

FACTOR Xa, CHROMOGENIC

FAP MUTATION SCREEN

FATTY ACID PROFILE (PER. C22-C26)

FEBRILE AGGLUTININS

FECAL ANALYSIS (NA, K, CL)

FILARIA IGG4 ANTIBODIES

FLT3 INTERNAL TANDEM DUP(ITD) PCR

FOOD ALLERGENS-IGG

FRANCISELLA TULARENSIS IGG & IGM AB

FSHD DNA DELETION

FT4 BY EQUILIBRIUM DIALYSIS/MASS SPEC

FUNGITELL B-D GLUCAN

FUROSEMIDE

FUS DNA SEQUENCING

GALOP AUTOANTIBODY

GAMMA HYDROXYBUTYRATE SCREEN

GAUCHER DISEASE DNA ANALYSIS

GLYCOSAMINOGLYCANS, UR

HCV FIBROSURE

HEPATITIS D VIRUS (HDV) TOTAL

HEPATITIS D VIRUS IGM AB, EIA

HHT TESTING W/REFLEX TO SMAD4 SEQUENCING

HISTAMINE

HISTOPLASMA AG, CSF

HISTOPLASMA AG, SERUM

HIV GENOSURE MG

HIV GENOSURE PRIME (INCLUDES INTEGRASE)

HSV 1/2 PCR, NON-CSF

HUMAN ANTI-CHIMERIC AB (HACA)

HUMAN HERPESVIRUS 6 (HHV-6), DNA PCR

HUNTINGTON'S TEST

HYDROCHLOROTHIAZIDE

IGA DEFICIENCY PANEL

IL28B POLYMORPHISM GENOTYPE

INFLIXIMAB PANEL (LC)

INTERFERON

INTERFERON NEUTRALIZING AB

INTERLEUKIN 10, VITREOUS FLUID- MAYO

INTERLEUKIN 6, VITREOUS FLUID-MAYO

INTERLEUKIN-6

IRINOTECAN TOXICITY

ISONIAZID

ITRACONAZOLE

JAK2 MUT. DETECT (ONLY)

JAK2, REFLEX TO CALR/MPL/E2

JCV DNA PCR

KANAMYCIN

KIDNEY STONE RISK INDICATOR PROFILE

KRATOM, SCREEN & CONF

LACTOFERRIN, STOOL

LEGIONELLA SPECIES, PCR

LEISHMANIA ANTIBODY, IGG

LEPTOSPIRA IGM AB

LOXAPINE

LSD, SERUM

LYMPHOCYTE MITOGEN & ANTIGEN STIMULATION

M TUBERCULOSIS DETECTION DNA, PCR

MALARIA ANTIBODY, IGG

MAPROTILINE

MARFAN SYNDROME (FBN1)

MERCAPTOPURINE

METANEPHRINES (PLASMA)

METOPROLOL

MITOTANE

MORPHINE FREE

MORPHINE TOTAL QUANT

MOTOR AND SENSORY NEUROPATHY PANEL

MULTIPLE ENDOCRINE NEOPLASIA, TYPE 1

MULTIPLE ENDOCRINE NEOPLASIA, TYPE 2

MUSK ANTIBODY TITER

MYELIN ASSOC GLYCOPROTEIN IGM AB

MYH GENE ANALYSIS

MYOSITIS ANTIBODY PROFILE

NARCOLEPSY EVALUATION

NEUROFIBRO TYPE 1-FISH

NEUROFIBROMATOSIS, TYPE 2 MUTATION

NEUROKININ A

NEUROMYELITIS OPTICAL IGG AUTOANTIBODIES

NEUROPATHY PROFILE II

NEUTROPHIL AB SCREEN

NIFEDIPINE

NMDA RECEPTOR ANTIBODY

NORVIRUS DETECT RLTPCR

N-TELOPEPTIDE, SERUM

OLANZAPINE

ONCOLOGY FISH

OPIATES, UNCONJUGATED EXP. (BLOOD)

OXALATE, SERUM

OXAZEPAM

PANCREASTATIN

PANCREATIC ELASTASE, FECAL

PANCREATIC POLYPEPTIDE

PANCREATITIS, PRSS1

PARALDEHYDE & METABOLITE

PARANEOPLASTIC AUTOAB-MAYO (APPROV Req)

PARANEOPLASTIC SYND PROFILE

PARVOVIRUS B19 DNA BY PCR (Qual)

PDGFRB

PERPHENAZINE

PIMOZIDE

PLATELET AUTOAB PANEL

PNEUMOCOCCAL IM (14 SEROTYPE)

POLIOVIRUS IMMUNE STATUS

PORPHYRINS (FECES)

PROPREDICTOR 6 METABOLITES

PYRAZINAMIDE

PYRUVATE KINASE

Q FEVER (COXIELLA BUR) IGG/M 1&2

RESP VIRUS PANEL (RVP), PCR

REVERSE T-3

RICKETTSIA RICKETTSII DNA, PCR

RIFAMPIN

SERTRALINE

SOD-1 GENE MUT ANALYSIS (FALS)

SOLUBLE LIVER ANTIGEN (IGG AB)

SOLUBLE TRANSFERRIN RECEPTOR

SOTALOL

SQUAMOUS CELL CARCINOMA

STREPTOMYCIN ASSAY

SULFATIDE AUTOANTIBODY

T & B CELL GENE REARRANGEMENT, SB

T&B LYMPHOCYTE/NAT KILLER CELL PROFILE

TARDBP DNA SEQUENCING

TAU PROTEIN

T-CELL GENE REARRANGEMENT, PCR

TESTOSTERONE, 24 HOUR URINE

THIOTHIXENE

TOCAINIDE

TOXOPLASMA GONDII DNA PCR

TPMT ERYTHROCYTES

TPMT MUTATION ANALYSIS

TREPONEMA PALLIDUM DNA, QUAL PCR

TRIFLUOPERAZINE

TROPHERYMA WHIPPLEI, PCR-BLOOD

TRYPTASE

TYPHUS FEVER GROUP IGG & IGM

UNSTABLE HEMOGLOBIN

UR DRUG SCREEN, COMPREHENSIVE ($150)

URANIUM, URINE

VERAPAMIL

VGCC AB

VITAMIN B-3 (NIACIN + METABOLITE)

VITAMIN K

VON WILLEBRAND PROFILE

VORICONAZOLE

VZV REAL TIME PCR

WEST NILE VIRUS AB (csf)

|  |
| --- |
| THROMBIN CLOTTING TIME |
| RISTOCETIN COFACTOR |
| SWEAT CHLORIDE (SOUK) |
| CORYNEBACTERIUM DIPTHERIAE CULTURE |
| FACTOR IX |
| FACTOR X |
| FACTOR XII |
| FACTOR XIII |
| FACTOR V INHIBITOR |
| FACTOR VIII INHIBITOR |
| HEPARIN (QUANT) |
| HEPARIN, LOW MOLECULAR WEIGHT |
| FACTOR II ASSAYS |
| FACTOR XI |
| THYROGLOB. PANEL\*\*DATE SENSITIVE\*\* |
| THYROGLOBULIN PANEL (UK) |
| FACTOR VII ASSAYS |
| FACTOR VIII ASSAYS |
| PLT FUNCTION ANAL. |
| CD55/CD59 FLOW CYTOMETRY ASSAY |
| HSV 1/2 PCR, CSF |
| HLA-DR |
| CHRONIC DEMYELIN NEURO PF |