Pathology and Laboratory Medicine Service (P&LMS)

LAB MANUAL

VA North Texas Health Care System

Paper Copies are not Document Controlled

rev September 2022

Shelby D. Melton, MD
Chief, P&LMS

TABLE OF CONTENTS **PAGE**

GENERAL LABORATORY INFORMATION:

1. P&LMS Telephone Listings 3
2. Guidelines for Laboratory Use....6
3. Specimen Collection and Labeling 9
4. Specimen Delivery....11
5. Sample Acceptability/Rejection Criteria 13
6. Reporting of Results 15
7. Accessing Test Results in Computer (CPRS) 17
8. Computer Downtime Protocol 18
9. Lab Test Downtime Menu 21
10. Medical Emergency Test List 22
11. Laboratory Critical Values, Alert Values 23
12. Laboratory Alert Values 25
13. Reference Laboratory 26
14. CSF and Other Sterile Body Fluids 27
15. Alphabetized List of Tests, "Yellow Pages"....29
16. Table of Reflexed Tests in VANTHCS 67
17. Quick Guide for Ordering Antibiotic Levels 68

LABORATORY SECTIONS:

Ancillary Testing (Waived Testing, Point-of-Care)....69
Autopsy 75
Blood Bank (Transfusion Medicine)....78
Core Lab – Chemistry (Includes Urinalysis)....89
Core Lab – Hematology (Includes Coagulation) 93
Cytopathology 96
Flow Cytometry (Immunophenotyping) 99
Immunology....101
Molecular Diagnostics (Viral Load & Genotyping)....105
Microbiology (Includes Mycology/Mycobacteriology)....111
Outpatient Phlebotomy/Ancillary Support Services 133
Inpatient Phlebotomy/Ancillary Support Services 138
STAT Lab – Operating Rooms 139
Surgical Pathology 141
Toxicology 145

OTHER SITES:

Arterial Blood Gas Labs 149
Fort Worth Outpatient Clinic 150
Sam Rayburn Memorial Veterans Center 153

Paper Copies are not Document Controlled

PATHOLOGY AND LABORATORY MEDICINE SERVICE TELEPHONE LISTINGS

FREQUENTLY NEEDED NUMBERS:

Patient Sample Requirements or Questions (Client Services Unit) 70666/70714
Inpatient Phlebotomy 70736
Blood Bank (Transfusion Medicine)..... 70720
Pathology reports (Autopsy, Biopsy, Cytology) 70677/70668
Pathology Resident on Call -- pager
(Fine Needle Aspirates, Frozen Sections, etc.) 214-759-3341

ADMINISTRATIVE OFFICE

Chief, Pathology & Laboratory Medicine Service
Shelby D. Melton, M.D 70684
Administrative Officer
Nathan Irigoyen 70729
Secretary to Chief
Keleigh Garland..... 70684
Supervisory Management Assistant
Andreanna Taylor 70684/70692
Laboratory Manager
Brian Ivey, MHA, MT(ASCP) 70682
Assistant Laboratory Manager/Education Coordinator
William Scott, MS, MLS(ASCP)^{cm}.....73369
Ancillary Testing Coordinators
Jacquelyn Gray, MT(ASCP)..... 70713
Tamara West, MS-CPM, MLS(ASCP)^{CM}..... 73697
Christy Clemens, MLS(ASCP)^{CM}..... 70723
Laboratory Information Managers
Glenn Vale, MT(ASCP) 72102
Haskell Ellis, MT(ASCP) 70717
Justin Ngo, MLS(ASCP)^{CM}……70678
Safety Officer
Diana Perez-Veliz, MLS(ASCP)^{CM} 70693

STAFF PATHOLOGISTS

Shelby D. Melton, MD ..... 70726 pgr. 214-786-4583
Ellen Araj, MD……..70697
Bradford Barker, M.D..... 70712 pgr. 214-759-2232
Toby Gray, M.D. ..... 70721 pgr. 214-759-4073
Mariam Mir, MD ..... 70578 pgr. 214-759-4237
Daniel R. Nussenzveig, M.D., PhD. ..... 71269 pgr. 214-759-1953
Roshan K. Patel, M.D. ..... 70325 pgr. 214-786-0322
Megan B. Wachsmann, M.D ..... 70724 pgr 214-786-5531

On-Call/Frozen Section Pager..... 214-759-3341
Pathology Resident Office 70679/71532/75244

ANATOMIC PATHOLOGY SECTION

AUTOPSY UNIT
Director: Bradford Barker, MD 70712
Supervisor: Shayla Powell, MLS (ASCP)^{CM} 70659
Autopsy Suite 70688
Preliminary Autopsy Report 70677/70668

Paper Copies are not Document Controlled

CYTOPATHOLOGY UNIT 76687
Director: Mariam Mir, MD 70578
Supervisor: Shayla Powell, MLS (ASCP)CM 70659
Preliminary Cytology or FNA Report 70677/70668

SURGICAL PATHOLOGY UNIT
Director: Bradford Barker, MD 70712
Supervisor Histopathology: Shayla Powell, MLS (ASCP)CM 70659
Histology lab 70687
Preliminary Biopsy Report 70677/74227/70668

TRANSCRIPTION UNIT 70677/70668

CLINICAL PATHOLOGY SECTION

CLIENT SERVICES AND IMMUNOPATHOLOGY
Director Client Services: Megan Wachsmann, M.D. 70724
Director Flow Cytometry: Daniel Nussenzveig, M.D., PhD 70325
Director Molecular Diagnostics: Megan Wachsmann, M.D. 70724
Supervisor: Jennifer Wais, MLS (ASCP)CM 70278
Lead Technologist
- Client Services 70666
- Flow Cytometry 70268
- Immunology (Serology) 70260
- Molecular Diagnostics) 70287
- Referral Testing. 70691

CORE LABORATORY UNIT
Co-Directors: Shelby D. MeltonM.D. 70726
Daniel Nussenzveig, M.D……..71269
Supervisor: Rochelle Hurd, MT(ASCP) 70711
- Chemistry/Special Chemistry 70699/70700
- Hematology 70686/72689/72690
- Coagulation 72687
- Urinalysis 70671

MICROBIOLOGY UNIT 70672
Director: Toby Gray, M.D 70721
Supervisor: Bonnie Greene, MHA, MT(ASCP) 70673
- Bacteriology (Routine) 76627
- Blood Cultures 76626
- Specimen Processing 76623
- Mycobacteriology 76676
- Mycology 76620
- Parasitology/Occult Blood 76622

PHLEBOTOMY UNIT
Phlebotomy Supervisor: Selma Gomez Carney, MT(ASCP)CM 70698/70719
Outpatient Phlebotomy Lead Technician: 70719
Inpatient Phlebotomy Lead Technician: 70736
Evening Shift Lead Technician:……70736

TOXICOLOGY UNIT 70654/70665
Director: Shelby Melton, M.D. 70726
Technical Director: Dwain Fuller, F-ABFT 70690
Supervisor: Whitney Kebenzikato, MT(ASCP) 70674

Paper Copies are not Document Controlled

TRANSFUSION MEDICINE UNIT 70720/70725/70683
Medical Director: Daniel R. Nussenzveig, M.D., PhD 71269
Supervisor: Sun Y. Son, MT(ASCP)SBB..... 70727

EVENING SUPPORT UNIT 70666
Supervisor: Lois Tate, MT(ASCP)

MIDNIGHT SUPPORT UNIT 70666
Supervisor: McKenzie Mrazek, MT(AMT)

FORT WORTH OUTPATIENT CLINIC LABORATORY

Supervisor: Walter Emholtz, MT(ASCP) 817-730-0074
Laboratory 817-730-0347/0348/0349

SAM RAYBURN MEMORIAL VETERANS CENTER (BONHAM) LABORATORY

Supervisor: Taja Colbert, MLS (ASCP)CM..... 903-583-6269
Laboratory 903-583-6268

Paper Copies are not Document Controlled

PATHOLOGY & LABORATORY MEDICINE SERVICE
GUIDELINES FOR LABORATORY USE

I. LOCATION:

Pathology & Laboratory Medicine Service is located on the first floor of the Clinical Addition (South end).

II. HOURS OF OPERATION:

A. The main laboratory is open 24 hours per day, 7 days per week, with a Client Services Unit for the receipt of specimens. Regular working hours are from 8:00 a.m. - 4:30 p.m., Monday through Friday. A limited staff is on duty after regular hours, weekends and holidays.

B. The Outpatient Phlebotomy room (1B-220) is open from 6:00 a.m. - 4:30 p.m., Monday through Friday and on a limited basis every Saturday from 6:00 a.m. – 2:30 p.m. Outpatient Phlebotomy services are not available on Sundays or holidays. Outside these hours, phlebotomy will be performed by nursing personnel or physicians.

C. The Inpatient Phlebotomy Section will provide collection of inpatient blood samples between the hours of 5:00 a.m. and midnight, seven days a week, including holidays. Early morning phlebotomy begins at 5:00 a.m. Regular collections are scheduled every two hours. Exceptions to the above are: MICU, SICU, TICU, Step Down Units, Dialysis (3A), Emergency Department, Surgical Recovery Room, Cardiac Catheterization & Electrophysiology Sections, Radiology Suites, and the Domiciliary.

III. CUSTOMER SERVICE:

The laboratory provides wide-ranging customer service regarding lab-related issues to our customers upon request. Please contact Client Services at extension 70666/70714.

IV. LABORATORY ORDERS:

Laboratory orders are entered into the computer (CPRS) using the WRITE ORDERS option in the ORDERS tab.

A. ORDER ENTRY:

All test requests <u>except</u> Anatomic Pathology and Blood Bank (Sect. C, page 7) must be entered into CPRS before the samples are delivered to the laboratory.

1. **Collection Type:**

   a. ***Ward Collect*** - This option is used when blood specimens are to be collected by ward personnel. Order ward collect any time a patient has a PICC line and between the hours of midnight and 5:00 am.

   b. ***Send Patient*** - This option is used for ambulatory patients who will be sent to the outpatient phlebotomy area for sample collection.

   c. ***Lab Collect*** - This option is used when routine inpatient blood specimens are to be collected by P&LMS phlebotomy personnel.

   d. ***Immediate Collect*** – This option is used when inpatient blood specimens are to be collected by P&LMS phlebotomy personnel and are designated as 'STAT' urgency or need to be drawn at a specified time.

2. A unique order number is automatically generated by the computer when a laboratory test request is entered into the computer.

Paper Copies are not Document Controlled

3. The order number is in the electronic medical record (CPRS) next to the written order once it is entered and signed via computer. This will serve as the cross-reference for any future questions. This order number must also be written on the specimen labels from units where barcoded labels are not printed.

4. The order number is the only identifier and cross-reference the laboratory has to appropriately process the sample. Please ensure correct transcription of the number from the screen to the sample.

B. ADDING TESTS TO AN EXISTING ORDER:

Tests may be added to a previously collected sample by ordering the new test(s) in CPRS and notifying the Client Services Unit (CSU) at ext. 70666/70714. "Add-on" test(s) must match the original sample type.

To add a test(s) to a previously collected sample:

- Order the additional test(s) in CPRS.
- Contact CSU with the "add-on" request at ext. 70666/70714.
- Provide the following information to CSU:
    - Patient's full name and complete SSN
    - Additional test(s)
    - Old order number
    - New order number
    - Provider name and a contact number (phone or pager)

C. LAB SECTIONS NOT ON WARD ORDER ENTRY:

1. Surgical Pathology Orders – A fully completed tissue examination form (SF-515) must be submitted with each sample. The Histology section will accession the requests into VistA. The Transcription Section will enter the results into VistA. Surgical pathology results can be accessed through CPRS using the 'Reports' tab. Click on the 'Anatomic Path Reports', then choose 'Surgical Pathology,' 'Cytopathology', 'Autopsy,' or 'Electron Microscopy.'

2. Cytology Orders - A fully completed tissue examination form (SF-515) must be submitted with each sample. The Cytology Section will accession the specimens into VistA in the laboratory. The Transcription section will enter the results into VistA. Cytology results can be accessed through CPRS using the 'Reports' tab. Click on the 'Anatomic Path Reports', then choose 'Cytopathology'.

3. Autopsy Requests – a completed autopsy permit consisting of a SF-523 "Authorization for Post-Mortem Examination" must be appropriately filled out, bearing the signatures of the legal next of kin, the physician and two witnesses who are medical center employees. See VANTHCS Memorandum 11-15 Post-Mortem Examination for complete details.

4. Transfusion Medicine Orders -

    a. Select "Blood Bank Orders" on left side of screen, click to open.

    b. The following options are displayed: Type and Screen only, Blood Bank Transfusion Orders, Pre-Op Orders (includes inpatient orders and outpatient orders), Intra-Op Orders (used only by surgical staff for patients currently in the Operating Room), Large Volume Transfusion Protocol for Life Threatening Bleed, and Transfusion Reaction Work-up.

    c. Select the appropriate order and click to open page.

    d. Fill in applicable information.

Paper Copies are not Document Controlled

e. Type and Screen and Blood Component orders are for inpatients currently admitted to the hospital. Do not order for outpatients.

f. Refer to the Blood Bank (Transfusion Medicine) section in this manual for more information.

A completed SF-518 (Blood or Blood Component Transfusion Form) and a 7 mL pink top or 10 mL purple top (EDTA) tube labeled with patient identification (full name, full SSN), date, time, and initials of collector must be submitted directly to the Transfusion Medicine Unit (room 1B-306) for Type and Screen and/or Blood Transfusion orders.

The completed SF-518 must include the patient's full name, full SSN, component requested, type of request, date and hour requested, requesting physician, diagnosis, collector's signature, verifier's signature, date and time verified.

Laboratory staffing between 4:00 p.m. and 8:00 a.m., weekends, and holidays, is for emergency transfusion services only.

NOTE: UNCLEAR ORDERS. Test orders that may be unclear (non-standard, non-specific terminology, etc.), must be clarified prior to continuation of testing by contacting the provider or other health care professional who placed the order. Specimens will be processed to maintain sample integrity if there is a delay in clarification of test orders.

V. SPECIMEN TESTING PRIORITY: - Three testing priorities are available:

Routine:

Results for most tests will be available within 2-8 hours from time of receipt in laboratory. Most tests are defaulted to this priority in the computer.

STAT:

Results will be available within 1-2 hours of receipt. This priority is used in lieu of Medical Emergency, if the survival of the patient is not dependent upon expeditious results.

Medical Emergency:

Results will be available within 1 hour of receipt. This priority is reserved for use when the survival of the patient is dependent upon test results. Please refer to Specimen Delivery (Section VII, D) for further information on Medical Emergency requests.

VI. PHLEBOTOMY SERVICES:

Pathology and Laboratory Medicine Service will be responsible for collecting blood samples for patients of local outpatient clinics and specified inpatient units as per Section II. For Hours of Operation, see II B and C above. For additional information, see the Phlebotomy Section of this manual.

VII. SPECIMEN COLLECTION, LABELING, AND DELIVERY TO THE LAB:

To ensure that patient samples are in no way compromised due to improper collection or handling, and to be in compliance with the Joint Commission, CAP, and VHA laboratory testing standards, the guidelines below must be followed when submitting specimens to the laboratory:

A. COLLECTION LISTS:

1. LAB COLLECTION DRAW LIST – Collection list printed by the inpatient phlebotomy

Paper Copies are not Document Controlled

team prior to being dispatched to the various units for scheduled sample collections. The draw list includes all 'Lab Collect' orders that have been placed on patients on the ward. As patient samples are accessioned into the lab, the orders will drop from the list.

2. The WARD COLLECTION SUMMARY LIST option (on all ward personnel menus in VistA only) will provide the user a list of all WARD COLLECT and SEND PATIENT orders placed for a given day.

3. The WARD COLLECTION SUMMARY LIST is printed by MAS clerks daily and placed in an accessible area, so that in the event of an unscheduled computer downtime it can be immediately referenced.

4. The LAB COLLECTION list is printed at designated times throughout the day by inpatient collection personnel and placed in an accessible area, so that in the event of an unscheduled computer downtime it can be immediately referenced.

B. SPECIMEN COLLECTION AND LABELING:

1. **UNLABELED SAMPLES are not accepted for laboratory testing.** Every effort is made to notify the collector or attending physician if an unlabeled sample is submitted, to allow for timely recollection.

2. An accurate laboratory work-up begins with the proper collection and labeling of patient specimens. Samples should be of adequate quantity, in an appropriate in-date container, and properly labeled. Requirements for most types of specimen collection, types of tubes, and special precautions are listed under the INDEX OF LABORATORY TESTS in this manual. Detailed information can also be accessed in CPRS using "Lab Test Information" in the "Tools" bar. Please contact the laboratory Client Services Unit (ext. 70666) with any questions regarding special collection or handling procedures.

3. **Patient Identification Procedures:**

   a. Pre-Collection Identification: **Two identifiers must be used when confirming patient identity. The identifiers must match exactly.**

      1) Inpatients: Inpatients will have wrist (or ankle) identification at all times during their hospital stay. Staff members will look at the identification band and verify the patient's full name and date of birth (DOB) – with either the patient's verbal response, or paperwork when applicable. Full social security number (SSN) will also be verified visually by comparing the specimen label(s) with the patient ID band.

      2) Outpatients: Clinic and Home Care patients are asked to show their Veterans Health Identification Card (VHIC) each time service is provided. Staff members will look at the card and verify the patient's full name and at least one other identifier with the patient's verbal response. The patient is asked to state full name (first, last) and date of birth (DOB). The patient's response must be identical to the information listed on the request form and/or specimen label. If the identification card does not have a unique VistA compatible barcode or the full SSN, the patient is asked to complete a P&LMS provided fill-in card (full name, DOB, and full SSN) to compare for complete verification.

      3) Comatose, disoriented, or incoherent patients: Ask family member/legal guardian or accompanying adult to identify the patient, or use picture identification, and compare the information given to that listed on the wristband (inpatients) or VHIC card (outpatients). Verbal identification is confirmed by comparison with written documentation when possible.

      4) Visually impaired patients: Ask the patient for a form of Identification that includes

Paper Copies are not Document Controlled

their SSN. If the patient is unable to provide a SSN, the patient is instructed to whisper the SSN to the phlebotomist.

b. **Patient Sample Labeling:**

1) Ensure that the patient's full name, full DOB, and full SSN as listed on the sample(s) exactly matches the identification listed on the electronic (order number) or paper requisition.

2) **Specimens must be fully and appropriately labeled immediately upon collection in the presence of the patient**. If laboratory barcode labels are not used, the patient's identification card may be used to prepare a stamped/written label to provide the following:

- Complete legible name of patient
- Complete social security number
- Date and time of collection of the specimen (especially for time sensitive test)
- Initials of the person who collected the specimen
- Source, body site, or specimen type for samples other than peripheral blood (i.e., right femoral artery, left pleural fluid, abscess left groin)

3) The identifying label is placed on the sample container(s) at the time of collection in front of the patient. Outpatients are asked to visually verify the label information on their samples.

4) Containers and test packets for tests requiring patient self-collection (i.e., fecal occult blood samples, urine containers) may be pre-labeled, but require verification with the patient to confirm complete identifiers (full name, full SSN) prior to hand-off of the collection container.

5) Place specimens for each unique patient in a single biohazard transport bag. **DO NOT** place specimens (or labels) from more than one patient in a single biohazard transport bag. **Samples from more than one patient in a single biohazard transport bag are rejected**.

Additionally, the computer-generated order number, when applicable, should be noted on the label. Do **not** place identification labels over the barcodes on bottles or tubes.

4. Feedback to phlebotomists regarding specimen quality (GEN.40499) is performed by the discovering technologist, inpatient phlebotomy lead technician, and/or phlebotomy supervisor/supervisor if specimen quality has been decreased or compromised due to hemolysis, insufficient sample, clots, etc. Records of phlebotomy feedback are documented and education/counseling is conducted as appropriate.

C. PAPER REQUISITIONS:

The demographic information on the requisition must match that of the sample label:

- Complete and legible name of patient
- Complete social security number
- Date of birth
- Complete name and signature of requesting physician and pager number. Referral tests will require the physician's signature and pager number and/or extension where physician can be reached.
- Location of patient
- Sex
- Name of the tests requested

Paper Copies are not Document Controlled

- Date and time of collection of the specimen
- Specimen type, source and/or anatomic site with laterality when indicated, i.e., joint fluid (right or left knee), throat culture, pulmonary cytology, etc.
- Computer generated order number (when applicable).

D. SPECIMEN DELIVERY:

1. All patient specimens, except those for Transfusion Medicine, must be delivered to the Client Services Unit (CSU) as soon as possible after collection. Samples must be placed in a sealed plastic transport bag bearing a biohazard symbol. Samples from only one patient per biohazard transport bag are acceptable. **Samples from more than one patient in a single biohazard transport bag are rejected**. Place requisition in the outer pocket of the bag to avoid contamination. Samples are brought directly to the CSU window (1B-311), the pneumatic tube system (below), or sent by the ABC Transport System (below).

2. Transfusion Medicine (Blood Bank) samples must be delivered directly to the Transfusion Medicine window, room 1B-306 in the Clinical Addition. This window is staffed 24 hours per day, 7 days per week. Samples for Type and Screen/Blood Component Orders requiring Type and Screen (T&S) must be accompanied by a complete, legible, and properly labeled SF-518 form. Samples are rejected without the complete, properly labeled SF-518 form. Refer to Blood Bank, Transfusion Medicine Section, IV. REQUEST FOR BLOOD COMPONENTS: A.2. of this manual for detailed information on sample collection, delivery, and acceptability.

3. Each "Medical Emergency" test request must be assigned a separate and unique order number. These requests require special handling and processing procedures to ensure timely results. Medical Emergency samples are delivered directly to CSU. Kindly alert Client Services personnel verbally when submitting "Medical Emergency" samples at the CSU window.

E. ABC TRANSPORT SYSTEM:

Non-emergent ("routine" urgency) patient samples are delivered to the clinical laboratory using the ABC Transport System ("the train").

1. **Only designated ABC lab cars** are used to transport patient samples. These cars are clearly labeled "Biohazard" and "Lab Samples Only." Unlabeled cars are used for all other materials, such as patient files, paperwork, or SPS supplies.

2. Patient samples must be placed in sealed biohazard bags with any accompanying paperwork placed in the outside sleeve. **Only one patient's samples per biohazard transport bag**. The bags must be placed in one of the two metal baskets hanging in the train car. Please ensure that all urine, sputum, and stool sample caps are securely tightened before placing in biohazard transport bags.

3. Send the train cars to laboratory stations #28 or #29.

4. Empty lab cars are called to the sender's station by pressing "Special Call" on the keypad.

5. The status of all cars sent to the lab can be checked at any time by pressing the "INFORMATION" on the keypad. Pressing INBOUND will list the car number and sending station. Pressing OUTBOUND will list the car number and destination station, Pressing ARRIVALS will display the history list of all cars that have arrived at that station.

6. "Medical Emergency" and "Transfusion Medicine/Blood Bank" samples should be hand-delivered to the laboratory, as the patient's survival depends on the timeliness of results. The ABC System should NOT be used for these samples.

7. Some patient samples should **never** be transported by the ABC system. These include 24-

Paper Copies are not Document Controlled

hour urine jugs and jars of alcohol that contain patient smears on glass slides. Other unique, non-re-collectable samples (CSF, joint effusion, etc.) should be similarly hand-delivered by collecting personnel or delegate, to ensure that the specimen is accessioned and processed without delay. **The ABC System should NOT be used for these samples**.

8. For all operational problems with the ABC system, call the ABC Transport office at ext. 71062 (weekdays) or the Energy Center at ext. 71139 (nights, weekends, and holidays).

F. Pneumatic Tube System:

Samples from the Emergency Department (ED), Clinical Decision Unit (CDU), and Spinal Cord Injury (SCI), Cardiac Care Unit (CICU), Medical Intensive Care Unit (MICU), Surgical Intensive Care Unit (SICU), Thoracic Intensive Care Unit (TICU) center may be delivered to P&LMS Client Service Unit (CSU) utilizing the pneumatic tube system. Under normal operating conditions, samples will arrive in CSU within two minutes of leaving the sending station.

1. Samples must be placed in sealed biohazard bags with any accompanying paperwork placed in the outside sleeve of the bag **Only one patient's samples per biohazard transport bag**. Then the bags are placed in the foam insulated pneumatic tube carrier (bullet). Do not overfill the individual biohazard bags because this may prevent proper sealing of the biohazard bag. **Do Not use the bullet without foam insulation**.

   It is imperative that samples are securely bagged and tightly sealed to prevent any spillage within the pneumatic tube system. Spillage may cause electrical shorting of circuitry which would shut down the system.

   Blood culture bottles are susceptible to breakage if not properly handled, so only one set is placed in a biohazard bag at a time for transport in the pneumatic tube.

   Urine, sputum, and stool samples must have the container lids securely tightened and double bagged. Ensure that both bags are tightly sealed.

   Do not place glass alcohol jars containing glass slides or 24-hour urine jugs in the pneumatic tube system. These samples must be hand delivered to the laboratory.

2. Place the biohazard bags in the bullet. Make sure the biohazard bags are not protruding from the bullet before locking the safety latches at each end of the bullet. Do not overload the bullets (keep <5 pounds). Send samples that are too large or too heavy for the bullet in the ABC transport system or hand deliver.

3. Place the securely locked bullet into the vertical sleeve and type in the station number on the touchpad (on the front of the pneumatic tube station) that samples will be sent to. The stations and their station numbers are:

   Clinical Decision Unit (CDU) (#100)
   Client Services Unit (#101)
   Spinal Cord Injury (#102)
   Emergency Dept (ED) (#103)
   Medical Intensive Care Unit (MICU) (#151)
   Cardiac Care Unit (CICU) (#152)
   Surgical Intensive Care Unit (SICU) (#153)
   Thoracic Intensive Care Unit (TICU) (#154)

4. Select the location under the Directory button. Push the "Send Normal" pad to activate the system and to send the bullet to the selected station.

5. When the bullet arrives at the selected station an audible alarm will sound to alert staff that a bullet has arrived. Press the "Silence Alarm and then "Yes" to turn off the alarm and then remove the bullet.

Paper Copies are not Document Controlled

6. Open the safety latches at each end of the bullet and remove samples.

7. Close safety latches and place empty bullet back into the vertical sleeve. Select the location under the Directory button. Push the "Send Normal" pad to activate the system and to send the billet to the selected station.

8. Do not keep more than four bullets at each station. Keeping more than four bullets could cause the system to shut down.

9. Call the Energy Center (71139) during for all pneumatic tube operational problems.

VIII. SAMPLE ACCEPTABILITY/REJECTION CRITERIA:

Unlabeled samples are rejected, and recollection will be required (refer to Section VII B, "Specimen Collection"). More than one patient's samples (or labels) in a single biohazard transport bag are all rejected.

It is essential that the samples are delivered immediately upon collection for quality analytical results. The optimum time to physically separate serum/plasma from cell contact is within 2 hours after collection.

Specimens inappropriately preserved, leaking or cracked tubes or containers, grossly hemolyzed blood samples, clotted samples drawn in an anticoagulant, blood specimens contaminated with I.V. fluid, or insufficient amounts of blood (e.g., less than 1 mL for chemistry profiles) are unacceptable. Refer to the Index of Tests (yellow pages, this manual) or the Lab Test Information (CPRS) for specific sample requirements. The ordering provider/ward charge nurse will be notified, and a new specimen will be requested.

A. **Hematology:** Sedimentation Rate should be analyzed within 4 hours after collection. Samples for CBC with Auto diff. are stable up to 24 hours at room temperature, and 48 hours if refrigerated. Clotted or under-filled (<2mL) EDTA (lavender top) tubes are unacceptable. Fluid samples for cell counts submitted in syringes are unacceptable. Blue top for platelet is stable at room temperature for 24 hours. Do not refrigerate.

B. **Coagulation Studies**: Sodium citrate (light blue top) tubes must be filled to "draw capacity" (blue bar on tube label). Clotted samples, hemolyzed plasma, and specimens drawn from a heparin lock are considered unsuitable for analysis. Coagulation samples for PT testing can be analyzed up to 24 hours after collection if the tube is at ambient temperature; however, samples for PTT, D-Dimer, and Fibrinogen must be assayed within 4 hours of collection. PTT Heparin samples must be spun within 1 hour of collection.

C. **Chemistry:** Samples for chemistry testing and therapeutic drug monitoring should be analyzed within 8 hours after collection. Samples that must be placed on ice (lactate, ammonia-delivered within 30 minutes of collection, fluid pH, and ionized calcium) are to be delivered immediately. Disclaimers are included with the final patient report on hemolyzed samples.

D. **Urinalysis:** The optimum time to deliver urinalysis samples to the laboratory is within 1 hour of collection. If unable to deliver within one hour of collection, refrigerate and deliver as soon as possible during the shift.

E. **Bacteriology, Mycology, and AFB specimens** should be processed as soon as possible. Deliver specimens submitted for microbiological cultures to the laboratory as soon as possible after collection. Urine and sputum samples may be temporarily refrigerated if delivery to the lab will be delayed. Failure to properly collect specimens or delays in transport could lead to compromised specimens and erroneous culture results.

   Blood Cultures -Myco/F Lytic bottles (for AFB and/or fungus cultures) must contain at least 1-5 mL of blood per bottle. Those collected with less than 1 mL per tube are processed; however, a

Paper Copies are not Document Controlled

"short draw" disclaimer will be reflected in the report

Blood culture bottles submitted for bacterial culture must contain at least 8 - 10 mL of blood per bottle. Optimally, 20 mL of blood per culture set (2 bottles) is collected. Larger volumes of blood increase the yield of true positive cultures. Samples containing less than 8 mL per bottle are processed; however, a "short draw" disclaimer will be reflected in the report.

Sputum specimens submitted for culture on swabs are not accepted.

Swab specimens submitted for anaerobic cultures are not accepted.

Stool specimens submitted for ova & parasite examination must be free of interfering substances (barium, magnesium, kaolin, bismuth compounds, castor and mineral oils, etc.).

Formed stool specimens submitted for *Clostridioides difficile* PCR testing are rejected.

Cerebrospinal and Other Body Fluid Specimens: When an inadequate sample volume is submitted, the report will note that the culture results may be compromised due to the limited sample volume received.

F. **Cytology/Histology specimens** should be delivered as soon as possible.

Tissue Examination Request Forms (SF-515) - Samples for cytology and surgical pathology that are submitted without requisitions, or incomplete or illegible requisitions, are unacceptable and will require correction or completion of the requisition by the clinical staff before results can be made available.

G. **Flow Cytometry:** CD4/CD8 Samples: Clotted, hemolyzed, frozen, shipped on ice, or under-filled (<1 mL) small EDTA (4mL) tubes are rejected and a redraw requested. Specimen must be at room temperature. NOTE: Samples are stable up to 4 days at room temperature.

H. **Molecular Diagnostics:** HBV/HCV/HIV-1 Quantitative Viral Load testing and: Whole blood samples >24 hours old, frozen samples stored in primary tubes, and plasma samples improperly collected, stored, or exceeding stability will be rejected and a redraw requested. Highly soiled rectal swab specimens for CT/NG testing are rejected and a recollect is requested.

I.

J. **Immunology:** Samples for immunology testing should be analyzed within 8 hours after collection. Vaginitis testing: Vaginal samples improperly collected, stored, or exceeding stability are rejected and a recollect requested.

J. **Toxicology:** Urine samples may be delivered directly to the secure, access restricted Toxicology section (room 2C-403) until 3:00 p.m. Monday-Friday. After 3:00 p.m. and on weekends and holidays deliver urine samples to the Client Services Unit within 2 hours of collection or refrigerate and deliver as soon as possible.

K. **Transfusion Medicine (Blood Bank):** All samples submitted for “Type and Screen” (T&S) or “Blood Component Orders” requiring T&S must be accompanied by a complete, legible, and properly labeled, SF-518 form. If either the sample or the SF-518 is unlabeled, incompletely labeled, or illegible, both the sample and the SF-518 form will be rejected by the Transfusion Medicine Unit staff and recollection requested.

L. **Referral Testing:** Please call the Referral Testing section at extension 70691 regarding specific referral testing information. P&LMS provides referral laboratory service for patient specimens when specific tests are not performed in-house. The user of this manual should assume that tests not listed may fall into the category of a "fee basis referral test." It is recommended that the CPRS user option, LAB TEST INFORMATION, located in the TOOLS dropdown menu, be utilized as a resource for information related to any test a provider may desire to have performed. The Client Services Unit (ext. 70666) will assist users with this information.

Paper Copies are not Document Controlled

A laboratory e-Consult request is required for referral tests that are not orderable in CPRS. The laboratory e-Consult is ordered in CPRS as "Miscellaneous Lab Test Request" under the Dallas Consult Services, Pathology and Laboratory Medicine. Consults requested for tests that are orderable in CPRS will be closed without action.

Only VA paid staff providers are authorized to spend federal funds (i.e., order reference lab tests). Refer to VANTHCS Memorandum 141-02 for responsibilities in utilizing consults.

A laboratory Pathology Molecular Test consult is required for referral testing associated with the National Precision Oncology Program. Consults are reviewed by a pathologist prior to being sent for testing. The e-consult is ordered in CPRS as "Pathology Molecular Testing Request" under the Dallas Consult Services, Pathology and Laboratory Medicine.

IX. REPORTING OF RESULTS:

A. PRINTED REPORTS FOR THE MEDICAL CHART:

1. All test results are immediately available to the provider as soon as the data is verified in VistA. The provider may, at any time, determine the progress of a given order by going to the 'LAB' tab computer option in CPRS, then selecting the LAB STATUS tab.

B. CRITICAL VALUES/RESULTS

Critical ("Panic") Values/Results are those results that fall so significantly outside of normal test ranges that, if they are not acted upon, may present significant risk to the patient (Refer to Medical Center Memorandum 11-14, "Communicating Test Results to Providers and Patients"). Critical values will be called/paged to ordering provider within one hour of test completion. The notification cascade will be followed as per Medical Center Memorandum 11-14: notify initial individual on cascade, if unable to reach within 15 minutes proceed to notify next individual on cascade, etc. All critical results communicated will require write-down/read-back (see VANTHCS Memorandum No. 00-07, Read-Back Requirements) to ensure the result is communicated accurately. For all testing services, the communicating physician, therapist, or technologist will document in VistA the name of the Authorized Licensed Professional (ALP) who received and read back the critical value, and the time the message was communicated.

1. Inpatient Cascade:

   a. Regular work week (8:00 a.m. to 4:30 p.m., Monday through Friday): notify ordering ALP, Attending for ordering ALP's team, Section Chief, Service Chief.

   b. 4:30 p.m. to 8:00 a.m. during the workweek, holidays, and weekends: notify ordering ALP, Cross-cover ALP, Attending for cross-cover team, Service Chief.

2. Outpatient Cascade:

   a. Regular work week (8:00 a.m. to 4:30 p.m., Monday through Friday): notify ordering Authorized Licensed Professional (ALP), Critical Results Pager (CRP) for section, Chief of Section, if applicable, Chief of Service.

   b. Regular work week after hours (4:30 p.m. to 8:00 a.m., Monday through Thursday), holidays, and weekends (Friday 4:30 p.m. through Monday 8:00 a.m.). If a holiday falls on Tuesday, after hours will be 4:30 p.m., Monday, to 8:00 a.m., Wednesday. Notify ordering ALP, Emergency Department (ED) – The Medical Officer of the Day (MOD) may be contacted at extension 71975.

3. Exceptions – Inpatient Intensive Care Units (MICU, CCU, TICU, and SICU):

   a. At all times: Critical results may be called to any available physician in the ICU.

Paper Copies are not Document Controlled

b. At all times: if the critical value/result is a PTT for a patient who is on an anticoagulation (Heparin drip) protocol, the critical result may be communicated directly to the RN who is taking care of the patient.

c. At all times: if the critical result is a blood glucose value for a patient who is on an insulin drip protocol, the critical results may be communicated directly to the RN who is taking care of the patient.

d. In all the above cases, the receiving party will perform write-down/read-back.

e. ICUs may be contacted at the following numbers:

1. CCU: 72181, 72182, or 72184
2. MICU: 71659, 71660, or 71661
3. SICU: 71619 or 71620
4. TICU: 71624 or 71625

4. Exception: Protime Clinic:

a. Normal duty hours, 8:00 a.m. to 4:30 p.m.: Anticoagulation Clinic will be notified of critical lab results via the Critical Results Pager at (214) 749-2215. A second method is to contact a clinic provider at extension 71963. Write-down/read-back must be done.

b. After normal duty hours, 4:30 p.m. to 8:00 a.m. and weekends: Call the ED – The Medical Officer of the Day (MOD) may be contacted at extension 71975.

Note: The ordering physician can also choose to receive critical values alerts in CPRS by going to the TOOLS option and turning on the notification setting. However, use of this option will not replace the telephone notification.

C. ALERT RESULTS:

Alert values are those lab values above or below the reference or therapeutic ranges that are very abnormal and for which notification of the ordering provider is appropriate. Notification is made by telephone within four hours of test completion.

D. ABNORMAL RESULTS ALERTS:

If the ordering physician would like to receive notification of abnormal laboratory test results in CPRS (excluding microbiology and anatomic pathology), the Abnormal Results Alert option is activated by selecting the TOOLS/OPTIONS tab and turning on /off any of the notifications listed except those denoted as mandatory. Be mindful that if 'Abnormal Lab Results' is chosen; all abnormal lab test results will result in a notification sent. The option cannot be set to receive only specific lab test results.

E. TELEPHONE RESULTS:

Requests for laboratory results by telephone are discouraged. The Privacy Act of 1974 and HIPAA places specific restrictions on the dissemination of private patient information. All verified data is immediately available via the computer and can be printed out as needed.

F. CORRECTION OF ERRONEOUS RESULTS:

If erroneous lab results have been verified on a patient, the correct results must be reported. The ordering physician is notified of the correction by a notification comment entered into the computer system.

The entry of "Comment" (#) in the results field or change in a result will automatically cause a comment, "___ incorrectly reported as ___" to appear in the computer for each test. This computer-

Paper Copies are not Document Controlled

generated comment must not be deleted. This comment is automatically generated every time there is a change in a previously verified result (in sequential order). The comment indicates the person making each change and the date and time each change was made. A supervisory report, "Audit of Deleted/Edited Comments," is run each month to assure that these comments have not been deleted. The supervisor may also use the option "Changes in Verified Lab Data" to periodically track any verified result changes by employees. This process applies to all section of the Clinical Laboratory except Microbiology. Manual entry of culture corrections are entered by the technologist.

All comments (computer-generated and those manually entered) are displayed when reviewing results on the computer screen or when a lab report is printed.

NOTE: Any time test results are verified, whether it be initial verification, or when results are corrected and verified, new lab reports are automatically generated.

Erroneous results of significant deviation will initiate provider notification by phone. A result of significant deviation is one that changes the result from a normal result to an abnormal result, or an abnormal result to a normal result. Refer to individual section policies for further information.

X. ACCESSING LABORATORY TEST RESULTS IN CPRS:

A. Laboratory test results are contained in CPRS, the VA's clinical computer system. All staff and house staff are encouraged to become familiar with CPRS and use it to facilitate their interaction with the laboratory. Pathology & Laboratory Medicine Service will provide assistance to any provider desiring assistance in its use.

Computer operations are not under the authority of Pathology & Laboratory Medicine Service; therefore, all operational problems should be referred to Information Technology (IT) Help Desk.

B Laboratory test results can be accessed in CPRS in the following ways:

1. COVER SHEET: Recent laboratory test data is listed in the lower left-hand corner of the cover sheet.

2. ORDERS TAB: Select 'Lab Tests" under the 'Write Orders' column on the left side. An alternative is to select 'Quick Orders', proceed to the appropriate menu, then select either the lab order menu or 'Other Lab Tests.' Under the lab order menu, there are tests already set up (quick orders) that require minimal input from the clinician to complete the order; however, the order, including test urgency, can be changed to fit the individual clinician's needs. Under 'Other Lab Tests', the clinician must input all the pertinent information into the order.

3. REPORTS TAB: Laboratory test results are contained in the 'Clinical Reports' area. Click on the + Lab to expand the tree structure. Once expanded, the following options are available:

   - Blood Availability – Lists what is currently cross-matched for the patient.
   - Blood Transfusion – Lists the component type and number of all blood products transfused.
   - Blood Bank Report – Lists the current and previous blood product requests with the patient's blood type and antibody screen/identification. Lists the blood products currently available or issued in the past 24 hours, if applicable.
   - Surgical Pathology Report – Lists all surgical pathology reports for that patient.
   - Cytopathology – Lists all cytology and FNA reports for that patient.
   - Lab Orders – Lists all lab orders for a specific date range.
   - Chem. & Hem – Lists lab orders for a specific date range that can be sorted (click heading to sort).
   - Microbiology – Lists all microbiology reports. Select 'Most Recent Test' to locate Occult Blood, *C. difficile* toxin, Lactoferrin, Carba-R PCR,-MTB/Rif, Respiratory Panel, BCID results, and SARS-CoV-2 PCR (Cepheid).

Paper Copies are not Document Controlled

Laboratory test results are also contained in the 'Health Summary' area. Click on Health Summary to expand the tree structure. The following options are available upon expansion:

- Lab Status – Same as Lab Tab (below)
- Blood Bank Status – Same as Lab Tab (below)

Various Anatomic Pathology reports are contained in the 'Anatomic Pathology' area. Click on + Anatomic Pathology to expand the tree structure. The following options are available upon expansion:

- Surgical Pathology – Surgical pathology reports.
- Cytopathology – Cytology and FNA reports.
- Autopsy – Autopsy reports, when available.

Laboratory test results are also available in the Daily Order Summary area. Click on + Daily Order Summary to look at all the orders for today. This report gives the order summary within the date range. To print a chart copy summary, select the device and print the needed report.

4. LAB TAB – Under the left column ('Lab Results') there are several options to choose from:

   - Most Recent – Lists the most recent laboratory test data (cannot print from this option)
   - Cumulative – Lists laboratory test data in a cumulative format for easy comparison (cannot print from this option)
   - All Tests By Date – Lists all tests for date range indicated in lower left corner.
   - Selected Tests By Date – Select only the relevant tests desired. Type in the test, click on 'Add', then 'OK' when the list is complete.
   - Worksheet – Predefined test groups can be displayed. These tests can be arranged by specimen and by the order in which they will be displayed.
   - Graph – Lab test data can be graphed for easy comparison over a period of time.
   - Microbiology – Lists microbiology reports for the date range indicated.
   - Anatomic Pathology – Lists Anatomic Pathology reports for the date range indicated.
   - Blood Bank – Lists Blood Bank reports.

5. LAB STATUS: Shows patient specimen status in real time, so that the clinician can track the progress of the sample to and through the laboratory.

XI. COMPUTER DOWNTIME PROTOCOL:

Pathology & Laboratory Medicine Service does not have an independent computer system and is dependent solely on the hospital (VistA) mainframe computer. Therefore, any interruption in computer service significantly impacts the laboratory, as well as the other clinical services. Please refer to VANTHCS Memorandum No. 113-05, Laboratory Computer Downtime Procedure [viewable on VANTHCS Intranet] for detailed information.

A. For <u>scheduled</u> computer downtime, the following procedures must be followed.

1. One hour prior to downtime, all specimens submitted to the Client Services Unit (CSU) or the laboratories must be accompanied by a manual 5-part laboratory requisition that **includes the computer order number** as well as full patient name, full patient SSN, sex, priority, unit/clinic location, physician name, and pager. This enables the laboratory to know which unit/clinic is to receive the hardcopy results, as well as whom to notify in case a critical value is determined.

2. As much as possible, test requests are consolidated by specimen type (color of collection tube cap -- refer to the Lab Test Menu for Computer Downtime on the following page) during downtime. <u>A separate request slip must be completed for each sample tube if a manual 5-part laboratory requisition form is unavailable.</u> This is to ensure that no samples are mis-placed, or tests not run, since tests are routinely run in several different

Paper Copies are not Document Controlled

areas of the lab. A full color copy of the Downtime Menu should also be available in each ward/unit/clinic as part of that area's computer downtime protocol.

3. Medical Emergency and STAT orders will be handled with first priority during this time. The test urgency must be indicated on the requisition.

4. All Medical Emergency test results will be called to the nursing unit. All critical results are called as per the Critical Results Policy – VANTHCS Memorandum 11-14.

5. All ICU and ED results are faxed to the appropriate area upon completion. The ICUs and ED are responsible for identifying the fax number to be used, and for ensuring that the fax machines function properly. Other services may pick up test results from the Client Services Unit window of P&LMS. Additionally, P&LMS will provide delivery of test results during normal duty hours approximately every two hours as staffing allows.

6. Each ward/unit/area has one PC that is designated the **contingency PC.** Staff may access patient information using these specific PCs. Patient information is backed up daily, but updated lab results will not be received until the main computer system is back up. VistA-RO, a "Read Only" system is available via the Intranet webpage. VistA-RO contains the latest patient information prior to the downtime.

7. Telephone calls to the laboratory for test results should be limited to emergency needs only.

B. In the event of an un-scheduled computer downtime, the laboratory will immediately go into an emergency mode. This is characterized by the following:

1. All Medical Emergency test results are faxed to the nursing unit. All critical results are called as per the Critical Results Policy – VANTHCS Memorandum 11-14.

2. All routine testing already requested through the computer and in progress will continue to be processed but will not be reported by alternative means until the computer downtime has exceeded two hours.

3. Manual 7-part laboratory requisitions are required only after the downtime has exceeded one hour.

4. Only tests critical to patient care (Medical Emergency and STAT) are submitted, on the manual 7-part laboratory requisition form, during the first two hours of a downtime. If the computer downtime exceeds two hours, routine tests requests should be submitted. See XI.A.2. above.

5. Samples in transit to the laboratory at the time of downtime that bear only a computer order number cannot be processed until the computer returns to normal operation. If the requested tests are urgent, a manual 7-part laboratory requisition must be brought to the laboratory with the requested tests listed to process the sample.

6. For extended unscheduled downtime, Pathology & Laboratory Medicine Service will relay additional specific instructions to house staff and clinic/unit personnel.

C. Retroactive entry of laboratory test data produced during any computer downtime will be completed as soon as possible after the computer is functioning.

D. The WARD COLLECTION LIST ('WACL') option, which exists on all unit personnel menus, will provide the user a list of all WARD COLLECT orders placed for a given day. This ward collection summary **should be printed daily** by the ward and kept in an accessible area, so that it can be referred to in the event of an unscheduled downtime. As a backup option, the WARD COLLECTION SUMMARY LIST is also available to be printed for the same utility to the ward personnel.

Paper Copies are not Document Controlled

E. The FUTURE COLLECTION LIST will be printed (hardcopy or computer file copy) before each shift for use by the P&LMS Inpatient Collection Team in case of unexpected computer downtime. The FUTURE COLLECTION LIST will provide a list of all LAB COLLECT orders previously placed for that shift and can be referred to by the Inpatient Collection Team in the event of an unscheduled downtime.

Paper Copies are not Document Controlled

LABORATORY COMPUTER DOWNTIME FORM

COMPLETE ALL FIELDS BELOW PRIOR TO SUBMISSION TO P&LMS		
PATIENT LABEL OR WRITE/PRINT INFORMATION		
Last Name:	WARD:	Phone:
First Name:	MI:	Fax:
FULL SSN:	Requesting Clinician:	
DOB:	Clinician Signature:	
SEX:	Clinician Pager/Cell:	
PRIORITY		
☐ ROUTINE	☐ STAT	☐ MEDICAL EMERGENCY
COLLECTION INFORMATION		
Date:	Time:	COLLECTORS INITIALS:

LIGHT GREEN TOP	RED TOP	LAVENDER TOP	URINE CONTAINER
PANELS	*THERAPEUTIC DRUGS*	☐ Ammonia (ON ICE)	*SELECT URINE TYPE:*
☐ Basic Metabolic	☐ Acetaminophen	☐ BNP	☐ Random
☐ Comprehensive Metabolic	☐ Amikacin	☐ CBC w/Differential	☐ 24 H* Volume (mL)_____
☐ Hepatic	☐ Carbamazepine	☐ Reticulocyte	☐ Urinalysis w/ Microscopic
	☐ Digoxin		☐ Pregnancy Test
CHEMISTRIES	☐ Gentamicin		☐ Urine Drug Screen (Med Emerg)
☐ Amylase	☐ Lithium		
☐ CPK	☐ Phenobarbital	☐ Cell Count for Body Fluids Source:_____	*Toxicology Testing*
☐ Creatinine	☐ Phenytoin (Dilantin)		☐ Urine Drug Screen with:
☐ Lipase	☐ Salicylate		☐ Ethanol
☐ Magnesium	☐ Tobramycin		☐ Other
☐ Phosphorus	☐ Valproic Acid	Lavender Label#	
☐ Troponin	☐ Vancomycin	**Gold TOP**	
		☐ Cryptococcus Antigen	
LT Green Label #	Red Label #	☐ Pregnancy hCG (Serum)	
BODY FLUIDS	**PINK-TOP**		
CHEMISTRY	☐ Antibody Screen (7mL)	Serology Label#	Urine Label#
Source:	☐ DAT ☐ ABO/Rh	**MICROBIOLOGY**	
☐ Glucose		☐ C. Difficile Toxin PCR	☐ MRSA PCR
☐ LDH		☐ Blood Culture	
☐ Protein, Total	Pink Label#		☐ Aerobic Culture
	GRAY-TOP	*COVID-19*	Source:
BF Label#	☐ Ethanol (ETOH)	☐ Diagnostic	
BLUE-TOP	☐ Lactic Acid (ON ICE)	☐ Monitoring	
☐ D-Dimer		☐ Screening	☐ Anaerobic Culture
☐ Fibrinogen	Gray Label#		Source:
☐ PT w/INR	**DARK GREEN-TOP**		
☐ PTT	☐ Ionized Calcium (ON ICE)	Micro Label#	
Blue Label#	Green Label#		

FOR INTERNAL USE ONLY (PLMS)	
Parent Label:	
Lab Arrival Time:	Processor Initials:

Created Dec 2021

LIST OF TESTS
ORDERABLE AS "MEDICAL EMERGENCY" STATUS
24 HOURS-A-DAY
INCLUDES WEEKENDS AND HOLIDAYS

Acetaminophen
Alcohol
Alkaline phosphatase
ALT (SGPT)
Amylase
AST(SGOT)
Bilirubin, total
Blood components
BNP
BUN
Calcium
Carbamazepine

CBC
Cerebrospinal Fluid (CSF) – cell counts
Chloride
CK (Total)
CO_2
Creatinine
CRP
D-Dimer
Digoxin
Direct Bilirubin
ESR

Fibrinogen
Free T-4
Glucose
Hematocrit
Hemoglobin
Legionella
Lithium
LD
Magnesium
Manual Osmolality
Partial Thromboplastin time (PTT)
Phenobarbital
Phenytoin
Platelets
Procalcitonin
Pregnancy Test, qualitative
Prothrombin time (PT)
PTT- Heparin
Salicylate
Theophylline
Troponin (initial only)
TSH
Type and Screen (T&S), emergency transfusion
Urinalysis
Urine Antigen
Urine drug screen (Qualitative, during non-normal duty hours only)
Valproic Acid

The following panels are also available as Medical Emergency urgency and must be ordered only when all the analytes are medically needed:

- Basic Metabolic panel (sodium, potassium, chloride, bicarbonate, glucose, BUN, creatinine, calcium)
- Electrolytes panel (sodium, potassium, chloride, bicarbonate)
- Hepatic Function panel (total bilirubin, direct bilirubin, alkaline phosphatase, AST, ALT, total protein, and albumin)
- CBC without differential

To ensure that a one-hour turnaround time is possible for "Medical Emergency" requests, Laboratory Medicine Service asks that this priority be limited to a life-threatening situation in which an immediate or diagnostic decision is to be made upon a laboratory result.

Any test ordered as a Medical Emergency priority must be ordered WARD COLLECT and will not be honored on SEND PATIENT.

Medical Emergency test requests must be separate and unique for each order number. These requests require special handling and processing procedures to ensure timely results.

Paper Copies are not Document Controlled

VA NORTH TEXAS HEALTH CARE SYSTEM
CRITICAL LABORATORY RESULTS/VALUES

Critical values are those lab values, above or below the reference or therapeutic ranges, for which a laboratory-initiated phone call is necessary. These values are considered so abnormal that medical intervention is usually required; therefore, the authorized caregiver (ordering caregiver) must be called within one hour of test completion. Read back of results is required.

CHEMISTRY

SERUM ANALYTE	LESS THAN	GREATER THAN
Calcium (total)	6.9 mg/dL	13.0 mg/dL
Bicarbonate	10 mmol/L	40 mmol/L
Glucose	50 mg/dL	500 mg/dL
Magnesium	1.0 meq/L	3.3 mEq/L
Potassium	2.7 mmol/L	6.2 mmol/L
Sodium	120 mmol/L	160 mmol/L
Ionized Calcium	0.80 mmol/L	1.40 mmol/L

THERAPEUTIC DRUGS:		GREATER THAN:
Acetaminophen		35 µg/mL
Amikacin (Peak or Routine)		35 µg/mL
Amikacin (Trough)		10 µg/mL
Carbamazepine		20 µg/mL
Digoxin		2.5 ng/mL
Free Phenytoin		3 µg/mL
Gentamicin (Peak or Routine)		12 µg/mL
Gentamicin (Trough)		2.5 µg/mL
Lithium		1.5 mEq/L
Phenobarbital		60 µg/mL
Phenytoin (Dilantin)		30 µg/mL
Salicylate		300 mg/L
Tacrolimus		>20.0 ng/mL
Theophylline		25 µg/mL
Tobramycin (Peak or Routine)		12 µg/mL
Tobramycin (Trough)		2.5 µg/mL
Valproic Acid		170 µg/mL
Vancomycin (Trough)	10 µg/mL	25 µg/mL

Paper Copies are not Document Controlled

HEMATOLOGY

BLOOD ANALYTE	LESS THAN	GREATER THAN
Absolute neutrophils	0.2 K/µL (Inpatient) 0.5 K/µL (Outpatient)	
Hematocrit	21%	57%
Hemoglobin	7.0 g/dL	19 g/dL
Platelets	30 K/µL	1,000 K/µL
PT/INR (International Normalized Ratio)		INR >4.5
PTT & PTT-Heparin		≥100 seconds (Inpatient) ≥50 seconds (Outpatient)
Blood smear for malaria or other parasites		Critical if positive, especially *P. falciparum*

IMMUNOLOGY

Cryptococcal antigen (CSF)	Positive (Sample titered)
QuantiFERON TB Gold Plus	Positive

MICROBIOLOGY

Acid-fast bacteria (AFB) smear or culture	Positive
Any culture	Presence of highly unusual antimicrobial resistance detected (e.g., *Enterococcus sp.* and *Staphylococcus sp.* resistant to Vancomycin) Highly significant or unusual microorganisms (e.g., *Listeria, Legionella,* or *Brucella*) Gram stain suggesting gas gangrene or other systemic toxemia
Blood culture	Positive
CSF and other Sterile Body Fluid (Pleural, Peritoneal, and Synovial) Culture, Gram Stain, or preps	Positive
Surgical wound culture	Positive for *Streptococcus pyogenes* (Group A)
Stool *Clostridioides difficile* toxin B(PCR)	Positive for toxin B

ARTERIAL BLOOD GASES

	LESS THAN	GREATER THAN
pH	7.200	7.600
pCO_2	10 mm Hg	65 mm Hg
pO_2	40 mm Hg	
sO_2	70%	
HCO_3	10 mmol/L	40 mmol/L
O_2Hb %	70%	
CoHb %		15%
Lactate		>4.0 mmol/L
MetHb		>30%

Paper Copies are not Document Controlled

View Alerts: These are laboratory values that are not considered "critical" results and do not require verbal communication, but the abnormal value is significant enough that it justifies a notification. The abnormal value will flag in the computer as a "critical result" in order to alert the provider.

Positive fecal occult blood
MRSA
BNP
Legionella Urine Antigen
Urine Eosinophil (>5%)
CT/NG PCR Panel

VA NORTH TEXAS HEALTH CARE SYSTEM
"ALERT" LABORATORY VALUES

Alert values are those lab values, above or below the reference or therapeutic ranges, that are very abnormal, and notification of provider is appropriate. Notification will be made by telephone within four hours of test completion. Read back of results is required. The alert values below will "flag" in the computer as a "critical result" in order to alert the provider.

IMMUNOLOGY/MOLECULAR

SARS-CoV-2 PCR	Detected
VDRL (CSF)	Reactive (Sample titered)
Cryptococcal Antigen (Serum)	Positive (Sample titered)

MICROBIOLOGY

Eye Culture and Gram Stain Smear	Organism seen with gram stain description
Stool Culture	Enteric pathogen growth
Stool O&P exam	Ova & Parasite present
Urethral, Vaginal, and Penile discharge Gram stain	Intracellular gram-negative diplococci
Vaginal Culture (women of child-bearing age)	*Streptococcus agalactiae* (Group B), *Streptococcus pyogenes* (Group A), or *Neisseria gonorrhoeae*

Paper Copies are not Document Controlled

REFERENCE LABORATORY ALERT VALUES

Drug Monitoring

ANALYTE	REF. LAB	ALERT VALUE	Reference Range
Amitriptyline	Quest	>500 ng/mL	100-250 ng/mL
Clomipramine + Desmethylclomipramine	Quest	>800 mcg/L	200- 600 mcg/L
Clozapine	Quest	>1500 mcg/mL	See Laboratory Report
Cyclosporin A	UTSW	>700 ng/mL	Trough 100-400 ng/mL
Doxepin/Nordoxepin	Quest	>500 mcg/L	110-250 mcg/L
Fluoxetine + Norfluoxetine	Quest	>2000 mcg/L	300-1150 mcg/L
Gabapentin	Quest	>25 mcg/mL	The reference range is evolving. Seizure control has been observed at levels in excess of 4 mcg/mL
Lamotrigene	Quest	>20 mcg/mL	4.0-18.0 mcg/mL
Methotrexate	UTSW	≥ 0.5 mcmol/L (48 hours after high dose therapy)	
Nortriptyline	Quest	>500mcg/L	50-150 mcg/L
Procainamide	Quest	>16 mcg/mL	See Laboratory Report
Quinidine	Quest	>10 mg/L	2.0-5.0 mg/L
Sirolimus	UTSW	>25 ng/mL	4-20 ng/mL

Infectious Disease

ANALYTE	REF. LAB	ALERT VALUE	Reference Range
MTB-PCR (fluid)	Quest	Positive	Negative. States result is Critical on Report
CMV-PCR (fluid)	Quest	Positive	Negative
HSV – PCR (CSF)	Quest	>100 copies/mL	Not detected
Viral Culture (fluid, tissue)	Quest	Positive	No virus isolated
Zika Virus	Quest	Positive	Negative
P. jirovecii, PCR (fluid)	Quest	Positive	Negative. States result is Critical on Report
Rickettsia Antibody	Quest	Positive	Negative

Not Otherwise Specified

ANALYTE	REF. LAB	ALERT VALUE	Reference Range
Aluminum (serum)	Quest	>100 mcg/L	<7 mcg/L or <40 mcg/L (Dialysis patient)
Beta-2 Transferrin (fluid)	Quest	Positive	Negative
Factor VIII	UTSW	<50%	50-150%

Paper Copies are not Document Controlled

CEREBROSPINAL FLUID AND OTHER BODY FLUIDS

I. CEREBROSPINAL FLUID (CSF):

Analysis of CSF is performed by various sections of the laboratory; therefore, it is necessary that separate tubes of spinal fluid be submitted for each area. All tests, except cytology, are ordered through the computer.

A. Chemistry Tests

Protein content and glucose is measured on clear spinal fluids.

B. Hematology: Cell count and differential

At least 1 mL of sample should be submitted in a sterile spinal tap tube within 30 minutes of collection. Routinely, tube #4 (or the last tube) is used for cell counts because it has the least peripheral blood contamination after a traumatic puncture.

C. Microbiology: Culture

A separate tube containing at least 2 mL of the spinal fluid should be submitted to the Microbiology Laboratory. Print the order label and record the date, time, and collector's initial on the order label. **NOTE: Always send the most turbid tube to Microbiology.**

D. Immunology: VDRL and Cryptococcal Antigen

VDRL is performed on clear spinal fluids (a bloody CSF will yield unreliable results). A volume of 0.5 mL is needed to perform both VDRL and Cryptococcal Antigen tests.

An order for bacterial culture must also accompany initial test orders for Cryptococal Antigen on CSF.

E. Cytology

Cytologic examination for malignant cells can be performed. A fully completed tissue examination request form (SF-515) must accompany the sample. The specimen should be received fresh. The laboratory will keep the specimen refrigerated until processing by a cytotechnologist or histopathology technician.

II. OTHER BODY FLUIDS:

Paracentesis fluids (pleural, abdominal, pericardial, etc.):

A. **CHEMISTRY** (glucose, protein, LDH, etc.) Submit at least 2 mL of fluid in a red top tube. There are no established reference ranges for body fluids. Physician interpretation should be based on a comparison with serum values.

B. **HEMATOLOGY** (cell count and differential) - Submit in a lavender top (EDTA) tube within 30 minutes of aspiration. Clotted samples will yield erroneous data. If clotted, only a differential is resulted with a comment for the RBC and WBC counts.

C. **MICROBIOLOGY** (smears and cultures) - Submit in a sterile capped syringe (**NO NEEDLE**). Print the order label and record the date, time, and collector's initial on the order label.

D. **Flow Cytometry** (evaluation of lymphocyte subsets) - Extent of fluid sample analysis is determined by the cellularity of the sample. Submit the fluid in a sterile tube or yellow top (ACD) tube to the laboratory immediately. Contact the Flow Cytometry laboratory prior to obtaining these samples to ensure the specimen will be handled appropriately. Contact the Flow Cytometry staff (Ext: 70268), the clinical pathologist on call (Ext. 70669), or the pathology resident on the surgical pathology rotation (214-759-3341).

Paper Copies are not Document Controlled

E. **CYTOLOGY** (including cell block) – For samples <50 mL, the specimen is fixed with an equal amount of cytology fixative (containers of Cytolyt are available on the units, clinics, and from Supply Chain Management Services, SCMS, located in the basement of Building 2J). All specimens must be sent promptly to the Cytology Laboratory with a fully completed tissue examination request form (SF-515).

For large volume collections, send the entire sample (bag, vacuum bottles, 250 cc syringe, etc.) for centrifugation/concentration.

III. SYNOVIAL FLUIDS:

Synovial fluids should be placed in the proper container according to the tests desired.

A. Synovial fluid chemistries - red top tube.

B. Cell count and differential - lavender top tube (EDTA).

C. Smear and gram stain for bacteria - sterile container (sterile syringe preferred), submitted with the order number recorded on the patient sample label.

D. Culture and susceptibility - sterile container (sterile capped syringe preferred), submitted with the order number recorded on the patient sample label.

E. Synovial fluid crystals - red top tube (not SST).

F. Cytology - Send separate fresh specimen, mixed with an equal amount of cytology fixative (containers of Cytolyt are available on the units, clinics, and from SCMS) to the laboratory promptly, along with a fully completed tissue examination request form SF-515.

Paper Copies are not Document Controlled

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
ABG PANEL-POC ABG OR Panel-POC	Ancillary Testing, Respiratory Blood Gas labs OR Stat lab	safePICO Aspirator (line draw) safePICO Syrine Self-Fill Heparnized Blood Gas Syringe (arterial puncture) safePICO Syringe Self-Fill Heparinized Blood Gas Syringe (arterial puncture)		pH: Arterial 7.350-7.450 Venous 7.310-7.410 pCO2: Arterial 35-45 Venous 40-52 pO2: Arterial 90-100 Venous 30-50 sO2: Arterial 95-100 Venous 60-85 COHb: Arterial or Venous 0.0-1.9 Nonsmokers: <3 Smokers: 1-2 packs/day 4-5 >2 packs/day 8-10 HCO3: Arterial 22-26 Venous 22-28 O2Hb: Arterial 96-100 Venous 60-85 tHb: Arterial or Venous Females 11.5-15.3 Males 13.0-17.3 Base Excess (ABE): Arterial or Venous -3-+3 Potassium Arterial or Venous 3.3-5.1 Sodium Arterial or Venous 133-145 Chloride Arterial or Venous 96-108 Glucose Arterial or Venous 70-99 Ionized Calcium Arterial or Venous 1.15-1.29 $_c$Lac Arterial 0.4-1.3 Venous 0.9-1.7 MetHb Arterial and Venous, Male/Female <1.0	mm Hg mm Hg % % mmol/L % g/dL mmol/L mmol/L mmol/L mmol/L mg/dLmmol/L mmol/L % %	15 min

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
ABO/RH TYPING	Transfusion Medicine	Blood/LLT, Pink top	May be ordered in CPRS. Part of Type and Screen (OR). May be ordered separately as diagnostic test.	N/A		<1 hr
ACETAMINOPHEN (TYLENOL)	Chemistry	Blood/RT	Method: IMMUNOTURBIDIMETRIC	Therapeutic: 5-20 Toxic: ≥200	µg/mL	1 hr (Med Emerg)
Activated Clotting Time (ACT)	Ancillary Testing (Anesthesia, Cardiac Cath, EP lab)	Plastic non-heparinzed syringe		ACT LR: 89-169 ACT+: 96-152	Seconds	Immed
AFB BLOOD CULTURE	Microbiology	Myco F Lytic bottles	Contact laboratory prior to collection at extension 70666	No growth		6 weeks
AFB CULTURE	Microbiology	Sputum, urine, sterile body fluid/ STR	Early morning sputum preferred. 5-10 mL volume required. . One (1) specimen every eight (8) hours	No Mycobacteria isolated		6wks
AFB SMEAR	Microbiology	Sputum, urine, sterile body fluid/ STR	Early morning sputum preferred. 5-10 mL volume required. . One (1) specimen every eight (8) hours	No AFB observed		24 hr
ALBUMIN (also see MICROALBUMIN)	Chemistry	Blood/LLGT, SST or RT Urine - See PROTEIN ELECTROPHORESIS	Method: Digital endpoint methodology using Bromocresol Purple	3.0-5.0	g/dL	4 hr
ALCOHOL- See ETHANOL						
ALKALINE PHOSPHATASE	Chemistry	Blood/LLGT, SST, RT,	Method: P-NITROPHENYL PHOSPHATE	40-129	U/L	4 hr
ALPHA-FETOPROTEIN (AFP)	Chemistry	Blood/RT, SST	Method: CHEMILUMINESCENCE Test run Mon-Sat.	0.0-9.0	ng/mL	1-2 days
ALPHA-1 ANTITRYPSIN (AAT)	Client Services	Blood/RT	Referral Test.			
ALT (SGPT)	Chemistry	Blood/LLGT, SST, RT	Method: UV w/o P5P	M 5-58 F 5-45	U/L	4 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
AMIKACIN	Chemistry	Blood/RT	PEAK: collect sample 30 minutes after IV infusion. TROUGH: collect sample 0-30 minutes prior to next dose. Method: IMMUNOTURBIDIMETRIC	Therapeutic range: Trough 5-10 Peak 20-25	µg/mL	4 hr
AMINOPHYLLINE (See THEOPHYLLINE)						
AMMONIA (NH3)	Chemistry	Blood/SLT	METHOD: GLDH Place sample on ice, deliver to lab immediately-within 30 minutes. HEMOLYZED specimens are unacceptable for analysis.	10-47	µmol/L	2 hr
AMPHETAMINE SCREEN	Toxicology/P&LMS Bonham	Urine/UR	See DRUG SCREEN	Negative		8 hr
AMYLASE	Chemistry	Blood/LLGT, SST, RT	Method: Enzymatic-Glucosidase	Serum: 28-100 Fluid: None	U/L	4 hr
ANTI-NUCLEAR ANTIBODY [ANA PANEL (NTX)]	Immunology	Blood/RT	Method Immunofluorescence. Positive specimens are reflexed to ENA6 panel and dsDNA. Positive ENA6 specimens are relexed to Anti-Sm, Anti-RNP, Jo-1, Scl-70, SS-A, SS-B.	Negative		7 days
ANTI-NEUTROPHIL CYTOPLASMIC ANTI [ANCA SCREEN (NTX)]	Immunology	Blood/RT	Method Immunofluorescence. Positive specimens are reflexed to ANCA Vasculitides antibody (MPO, PR3)	Negative		7 days
ANAEROBIC CULTURE	Microbiology	Syringe w/aspirate, Tissue	Refer to Microbiology section of this manual for collection guidelines.	No Growth		7 days
ANGIOTENSIN CONVERTING ENZYME (ACE-1)	Client Services	Blood/RT	Referral Test.			

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
ANTIBODY SCREEN (ABS)	Transfusion Medicine	Blood/LLT, Pink Top	Orders: -Blood Bank Transfusion orders -Other tests: Diagnostic Tests (from drop down box select 'Antibody Screen'). See Transfusion Medicine Section of this document.	Negative		1-4 hr
ANTITHROMBIN III (AT-III)	Client Services	Blood/CBT	Referral Test.			
ANTI-Xa (LMW-HEPARIN & UFH)	Client Services	Blood/CBT	Referral Test. .			
Arthropods (ticks, mites, and other medically important arthropods (including Bed Bugs)	Microbiology-Parasitology	Dry, rigid container with screw-top lid	Plastic bag is unacceptable for collection and transport			1-2 days
ASO (ANTI-STREPTOLYSIN O)	Client Services	Blood/RT	Referral Test. .			
ASPERGILLUS ANTIBODY	Client Services	Blood/RT	Referral test.			
AST (SGOT)	Chemistry	Blood/LLGT, SST, RT	Method: UV w/o P5P	Male: 15-41 Female: 15-41	U/L	4 hr
AUTOPSY	Anatomic Pathology		Order via SF523. Must be signed and witnessed. Refer to VANTHCS Policy 11-15: Post Mortem Examination.			30-60 days
BARBITURATE SCREEN	Toxicology/P&LMS Bonham	Urine/UR	See "Drug Screen"	Negative		8 hr
BASIC METABOLIC PANEL	Chemistry	Blood/LLGT, SST, RT	Panel includes Sodium (Na), Potassium (K), Chloride (Cl), Carbon Dioxide (CO2), Glucose, Creatinine, Blood Urea Nitrogen (BUN), and Calcium (Ca)	Na: 133-145 K: 3.3-5.1 Cl: 96-108 CO2: 22-30 Glucose: 70-99 Creatinine: Male: 0.6-1.4 Female: 0.5-1.1 BUN: 6-20 Ca: 8.4-10.3	mmol/L mmol/L mmol/L mmol/L mg/dL mg/dL mg/dL mg/dL	4 hr
BCR/ABL p210	Molecular	Blood/LLT	Panel includes: & of Total ABL1, and Molecular Response	Negative		3 days

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
BENCE JONES PROTEIN (UPEP)	Chemistry	Urine/24 hr	Method: ELECTROPHORESIS	Negative		7 days
BENZODIAZEPINE SCREEN	Toxicology/P&LMS Bonham	Urine /UR	See 'Drug Screen'	Negative		8 hr
BETA 2 MICROGLOBULIN (SERUM)	Client Services	Blood/RT, SST	Referral Test. .			
BILIRUBIN, DIRECT	Chemistry	Blood/LLGT, SST, RT	Method: ENDPOINT DIAZO Protect sample from light.	0.0-0.3	mg/dL	4 hr
BILIRUBIN, TOTAL (T BIL; TOT. BILI.)	Chemistry	Blood/LLGT, SST, RT	Method: DIAZOTIZATION Protect sample from light.	0.1-1.2	mg/dL	4 hr
BINAXNOW COVID-19 AG CARD-POC		Nasal Swab		Negative		Immed
BLASTOMYCES ANTIBODY	Client Services	Blood/RT	Referral test. .			
BLOOD CULTURE (BACTERIAL) AER/ANA	Microbiology	Blood Culture Bottles	Refer to Microbiology section of this manual for specific collection guidelines.	No Growth		5 days
BLOOD CULTURE IDENTIFICATION (BCID)	Microbiology	Positive Blood Cultures Bottles	This test does not require an additional Blood Culture to be collected. It is a reflex test when the Blood Culture becomes positive.	None Detected	N/A	2-4 hours
BNP (Brain Natriuretic Peptide)	Chemistry	Plasma/Pink Top	Method: CHEMILUMINESCENCE Sample must be analyzed within 7 hours of collection.	0-100	pg/mL	4 hr
BUN	Chemistry	Blood/LLGT, SST, RT Urine/24 hur or random	Method: CONDUCTIVITY Urine method: UREASE UV	Serum/Plasma:6-20 Urine: 6-17	mg/dL g/24hr	4 hr
BUPRENORPHINE SCREEN	Toxicology	Urine/UR	Method: IMMUNOASSAY Included in: DAUGOLD and DAU-OMT panels. Not included in routine Drug Screen.	Negative		8 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
C-REACTIVE PROTEIN (CRP) [See hCRP for high-sensitivity CRP]	Chemistry	Blood/LLGT, SST, RT	Method: IMMUNOTURBIDIMETRIC	0.0 -0.9	mg/dL	4 hr
CA 19-9 ANTIGEN (Pancreatic Tumor Antigen)	Client Services	Blood/RT	Referral Test.			
CALCIUM, TOTAL	Chemistry	Blood/LLGT, SST, RT Urine 24 hour or random	Method: ISE Indirect	Serum/Plasma: 8.4-10.3 Urine: 100-300	mg/dL mg/24hr	4 hr
CALCIUM, IONIZED		GN/T (Na Heparin) Blood 5ml	Method: POTENTIOMETRIC Blood must be placed on ice and delivered to lab immediately after collection.	1.15-1.29 <0.56 mmol/L for post dialysis filter samples	mmol/L	1-3 hr
CANNABINOID SCREEN	Toxicology/P&LMS Bonham	Urine/UR	Refer to 'DRUG SCREEN'	Negative		8 hr
CARBAMAZEPINE (Tegretol)	Chemistry	Blood/RT	Method: IMMUNOTURBIDIMETRIC	Therapeutic Range 4-12	ug/mL	4 hr
CARBA-R	Microbiology	Bacterial Isolate or,Rectal Swab	Method: PCR	None Detected	N/A	2 hr
CARBON DIOXIDE (CO2)	Chemistry	Blood/LLGT, SST, RT	Method: ISE Indirect	22-30	mmol/L	4 hr
CARCINOEMBRYONIC ANTIGEN (CEA)	Chemistry	Blood/RT, SST	Method: CHEMILUMINESCENCE Test run Mon thru Sat.	Non-smokers 0-3.0 Smokers 0.0-5.0 Age 20-69 yrs	ng/mL	1-2 days
CATECHOLAMINES (fractionated, epinephrine and norepinephrine)	Client Services	Plasma Urine - 24 hr Contact Client Services for container	Referral test.			

Paper C

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
CBC/DIFF	Hematology	Blood/SLT	Blood must be mixed gently immediately after collection. CLOTTED or HEMOLYZED specimens are unacceptable. *-Calculated values	WBC 4.0–11.0 RBC: •Male: 4.30–5.80 •Female 3.80-5.30 Hemoglobin: •Male: 13.0–17.3 •Female 11.5–15.3 *Hematocrit: •Male 38.0–52.0 •Female 34.0-45.0 *MCV: 80.0-98.0 *MCH: 27.0-34.0 *MCHC: 31.5-37.5 RDW-CV 11.0-16.0 PLATELET: 140-400 MPV: 8.0-13.0 DIFFERENTIAL: - Neutrophils: 37.0-80.0% 1.6-7.7 K/µL - Bands: 0-9% - Eosinophils: 0.0-6.0% 0.0-0.7 K/µL - Basophils: 0.0-2.0% 0.0-0.3 K/µL - Monocytes: 1.0-13.0% 0.1-1.0 K/µL - Lymphocytes: 20.0-45.0% 1.0-4.5 K/µL Immature Granulocytes 0.0-2.0% 0-0.3 K/µL	K/µL M/µL g/dL percent fL pg g/dL percent K/µL fL	4 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
Cath-MB Panel (Cath CPK, Cath MB, Cath R Index)	Chemistry	Blood/SST, LLGT, RT	Method: CK fraction: ENZYMATIC CK-MB fraction: CHEMILUMINESCENCE	CK: Male 24-195 Female 24-170 CK-MB: 0.6-6.3	µ/L ng/mL	2 hr
CCP AB IgG(NTX)	Immunology	Blood/RT	Method: CHEMILUMINESCENCE	<5.00 Negative	U/mL	8 hrs
CD4/CD8 PANEL	Flow Cytometry	Blood/SLT	Method: FLOW CYTOMETRY Collect SLT and order CBC at same time. Test run M-F.	CD4: 30-68% 320-1960 cu mm CD8: 9-45%; 116-1224 cu mm HELPER/SUPPRESSOR RATIO: 0.8 – 3.1		24 hr
CELL COUNT, FLUID	Hematology	CSF/Black screw top Pleural Fluid/SLT Peritoneal Fluid/SLT Synovial Fluid/SLT Pericardial Fluid /SLT	Method: HEMACYTOMETER/IRIS Automation **Clotted specimens are unacceptable.**	Fluid WBC RBC CSF 0-5 0 Pleur. <1000 <10,000 Perit <500 <10,000 Synov <200 0 Pericard <1000	#/µL	4 hr
CERULOPLASMIN (CER)	Client Services	Blood/SST, RT	Referral test.			
CHLAMYDIA, CT/GC PCR PANEL	Molecular	Cervical, Rectal, Pharyngeal-Collection kit supplied by Client Services Urine-UR. Collect first 20-50 mL of urine directly into urine collection cup. Patient should not have cleaned genitalia or urinated for at least one hour prior to collection. Send sample to laboratory ASAP after collection.		Not Detected		2-3 days
CHLORIDE	Chemistry	Blood/LLGT, SST, RT Urine-24 hr or random	Method: ISE Indirect	Serum/plasma: 96-108 Urine: 110-250	mmol/L mmol/ 24 hr	4 hr
CHOLESTEROL, TOTAL	Chemistry	Blood/LLGT, SST, RT,	**Fasting** specimen requested. Method: Cholesterol oxidase, esterase, peroxidase	100-200 (Refer to Tables 1-4, pp. Y-Z)	mg/dL	4 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
CK, MB (BIOSITE)	FWOPC, Bonham, CSU	Blood/Pink top	Fluorescent immunoassay	0-10	ng/mL	2 hr
CK, TOTAL	Chemistry	Blood/LLGT, SST, RT	Method: ENZYMATIC	Male: 24-195 Female: 24-170	U/L	4 hr
CK, TOTAL + MB FRACTION (CK-MB)	Chemistry	Blood/LLGT, SST, RT	Method: CHEMILUMINESCENCE 1) Order as CK-TOTAL + MB. 2) CK-MB not performed when TOTAL CK ≤100 U/L. 3) RELATIVE INDEX (RI) not calculated if CK-MB ≤6.4 ng/mL	0.6-6.3 [Refer to interpretive chart at end of test menu]	ng/mL	4 hr
CK-MB (stat)	Chemistry	Blood/LLGT, SST, RT	Method: CHEMILUMINESCENCE	0.6-6.3	ng/mL	2 hr
CLOSTRIDIOIDES DIFFICILE ANTIGEN	Microbiology	Loose, watery stool	This test is a reflect test that is ordered only when Cdiff Toxin B PCR is positive	Negative		24 hr
CLOSTRIDIOIDES DIFFICILE TOXIN B (PCR)	Microbiology	Loose, watery stool/PLP	Submit one (1) specimen per week. Repeat testing of negative or positive samples will be performed after 7 days. There should be no tests done to determine "cure" of CDI before transferring the patient to another facility.	Negative		1 day
COCAINE SCREEN	Toxicology/P&LMS Bonham	Urine/UR	See DRUG SCREEN	Negative		8 hr
COCCIDIOIDES ANTIBODY (IgG, IgM)	Client Services	Blood/RT	Referral test.	Negative		
COMPLEMENT C3	Chemistry	Blood/SST, RT	Method: IMMUNOTURBIDIMETRIC Test run Mon & Thurs	90-180	mg/dL	24 hr
COMPLEMENT C4	Chemistry	Blood/SST, RT	Method: IMMUNOTURBIDIMETRIC Test run Mon & Thur	12.7-49.1	mg/dL	24 hr
COMPONENT ORDER Red Blood Cell	Transfusion Medicine	None unless No Current T&S	Must be accompanied by SF-518 Request form.	Compatible		1-4 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
COMPREHENSIVE METABOLIC PANEL	Chemistry	Blood/LLGT, SST, RT	Panel includes: SODIUM (Na), POTASSIUM (K), CHLORIDE (Cl), CO2, GLUCOSE, CREATININE, BLOOD UREA NITROGEN (BUN), CALCIUM (Ca), TOTAL BILIRUBIN (T-BILI), ALKALINE PHOSPHATASE, TOTAL PROTEIN (T-PROT), AST, ALT, ALBUMIN (ALB)	Na: 133-145 K: 3.3-5.1 Cl: 96-108 CO2: 22-30 Glucose: 70-99 Creatinine: - Male: 0.6-1.4 - Female: 0.5-1.1 BUN: 6-20 Calcium: 8.4-10.3 T. Bili: 0.1-1.2 Alk Phos 40-129 T. Protein:6.1-8.2 AST: 15-41 ALT -Male 5-58 -Female 5-45 ALBUMIN: 3.0-5.0	mmol/L mmol/L mmol/L mmol/L mg/dL mg/dL mg/dL mg/dL mg/dL U/L g/dL U/L U/L g/dL	4 hr
CORTISOL	Chemistry	Blood/RT, SST	Method: CHEMILUMINESCENCE	A.M.: 6.7-22.6 P.M.: 3.0-10.0	µg/dL	24 hr
COVID-19 PCR	Molecular	See SARS-CoV-2 PCR				
COVID SARS PCR (Cepheid)		See SARS-CoV-2 PCR				
SARS COVID/FLU/RSV (Cepheid)	Microbiology	Naspharyngeal	Polymerase Chain reaction (PCR)	Negative	N/a	2 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
CREATININE (CREAT)	Chemistry	Blood/LLGT, SST, RT Urine-24 hr	Method: Alkaline-Picrate-kinetic/Jaffe' rate method	Serum or Plasma: Male: 0.6-1.4 Female: 0.5-1.1 Urine: Male: 0.8-2.0 Female: 0.6-1.8	mg/dL g/24hr	4 hr
CREATININE-POC	Ancillary	Blood/LLGT			mg/dL	≤ 30 min
eGFR-POC	Radiology (MRI, CAT)			>60	mL/min	
CREATININE – TOXICOLOGY	Toxicology	Urine/UR	Included in URINE ADULTERATION PANEL. Values <20 often indicate diluted urine.	Abnormal Range: <20	mg/dL	8 hr
CRYOGLOBULINS	Chemistry	Blood/RT	Send to the Laboratory in a container of **warm** water (37°C) immediately after collection.	Negative		3-4 days
CRYPTOCOCCAL ANTIGEN	Immunology	Blood/RT CSF/Black screw top	Method:Lateral Flow Assay . M-F for serum, 7 days a week for CSF Positive test results are titered.	Negative		1-2 days
CRYPTOSPORIDIUM EXAM	Client Services	Stool	Referral test.			
CRYSTALS	Chemistry	Synovial Fluid/RT	Method: POLARIZATION MICROSCOPY Performed immediately upon receipt in Laboratory.	Negative		1-2 hr
CSF VDRL	Immunology	CSF/Black screw top	M-F Positive test results are titered.	Nonreactive		4 hr
CULTURE (BACTERIAL)	Microbiology		Refer to Microbiology Section, this manual, for specific collection guidelines.			2-7 days
CYCLOSPORIN A	Client Services	Blood/SLT	Referral Test.			

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
CYTOLOGY	Cytology	1. Bladder wash, bronchial wash, BAL/Cytolyte Collection Fluid-120 mL container 2. Body Fluid (pleural, CSF, peritoneal, pericardial, cyst), 3. FNA/Coplin jar with 95% Ethanol, 60 mL Formalin container 4. Cervical Cancer Screen/20 mL Thin Prep collection "vial"	Containers for body fluids vary from a syringe (120 mL) to a larger collection container (3000 mL)			2 days, approx.
D-DIMER	Hematology	Blood/CBT	Method: IMMUNOTURBIDIMETRIC Tube must be drawn to capacity.	0-243	ng/mL D-Du	4 hr
DIFFERENTIAL COUNT	Hematology	Blood/SLT	See CBC			
DIGOXIN	Chemistry	Blood/RT	Method: IMMUNOTURBIDIMETRIC Sample should be collected 6-8 hours after an ORAL or IV dose.	Therapeutic Range: 0.8-2.0	ng/mL	4 hr
DILANTIN (PHENYTOIN)	Chemistry	Blood/RT	Method: IMMUNOTURBIDIMETRIC	Therapeutic Range: 10-20	µg/mL	4 hr
DIRECT ANTIGLOBULIN TEST (DAT)	Transfusion Medicine	Blood/LLT, Pink Top	Order Direct Antiglobulin Test in CPRS, Blood Bank Orders, Other tests, Diagnostic test drop down, select Direct Antiglobulin Test	Negative		1 hr
DRUG SCREEN	Toxicology/P&LMS Bonham	Urine/UR	Performed during normal duty hours, M-F, 8 a.m.- 4 p.m. Method: IMMUNOASSAY. Screen includes: Amphetamines, Barbiturates, Benzodiazepines, Cannabinoids, Cocaine, Opiates, Methadone, and Phencyclidine (PCP). Confirmation must be REQUESTED. Positive PCP and Amphetamines will be confirmed by gas chromatography/mass spectrometry before results are released.	Negative		8 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
DRUG SCREEN-EMERGENCY	Urinalysis	Urine/UR	Performed after normal duty hours, on weekends, and holidays. Method: COLLODIAL GOLD Screen includes: Amphetamines, Barbiturates, Benzodiazepines, Cannabinoids, Cocaine, Opiates, Tricyclics, and Phencyclidine (PCP). Results are presumptive and for medical use only. Confirmation must be REQUESTED by the provider.	Negative		1 hr
E. COLI 0157:H7	Microbiology	Stool/Sterile leak-proof screw cap cup	Refer to Microbiology Section, this manual, for specific collection guidelines.	Negative		2-3 days
ELECTROLYTES, BLOOD	Chemistry	Blood/LLGT, SST, RT	INCLUDES: Na, K, CL, CO_2. For Methodology, see individual tests.	See BASIC METABOLIC PANEL for Ref. Ranges		4 hr
ELECTROLYTES, URINE	Chemistry	Urine (24 hr) Urine/UR (Random)	Panel contains: Na, K, Cl (No Reference Range for **random** urine collection sample)	24-hr Random Na: 40-220 None K: 25-125 None Cl: 110-250 None	mmol/24 hr	4 hr
ESR (ERYTHROCYTE SEDIMENTATION RATE) (See SEDIMENTATION RATE)						
ESTRADIOL SENSITIVE	Chemistry	Blood/RT, SST	Method: CHEMILUMINESCENCE Hemolyzed sample unacceptable Test run Mon thru Sat	M: <31.5 F: Early Follicular: 22.4-115.0 Mid Follicular: 25.0-115.0 Ovulatory Peal: 32.1-517.0 Mid Luteal: 36.5-246.0	pg/mL	1-3 days
ETHANOL (ETOH; ETHYL ALCOHOL,)	Chemistry	Blood/RT, SGRT	Method: Enzymatic UV Clinical intoxication level = 80 mg/dL (0.08 gm percent) Collect specimen using **alcohol-free** disinfectant.	Negative Instrument sensitivity is <5. Results less than 5 are reported <5	mg/dL	4 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
ETHANOL SCREEN	Toxicology/P&LMS Bonham	Urine/UR	Included in: DAU-RE, DAU-P-E, DAUGOLD, DAU OMT, and DAU-BON panels. URINE GLUCOSE test is also performed on all positive alcohol results.	Lower limit is 25	mg/dL	8 hr
FACTOR ASSAYS	Client Services	Blood/two (2) CBT	Referral Test.			
FECAL FAT (QUALITATIVE)	Client Services	Stool/PLP	Referral Test. Signed authorization by a staff physician required.			
FECAL LACTOFERRIN	Microbiology	Stool/PLP		Negative		1 day after received into the laboratory.
FECAL OCCULT BLOOD	Microbiology	Stool/PLP	iFOBT (submitted by mail) performed M-F Stat request performed daily.	Negative		24 hr
FECAL OCCULT BLOOD-(PROVIDER PERFORMED	EMERGENCY DEPT	Stool	Guiac-based slide test	Negative		Immed.
FENTANYL SCREEN	Toxicology	Urine/UR	Included in: DAU OMT	Negative		
FERRITIN	Chemistry	Blood/SST, RT	Method: CHEMILUMINESCENCE Hemolyzed sample unacceptable Test run Mon thru Sat	Male: 23.9-336.2 Female: 11-306.8	ng/mL	1-3 days
FIBRINOGEN	Hematology	Blood/CBT	Method: CLAUSS Draw tube to full capacity (a 9:1 blood:anticoagulant ratio must be maintained.)	200-393	mg/dL	4 hr
FOLATE, SERUM	Chemistry	Blood/RT, SST	Method: CHEMILUMINESCENCE Hemolyzed sample unacceptable Test run Mon - Sat	5.9-24.8 Deficient <4.0 Indeterminate: 4.0-5.8	ng/mL	1-3 days

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
FREE TRIIODOTHYRONINE (T3 Total)	Chemistry	Blood/SST, RT	Method: CHEMILUMINESCENCE Test performed Mon - Sat	2.50-3.90	pg/mL	1-2 days
FREE THYROXINE (FT4)	Chemistry	Blood/SST, RT	Method: CHEMILUMINESCENCE Test performed Mon - Sat	0.6-1.60	ng/dL	1-2 days
FSH (FOLLICLE STIMULATING HORMONE)	Chemistry	Blood/RT, SST	Method: CHEMILUMINESCENCE Test performed Mon thru Sat.	Male: 1.3-19.3 Females: -Follicular phase 3.9-8.8 - Ovulatory phase 4.5-22.5 - Luteal phase 1.8-5.1 - Post-menopause 16.7-113.6	mIU/mL	1-2 days
FUNGAL ANTIBODIES	Client Services	Blood/RT	Referral test.			
FUNGAL BLOOD CULTURE	Microbiology	Myco F Lytic Bottle	Contact laboratory prior to collection at 70666	No growth		4 weeks
FUNGITELL STAT	Immunology	Blood/SST	Indeterminate and Positive results reflexed to quantitative analysis at reference lab	Negative		3 days
G-6-PD (SCREEN)	Client Services	Blood/SLT	Referral Test. .			
GAMMA GLOBULIN	Chemistry		See PROTEIN ELECTROPHORESIS			
GAMMA-GTP (GGT, GGTP, GT, or GTP)	Chemistry	Blood/LLGT, SST, RT,	Method: G-GLUTAMYL-P-NITROANILIDE	7-50	U/L	4 hr
GC (GONORRHEA) CULTURE	Microbiology	Anal, cervical, urethral, vaginal, throat/Swab transport system		Negative		2-3 days

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
GC (GONORRHEA) CT/GC PCR PANEL	Molecular	Cervical, Rectal, and Pharyngeal-Collection kit supplied by Client Services. Urine-UR. Collect first 20-50 mL of urine directly into urine collection cup. Patient should not have urinated for at least one hour prior to collection. Send sample to laboratory ASAP after collection.		Not Detected		2-3 days
GENTAMICIN	Chemistry	Blood/RT	Method: IMMUNOTURBIDIMETRIC Refer to Quick Guide, end of yellow pages section. Heparin sample **cannot** be used. Collect TROUGH levels 10-30 minutes prior to next dose. Collect PEAK levels 30 minutes after IV infusion.	Trough: <2 Peak: 5-10	µg/mL	4 hr

Paper Copie
Con

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
GLOMERULAR FILTRATION RATE (GFR)	Nuclear Medicine		Method: Radioassayl	All result should be within 2SD of mean for age: **MEN:** AGE Mean SD 20-29 128 25.6 30-39 116 23.2 40-49 105 21 50-59 93 18.6 60-69 81 16.2 70-79 70 14 80-89 58 11.6 **WOMEN:** AGE Mean SD 20-29 118 23.6 30-39 107 21.3 40-49 97 19.3 50-59 86 17.1 60-69 75 14.9 70-79 64 12.9 80-89 53 10.7		Immed.
GLUCOSE	Chemistry	Blood/LLGT, SST, RT, SGRT Urine-24 hr or random CSF	Method: GLUCOSE OXIDASE/OXYGEN CONSUMPTION If delayed delivery to Laboratory is anticipated, collect specimen in GREY TOP or separate serum within 1 hr.	Serum/Plasma: 70-99 Urine: 0-250 CSF: 40-70 mg/dL Fluids: None	mg/dL mg/24 hrs	4 hr
GLUCOSE	Ancillary Testing: Dallas, Bonham, FWOPC, Garland, Grand Prairie, Plano, Polk, Tyler and other CBOC's/	Capillary whole blood obtained by fingerstick, venous or arterial blood.		70-99	mg/dL	Immed.

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
GLUCOSE-6-PHOSPHATE DEHYDROGENASE (See G-6-PD)	Client Services	Blood/SLT	Referral test.			
GLUCOSE TOLERANCE TEST	Chemistry	Gray top	Contact Client Services for instructions (70666).	2 Hr. PP <140	mg/dL	1 day
GRAM STAIN	Microbiology		See Microbiology Section STATs performed on sterile fluids and surgical site specimens after hours			1 day
H&H PLATELET, WBC PANEL	Hematology	Blood/SLT	See CBC			
HAPTOGLOBIN	Chemistry	Blood/RT	Method: IMMUNOTURBIDIMETRIC	30-200	mg/dL	24 hr
HAV IGM (HEPATITIS A VIRAL IgM ANTIBODY)	Immunology	Blood/LRT	Method: CHEMILUMINESCENCE	Nonreactive		1 ½ days
HAV IGG (HEPATITIS A VIRAL Ig G ANTIBODY)	Immunology	Blood/LRT	Method: CHEMILUMINESCENCE	Nonreactive		1 ½ days
HBSAB -HEPATITIS B SURFACE ANTIBODY	Immunology	Blood/LRT	Method: CHEMILUMINESCENCE	Nonreactive-<8	mIU/mL	1 ½ days
HB CORE AB	Immunology	Blood/LRT	Method: CHEMILUMINESCENCE	Nonreactive		1 ½ days
HB CORE AB IgM (HEPATITIS B CORE ANTIBODY IgM)	Immunology	Blood/LRT	Method: CHEMILUMINESCENCE	Non-reactive		1 ½ days
HBSAG (HEPATITIS B SURFACE ANTIGEN)	Immunology	Blood/LRT	Method: CHEMILUMINESCENCE. Reactive specimens are confirmed by neutralization.	Nonreactive		1 ½ days
HCT (HEMATOCRIT)	Hematology	Blood/SLT	See CBC	Male 38-52 Female 34-45	%	
HCV–AB SCREEN (HEPATITIS C VIRAL ANTIBODY)	Immunology	Blood/RT/LLT	Method: CHEMILUMINESCENCE. Reactive specimens are reflexed to HCV RNA, Quantitative, PCR	Nonreactive		1 ½ days

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
HCV RNA GENOTYPE, PCR	Client Services	Blood/LLT	Request requires a VL of >400 copies/mL			
HCV RNA, QUANT PCR	Molecular	Blood/LLT	Method: Real-time PCR. Must be AB+ for VL testing. Test performed M-F (not on holidays).	Not detected	IU/mL	
hs CRP (High Sensitivity CRP)	Chemistry	Blood/RT	Method: IMMUNOTURBIDIMETRIC Test performed Mon & Thur.	Cardiovascular Risk: 0.0-3.0 Interpretation: <1.0 = low/mild risk 1.0-3.0 = average risk 3.1-10.0 = high risk >10 persistently may represent non-cardiac inflammation	mg/L	3-5 days
HDL (HDL-CHOL, HDL CHOLESTEROL, HIGH DENSITY LIPOPROTEIN)	Chemistry	Blood/LLGT, SST, RT	Method Direct measure; polymer-polyanion. Collect **fasting specimen**, preferably for 12 hours. Centrifuge and separate immediately.	40-60 (Refer to Tables 1-4, pp. DD-EE)	mg/dL	4 hr
HELICOBACTER PYLORI ANTIBODY	Immunology	Blood/RT	Method: EIA Test run Thursday (not on holidays)	Negative		8 hr
HELPER/SUPPRESSOR RATIO	Flow Cytometry	Blood/SLT	Refer to CD4/CD8 test.	0.8-3.1	Ratio	
HGB (HEMOGLOBIN)	Hematology	Blood/SLT	See CBC	Male: 13.0-17.3 Female: 11.5-15.3	g/dL	
HEMOGLOBIN A1C (GLYCOSYLATED Hgb)	Chemistry	Blood/SLT	Method: HPLC Collection Frequency: 60-90 days.	Non-diabetic: 4.2-5.7 Pre-diabetic: 5.8-6.4 Diabetic: 6.5 or higher	%	4 hrs
HEMOSIDERIN, URINE	Client Services	10mL Urine Contact Client Svc. for urine collection and handling instructions	Referral Test.			

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
HEPATIC FUNCTION PANEL	Chemistry	Blood/LLGT, SST, RT	Panel includes: Direct Bilirubin, Total Bilirubin, Alkaline Phosphatase, AST, ALT, Albumin, and Total Protein	See individual tests		4 hrs
Herpes Simplex Virus 1 & 2 IgG	Immunology	Blood/RT	Method: EIA Test run Tuesday (not on holidays)	Negative		
HISTOPLASMA ANTIBODY	Client Services	Blood/RT Urine	Referral test. .			
HIV Ag/Ab	Immunology	Blood/RT	Method: CHEMILUMINESCENCE Requires verbal informed consent documented in the patient's electronic medical record. Reactive specimens are confirmed by HIV 1/2 STAT-PAK	Nonreactive		1 days
HIV-1 RNA, Quant PCR	Molecular	Blood/LLT	Method: Real-time PCR. Must be Ab+ for VL testing. Test performed M-F (not on holidays).	Not detected	copies/mL	1 week
HIV-1 Genotype	Client Services	Blood/LLT	Request requires a VL of >400 copies/mL			
HUMAN CHORIONIC GONADOTROPIN (BETA SUBUNIT or BETA HCG) QUANTITATIVE	Chemistry	Blood/RT, SST	CHEMILUNINESCENCE IMMUNOASSAY	Male or non-pregnant female: 0.6-2.9 Indeterminate 3-5 High: >5.0	mIU/mL	2 hours
HPV PCR	Molecular	Cervical/PreservCyt Soluntion		Not Detected		3-4 days
IGA, SERUM	Client Services	Blood/ RT	Referral Test.	Age dependent	mg/dL	2-4 days
IGG, TOTAL – SERUM	Client Services	Blood/ RT	Referral Test.			
IGM, SERUM	Client Services	Blood/ RT	Referral Test.			
IMMATURE PLATELET COUNT (IPF)	Hematology	Blood/SLT	Mix tube gently, immediately after collection. CLOTTED or HEMOLYZED specimens are unacceptable.	0.9-11.2	%	4 hrs

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
IMMUNOELECTRO-PHORESIS (IEP, IFE, IMMUNOFIXATION ELECTROPHORESIS).	Chemistry	Blood/RT Urine/24 hr CSF/Black screw-top tube	Method: GEL ELECTROPHORESIS Reflex test only based on pathologist's interpretation of the protein electrophoresis.	Reported with pathologist's interpretation.		7-10 days
INFLUENZA TYPE A+B, RAPID TEST	Tyler	Nasopharyngeal Swab		Negative		15 min
IONIZED CALCIUM			See CALCIUM, IONIZED			
IPF, See IMMATURE PLATELET COUNT						
IRON	Chemistry	Blood/LLGT, SST	Method: FERRACHROME/FERROZINE Plasma must be separated within 1 hour of collection. HEMOLYZED samples are unacceptable.	30-148	µg/dL	4 hr
Kappa/Lambda Free Light Chain (K/L FLC)	Chemistry	Blood/RT	Hemolysed specimens unacceptable. Test run Wed. & Friday	Kappa: 3.30-19.40 Lambda: 5.71-26.30 K/L FLC Ratio: 0.26-1.65	mg/L	3-5 days
KOH (fungus) PREP	Microbiology	Skin scrapping, hair, nails,	Potassium Hydroxide	Negative		24 hr
LACTIC ACID (LACTATE, PLASMA)	Chemistry	Blood/SGRT	Method: L-LACTATE OXIDASE Sample tube should be placed **on ice** and delivered to lab immediately after collection. Avoid prolonged application of tourniquet.	0.5-2.2	mmol/L	2 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
LD (LACTATE DEHYDROGENASE)	Chemistry	Blood/LLGT, SST, RT	Method: Lactate to pyruvate ISOENZYMES are referral test: requires staff signature (not performed if LD ≤200) Hemolyzed samples are unacceptable	98-192	U/L	4 hr
LDL-Direct	Chemistry	Blood/LLGT, SST, RT	Method: ENZYMATIC/COLORIMETRIC Direct Measure Collect **fasting specimen,** preferably 12 hours fasting.	<100	mg/dL	4 hrs
LEAD	Client Services	Blood/RBT Urine, Random Urine, 24 hour	Referral test. Collect using powder-free gloves and lead-free alcohol wipes.			
LEGIONELLA CULTURE	Microbiology	Sputum, blood, sterile body fluids, respiratory secretions, tissue/STR		No Legionella isolated		14 days
LEGIONELLA URINARY ANTIGEN	Urinalysis	Urine/UR	Method: IMMUNOCHROMATO-GRAPHIC ASSAY Qualitative detection of Legionella phneumophilia serogroup 1 antigen.	Negative		2 hr
LH (LUTEINIZING HORMONE)	Chemistry	Blood/RT, SST	Method: CHEMILUMINESCENCE Test run Mon-Sat	Males: 1.2-8.6 Females: -Follicular Phase: 2.1-10.9 - Mid Cycle Phase: 19.2-103.0 - Mid Luteal Phase: 1.2-12.9 -Post Menopause: 10.9-58.7	mIU/mL	1-2 days
LH-POOLED	Chemistry	Blood/RT, SST	Method: CHEMILUMINESCENCE. Test run Mon-Sat.	Males: 1.2-8.6 Females: -Follicular Phase: 2.1-10.9 -Mid Cycle Phase: 19.2-103.0 - Mid Luteal Phase: 1.2-12.9 -Post Menopause: 10.9-58.7	mIU/mL	1-2 days
LIPASE	Chemistry	Blood/LLGT, SST, RT	Method: PHOTOMETRIC/KINETIC USING PANTEGHINI METHOD	0-51	U/L	4 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
LIPID PROFILE	Chemistry	Blood/LLGT, SST, RT	Fasting Panel includes: Cholesterol, Triglyceride, HDL, Non-HDL, LDL (calc) and VLDL (calc) [See pages DD-EE for Risk Factors]. When LDL (calc) is <30 or Triglyceride is >400, LDL-Direct is performed as reflex test.	Cholest. 100-200 Triglyceride <150 HDL 40-60 LDL <100 VLDL <30 Non-HDL <130	mg/dL	4 hr
LITHIUM	Chemistry	Blood/SST, RT	Method: SPECTROPHOTOMETRIC Performed immediately upon receipt.	0.5-1.2	mEq/L	4 hrs
LIVER PANEL			(See HEPATIC PANEL)			
LKM-1 ANTIBODY	Immunology	Blood/RT	Method: EIA. Test performed Thursday (not on holidays)	Negative <=20.0	Units	1 week
LUPUS ANTICOAGULANT PANEL	Client Services	Blood/ 2 CBT and 1 SLT	Referral Test.			
MAGNESIUM	Chemistry	Blood/LLG, SST, RT Urine/24 hr	Method: CALMAGITE	Serum: 1.3-2.1 Urine: 1.0-24.0	mEq/L mEq/24 hr	4 hrs
MALARIA SMEAR (THIN AND THICK PREPS)	Hematology	Blood/SLT	Blood samples must be delivered to Lab within 30-60 minutes of collection.	Negative for malaria forms		2 hrs
MERCURY	Client Services	Blood/RBT(glass) Urine/TM-free cup, 24 hr urine container (contact CSU)	Referral Test. .	Blood: 0-4.9 Urine: <20	µg/L	3 days
MEASLES IGG	Immunology	Blood/RT	Method: EIA. Test performed Tuesday.	Negative		8 hrs

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
METANEPHRINES, FRACT, URINE	Client Services	Urine/UR (24 hour)	Referral Test.			
METHADONE	Toxicology	Urine/UR	See DRUG SCREEN	Negative		8 hrs
METHADONE METABOLITE (EDDP) SCREEN	Toxicology	Urine/UR	Included in: DAU-OMT panel. Not included in routine Drug Screen.	Negative		8 hrs
MHA-TP	Immunology	Blood/RT	Method: MICROHEMAGGLUTINATION Syphilis confirmatory test. Run Mon., Wed., & Friday (not on holidays).	Nonreactive		4 hr
MICROALBUMIN	Chemistry	Urine/random, 24 hr	Method: IMMUNOTURBIDIMETRIC	Adult: 0-23	mg/L	2-4 days
MITOCHONDRIAL ANTIBODY	Immunology	Blood/RT	Mehtod: EIA. Test performed Wednesday (not on holidays).			
MRSA DIRECTIVE (NASAL) SCREEN CULTURE	Microbiology	Red Cap Culture swab	Nasal screen performed on all transfer and discharge patients	Negative		24 hr
MRSA NXG SURVL NARES DNAPCR-	Microbiology	Red Cap Culture swab	Nasal screen performed on all patients upon admission and transfers to ICU's	None Detected		2 hr
MUMPS, IGG	Immunology	Blood/RT	Method: EIA. Test performed Tuesday	Negative		8 hr.
MYCOBACTERIUM TUBERCULOSIS (PCR)	Microbiology	Sputum	Not orderable by providers	None detected		2 hr
MYCOLOGY CULTURE	Microbiology	See remarks	Refer to the Microbiology section of this manual for specific collection guidelines	No growth		4 weeks
MYOGLOBIN (BIOSITE)	FWOPC, Bonham	Plasma/Pink top tube	FLUORESCENT IMMUNOASSAY	0-170 ng/mL		2 hr
MYOGLOBIN (STAT)	Chemistry	Blood/LLGT, SST, RT	Method: CHEMILUNINESCENCE	Male: 0.0-106.0 Female: 0.0-66.0	ng/mL	30 min
MYOGLOBIN, URINE	Client Services	Random Urine/UR	Referral Test. Must submit an e-Consult..			

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
OLIGOCLONAL BANDS	Client Services	CSF/Black screw-top tube	Method: ELECTROPHORESIS Also submit Blood (RT) for simultaneous SPEP.	Absent or Not Present		7-14 days
OPIATE SCREEN	Toxicology/P&LMS Bonham	Urine/UR	See DRUG SCREEN	Negative		8 hr
OSMOLALITY (OSMO. Manual)	Chemistry	Blood/SST, RT, LLGT Urine /TEK tube	Method: FREEZING POINT	Serum: 275-295 Urine: 50-1200	mOsM/kg	4 hr
OXYCODONE/ OXYMORPHONE SCREEN	Toxicology	Urine/UR	Included in: DAU-PAIN, DAU-P-E, DAUGOLD, and DAU-OMT panels. Not included in routine Drug Screen	Negative		8 hr
pH, FLUID	Chemistry	Body fluids/LLGT, SGT	Method: pH METER Specimen must be received on ice	Variable		4 hr
pH – TOXICOLOGY	Toxicology	Urine/UR	Part of URINE ADULTERATION PANEL	Reference Low: <4.5 High: >9 *Values <4.5 and >9 suggest the addition of an adulterant (acid or alkali)		8 hr
PHENCYCLIDINE SCREEN	Toxicology/P&LMS Bonham	Urine/UR	See DRUG SCREEN	Negative		8 hr
PHENOBARBITAL	Chemistry	Blood/RT	Method: IMMUNOTURBIDIMETRIC Sampling Time: 1 hour prior to next dose. After dosing, Steady State should be achieved before sampling.	Therapeutic Range: 15-40	µg/mL	4 hr
PHENYTOIN (See DILANTIN)	Chemistry	Blood/RT			µg/mL	4 hr
PIN WORM PREP	Microbiology	Paddle kit – Commercial	Contact Microbiology (x70672) for paddle kit.	No Enterobius vermicularis seen		24 hr Mon - Fri
PLATELET COUNT	Hematology	Blood/SLT	See CBC	140-400	K/µL	4 hr
PHOSPHATE (PO4; PHOSPH.)	Chemistry	Blood/LLGT, SST Urine – 24 hr	Method: PHOSPHOMOLYBDATE-UV	Serum: 2.4-4.5 Urine: 0.4-1.3	mg/dL g/24hr	4 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
PNEUMOCYSTIS, DFA PNEUMOCYSTIS, PCR	Client Services	Sputum or Bronchial washing	Referral Test.			
POTASSIUM (K)	Chemistry	Blood/ LLGT, SST, RT Urine-24 hr	Method: ISE INDIRECT Hemolyzed specimens are unacceptable for analysis.	Serum: 3.3-5.1 Urine: 25 -125	mmol/L mmol/24 hr	4 hr
PREALBUMIN, SERUM	Chemistry	Blood/RT, SST	Method: IMMUNOTURBIDIMETRIC	20-40	mg/dL	4 hr
PREGNANCY TEST (B-HCG, QUALITATIVE)	Chemistry	Blood/RT Urine/UR	Method: MONOCLONAL ANTIBODY-HCG First-morning urine preferred. Detects B- HCG low as 20 mIU/mL.	Male and non-pregnant female: Negative		2 hr 1 hr
PREGNANCY TEST (B-HCG, QUANTITATIVE)	Chemistry	Blood/SST	Method: CHEMILUMINESCENCE	Serum: Male and non-pregnant female: 0.0-2.9 Indeterminate: 3-5 High: >5.0 High	mIU/mL	
PREGNANCY TEST (B-HCG, QUANTITATIVE)	Ancillary Testing-Garland, Grand Prairie, Plano, Polk, Tyler	Urine	Method: CHROMATOGRAPHIC IMMUNOASAY-HCG. First-morning urine preferred. Detects b-HCG as low as 20 mIU/Ml.	Males and non-pregnant femal: Negative		1 hr
PRESURGICAL SCREEN, ABO/RH/ABS	Transfusion Medicine	Blood/LT, Pink Top	For Outpatients Only. To be collected same day as presurgical lab orders	ABO/Rh N/A ABS: Negative		1-4 hr
Potassium Hydroxide (Provider Performed)	Dallas, Bonham, FWOPC-Derm CL	Skin, Hair, Nails and Skin Mites		Fugal Elements: Absent Scabies, Mites, eggs or feces: Absent		Immed
PRIMIDONE + PHENOBARBITAL	Client Services	Blood/RT	Referral Test.			
PROCAINAMIDE and NAPA	Client Services	Blood/RT, LGT	Referral Test Sampling Time: 0-1 hour prior to next dose.			
PROCALCITONIN (PCT)-NTX	Immunology	Blood/LLGT	Method: CHEMILUMENESCENCE	<0.05	ng/mL	1-4 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
PROLACTIN	Chemistry	Blood/SST, RT	METHOD: CHEMILUMINESCENCE Test run Mon thru Sat	Male: 2.6-13.1 Female: Premenopausal: 3.3-26.7 Postmenopausal: 2.7-19.6	ng/mL	1-2 days
PROSTATE SPECIFIC ANTIGEN (PSA), TOTAL	Chemistry	Blood/SST, RT	METHOD: CHEMILUMINESCENCE Test run Mon thru Sat	0.0-4.0	ng/mL	1-2 days
PROTEIN C/ PROTEIN S	Client Services	Blood/two (2) CBT	Referral Test. .			
PROTEIN ELECTRO-PHORESIS, SERUM (SPEP, SPE)	Chemistry	Blood/RT	Hemolyzed samples unacceptable. Test run Monday-Friday.	Albumin: 3.5-5.8 Alpha-1-globulin: 0.11-0.32 Alpha-2-globulin: 0.22-1.10 Beta–globulin: 0.53-1.10 Gamma-globulin: 0.5-1.5	g/dL	3-5 days
PROTEIN ELECTRO-PHORESIS, URINE (UPEP)	Chemistry	Urine/24 hr collection recommended	Test run Monday-Friday.	Pre-albumin: 1-2 Albumin: 33-43 Alpha-1-globulin: 24-30 Alpha-2-globulin: 17-23 Beta–globulin: 6-12 Gamma-globulin 3-7	%	3-5 days
PROTEIN, TOTAL	Chemistry	Blood/LLGT, SST, RT Urine-24 hr Body fluids	Method: BIURET-Serum and Plasma PYROGALLOL RED-Urine and CSF	Plasma: 6.1-8.2 Serum: 6.1-8.2 Urine: 0-150 CSF: 15-45	g/dL g/dL mg/24hr mg/dL	4 hr
PROTEIN, TOTAL-URINE	Chemistry	Urine 24 hr, random	Method: PYROGALLOL RED	Urine: 0-150	mg/24hr	4 hr
PROTEIN, TOTAL – FLUIDS	Chemistry	SST	Method: BIURET	None	g/dL	4 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
PROTEIN, TOTAL – CSF	Chemistry	CSF/Black Screw Top	Method: PYROGALLOL RED	CSF: 15-45	mg/dL	4 hr
PROTHROMBIN TIME (PT)	Hematology	Blood/CBT	Method: OPTICAL Tube must be drawn to capacity, and delivered to Laboratory within 24 hours of collection at room temperature. If >24 hours centrifuge sample, remove and freeze plasma.	9.4-12.5	sec	4 hr
PT MIXING STUDY	Client Services	Blood/CBT	Referral Test			
PTH – INTACT (PARATHYROID HORMONE INTACT)	Chemistry	Plasma/Pink Top	Method: CHEMILUMINESCENCE *IF PTH surgery is scheduled lab requires 24- hour notice. Hemolyzed sample not acceptable.	12-88	pg/mL	4 hr
PTH-IO (PARATHYROID HORMONE INTRA-OPERATIVE)	Chemistry	Plasma/Pink Top	Method: CHEMILUMINESCENCE *IF PTH surgery is scheduled lab requires 24-hour notice. Hemolyzed sample not acceptable.	12-88	pg/mL	30-45 mins
PTT (ACTIVATED PARTIAL THROMBOPLASTIN TIME; APTT)	Hematology	Blood/CBT	Method: OPTICAL Draw tube to capacity; Deliver to lab within 4 hours of collection. If >4 hours centrifuge sample, remove and freeze plasma.	25.1-36.5	sec	4 hr
PTT-HEPARIN	Hematology	Blood/CBT	Ordered on patients that are on Heparin therapy. Draw tube to capacity; Specimen must be centrifuged within 1 hour of collection. Deliver to lab within 1 hour of collection. If >1-hour centrifuge sample, remove and freeze plasma.	25.1-36.5	sec	4 hr
PTT MIXING STUDY	Client Services	Blood/CBT	Referral Test.			

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
QUANTIFERON TB Gold Plus	Immunology	Blood/ LLGT	Due to sample stability and time sensitive preanalytical processing procedures, this assay will be collected utilizing the following schedule: Dallas Inpatient: Sunday-Friday Dallas Outpatient: Monday-Friday All other Outpatient Clinics: Monday- Thursday	Negative		3 days
RESPIRATORY PCR (RP2.1)	Microbiology	Universal Transport Medium		None Detected	N/A	2 hr
RETICULOCYTES	Hematology	Blood/SLT	Method: FLOW CYTOMETRY Urgency: routine	0.64-2.26	%	4 hr
RHEUMATOID FACTOR (RF)	Chemistry	Blood/SST, RT	Method: IMMUNOTURBIDIMETRIC Test run M-F	0.0-10.9	IU/mL	2-4 days
RPR	Immunology	Blood/RT	Used as a confirmatory test for Reactive Treponemal Antibody testing	Nonreactive		2-3 days
RUBELLA IGG	Immunology	Blood/RT	Method: EIA Test run Tuesday.	Negative		8 hr.
SALICYLATE (ASA, ASPIRIN)	Chemistry	Blood/RT	Method: ENZYMATIC	Therapeutic Range: 100-200 Toxic: >300	mg/L	4 hr
SARS-CoV-2 Antibody (IgM/IgG)	Client Services	Blood/SST				
SARS-CoV-2 PCR	Microbiology Molecular	Viral Transport Media	Samples must be performed within 48 hours of collection or frozen at -70ºC	Not Detected		24-48 hours
SCABIES (ITCH MITE) EXAM	Microbiology	Skin scrapings/Screw top container		No Sarcoptes scabei seen		24 hr Mon – Fri

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
SEDIMENTATION RATE (SED RATE; ESR)	Hematology	Blood/SLT	Method: Quantitative Capillary Photometry (aggregation) URGENCY: routine	Male: <50 yr 0-15 50-84 yr 0-20 >84 yr 0-30 Female <50yr 0-20 50-85 yr 0-30 >84 yr 0-42	mm/hr	4 hr
SEMEN ANALYSIS (POST-VASECTOMY, QUALITATIVE)	Hematology	Semen/UR	Method: MANUAL WET PREPARATION Test for **Urology Clinic only. Available Mon-Fri, 8 AM – 2:30 PM** Specimen will be collected in Urology Clinic. call the lab at Ext.70686, and immediately deliver to lab.	Sperm absent		1-2 hr
SEMEN ANALYSIS	Client Services	Semen	Referral Test. Submit an Infertility e-consult to Urology. Urology will accept the consult with instructions to report to the Dallas Urology Tech Clinic at a specified time for sample collection.			1 day
SGOT (AST)	Chemistry	Blood/LLGT, SST, RT	See AST			
SGPT (ALT)	Chemistry	Blood/LLGT, SST, RT	See ALT			
SMOOTH MUSCLE ANTIBODY (F-ACTIN)	Immunology	Blood/RT	Method: EIA Test performed Thursday (not on holidays).	Negative (≤20)	Units	1 week
SODIUM (Na)	Chemistry	Blood/LLGT, SST, RT Urine-24 hr	Method: ISE Indirect	Serum: 133-145 Urine: 40-220	mmol/L mmol/24 hr	4 hr
SPECIFIC GRAVITY	Urinalysis	Urine/UR	Part of Urinalysis	1.005-1.030		4 hr
SPECIFIC GRAVITY-TOXICOLOGY	Toxicology	Urine/UR	Included in URINE ADULTERATION PANEL	<1.003 may indicate diluted urine		8 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
SURGICAL PATHOLOGY	Surgical Pathology	1. Tissue/60 mLl Formalin 2. Lg. Tissue/16-165 oz container with Formalin 3. Bone Marrow/B5 container 4. Fresh tissue for special testing does not use a container	FROZEN SECTION- fresh tissue for immediate diagnosis AKA/BKA- fresh tissue placed in red biohazard bag			2 days approx.
STREP Pneumo. AG Ur	Urinalysis	Urine Cup	BinaxNOW *Streptococcus pneumoniae*) Immunochromatographic (ICT) assay	Negative		4 hr
TACROLIMUS	Immunology	Blood/MLT	Method: CHEMILUMINESCENCE	5.0– 20.0	ng/mL	4 hrs
T-3 RESIN UPTAKE	Client Services	Serum/LRT	Referral Test. Signed authorization by a staff physician required			
T3 (TRI-IODOTHYRONINE)	Client Services	Serum/RT	Referral Test. Signed authorization by a staff physician required.			
TESTOSTERONE	Chemistry	Blood/SST, RT	Method: CHEMILUMINESCENCE Test run Mon - Sat.	Male: 1.7-7.6 Female: 0.0-0.9	ng/mL	1-2 days
TESTOSTERONE-POOLED	Chemistry	Blood/SST, RT	Method: CHEMILUMINESCENCE Test run Mon - Sat	Male: 1.7-7.6 Female: 0.0-0.9	ng/mL	1-2 days
THEOPHYLLINE	Chemistry	Blood/RT	Method: IMMUNOTURBIDIMETRIC Dosing time varies due to different product formulations	Therapeutic Range: 10-20	µg/mL	4 hr
THROMBIN TIME	Client Service	Blood/CBT	.			
THYROID STIMULATING HORMONE (TSH)	Chemistry	Blood/SST, RT	Method: CHEMILUMINESCENCE Test run Mon - Sat	0.45-5.33	µIU/mL	1-2 days
THYROXINE (T4)	Client Services	Serum/LRT	Referral Test. Signed authorization by a staff physician required.			

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
TOBRAMYCIN	Chemistry	Blood/RT	Refer to Quick Guide at end of this yellow page section. Method: IMMUNOTURBIDIMETRIC PEAK: Sampling Time - 30 minutes after last dose. TROUGH: Sampling Time - 0-30 minutes prior to next dose.	Trough: <2 Peak: 5-10	µg/mL	4 hr
TOPIRAMATE	Client Services	Blood/RT, LGT	Referral Test.	Clinician Interpretation	mcg/mL	
TRANSFERRIN	Chemistry	Blood/LLGT, SST, RT	Method: IMMUNOTURBIDIMETRIC	200- 400	mg/dL	4 hr
TRANSFUSION REACTION WORKUP	Transfusion medicine	Blood/Pink Top, urine	Notify Transfusion Medicine immediately. Complete report of suspected transfusion reaction form.	N/A		1-4 hr
TREPONEMA PALLIDUM ANTIBODY	Immunology	Blood/RT	SYPHILIS SCREENING test. Method: ELISA. Reactive tests will be confirmed by RPR with titer. MHA-TP performed on Nonreactive RPR. Test run M,W,F. (Not on holidays.)	Nonreactive		1 working day
TRICHOMONAS (WET PREP) SCREEN	Microbiology	Penile discharge Vaginal swab placed in tube with 1 mL saline	Deliver to Lab immediately.	Negative		4-24 hr
TRIGLYCERIDE	Chemistry	Blood/LLGT, SST, RT,	Method: GPO/ENZYMATIC **Fasting** specimen required, preferably 12 hours.	<150 (Refer to Tables 1-4, pp. Y-Z)	mg/dL	4 hr
TROPONIN-I TROPONIN POC	Chemistry iSTAT-Point of Care	LLGT	Method: CHEMILUMINESCENCE Moderately hemolyzed sample is not acceptable.	0.00-0.04	ng/mL	1 hr Med Emerg.
TYPE & SCREEN (T&S)	Transfusion Medicine	Blood/PinkTop, LLT	Inpatients only-Must be accompanied by SF-518 form.	Antibody Screen Negative		1-4 hr
UREA NITROGEN	Chemistry	Blood/LLGT, SST, RT Urine-24 hr or random	See "BUN"	Serum: 6-20 Urine: 6-17	mg/dL g/24 hr	4 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
URIC ACID	Chemistry	Blood/LLGT, SST, RT Urine-24 hr or random	Method: URICASE	Serum/Plasma: Male: 3.4-7.8 Female 2.4-5.7 Urine 250-750	mg/dL mg/24hr	4 hr
URIC ACID PATIENT ON RASBURICASE	Chemistry	Blood/LLGT, SST, RT	Method: URICASE Notify lab ahead of time. Sample must be placed on ice immediately after collection, kept on ice and tested cold.	Same as above	Same as above	Same as above
URINALYSIS (U/A)	Urinalysis	Urine/UR, USP, UYT	Specimen must be less than 2 hours old.	Specific Gravity: 1.005-1.030 pH: 5.0-7.5 Protein: Negative Glucose: Negative Ketone: Negative Bilirubin: Neg Blood: Negative Nitrite: Negative Leukocyte: Neg Urobilinogen: 0.2-1.0		4 hr
URINALYSIS (POC- UA Panel)	Urology	Urine	Specimen must be less than 2 hours old.	Blood-Negative Leukocyte: Negative Nitrite: Negatove		
URINALYSIS WITH MICROSCOPIC	Urinalysis	Urine/UR, USP, UYT	Specimen must be less than 2 hours old.	See Urinalysis Ranges for UA Microscopic Ranges: RBC: 0-2/HPF WBC: 0-5/HPF Epithelial Cells: 0-5/HPF Cast(hyaline): 0-3/LPF Bacteria: None Catheterized: No microscopic findings		4 hr
URINE ADULTERATION PANEL	Toxicology	Urine/UR	Tests include: Creatinine–Tox, pH–Tox, and Specific Gravity-TOX			8 hr
URINE EOSINOPHILS	Hematology	Urine/UR	Must be fresh urine sample.	None seen	%	4 hr

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
URINCE MICROSCOPY (Provider Performed)	Nephrology	Urine	Specimen must be less than 2 hours old	RBC: 0-2/HPF WBC: 0-5/HPF Urothelial (Transitional): 0-1/HPF Epithelial Cells Renal: 0-1/HPF Epithelial Cells Squamous: 0-5/HPF Trichomonas: None/HPF Oval Fat Bodies: 0-1/HPF Bacteria: None/HPF Casts (Hyaline): 0-3/LPF Other casts: None/LPF Crystals: Crystals present in Normal Acid Urine: Uric Acid, Amorphous Urate, Calcium Oxalate, and Hippuric Acid Crystals present in Normal Alkaline Urine: Amorphous Phosphate, Triple Phosphate, Calcium Phosphate, Calcium Carbonate, and Ammonium Biurate		
Vaginitis Panel (Candida sps, Trichomonas vaginalis, Gardnerella vaginalis)	Immunology	AFFIRM collection kit provided by Client Services	Method: DNA PROBE Samples are batched and test performed once per day M-F (not on holidays)	Negative		1 Working day

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
VALPROIC ACID	Chemistry	Blood/RT	Method: IMMUNOTURBIDIMETRIC	Therapeutic Range: 50-125	µg/mL	4 hr
VANCOMYCIN	Chemistry	Blood/RT	Method: IMMUNOTURBIDIMETRIC PEAK: Sampling time is 2 hrs. after last dose. TROUGH: Sampling time is 0-15 minutes prior to next dose. Refer to Timing Guide, end of this section.	Therapeutic Range: Peak: 20-40 Trough: 10-20	µg/mL	4 hr
VDRL (CSF)	Immunology	CSF/Black screw- top tube	Performed M-F. (Not on holidays.) Titer performed on positive specimens..	Nonreactive		1 day
VIRAL CULTURE	Client Services		Referral Test. Signed authorization by a staff physician required. Source is required at time of order.			
VIBRIO CULTURE	Microbiology	Stool/Sterile leak-proof screw cap cup	Refer to Microbiology Section, this manual, for specific collection guidelines.	Negative	N/A	2-3 days
VISCOSITY, SERUM	Chemistry	Blood/RT 2 full tubes are required	Method: OSTWALD VISCOMETER Test run Monday thru Friday 8am-3pm (on day shift) as requested.	1.4-1.8		4 hr
VITAMIN B-12	Chemistry	Blood/SST, RT	Method: CHEMILUMINESCENCE Performed Mon thru Sat	180-914	pg/mL	1-2 days

	Department	Specimen / Container	Special Remarks	Reference Range	Units	TAT
VITAMIN D, 25-OH TOTAL	Chemistry	Serum/RT	Performed by CHEMILUMINESCENCE. Total Vit D: <20 ng/mL is considered deficient 21-29 ng/mL is considered insufficient ≥30 ng/mL is considered sufficient ≥150 ng/mL is considered toxic Performed Mon thru Sat	≥30	ng/mL	1-2 Days
VLDL	Chemistry	Serum/RT	Part of Lipid Profile.	See Lipid Profile		
V-Z ANTIBODY *(Varicella zoster)*	Immunology	Blood/RT	Method: ELISA Test run Tuesday.	Negative		8hr
WBC (WHITE BLOOD CELL COUNT, TOTAL BLOOD) [Also see FECAL LEUKOCYTES]	Hematology	Blood/SLT	See CBC	4.0-11.0	K/µL	4 hr
WBC IMMUNOPHENOTYPING PANEL	Flow Cytometry	1) Blood/ YT(ACD) 2) Lymph node – RPMI solution (Available from Histology) 3) Bone marrow – Heparinized syringe (0.2 mL Heparin [1000 U/mL], in 10 mL syringe) or YT (ACD) 4) Body fluids - YT(ACD)		Dependent upon Pathologist interpretation		
WESTERGREN (See SEDIMENTATION RATE)						
WET PREP (VAGINAL) (SEE TRICHOMONAS)						
YERSINIA CULTURE	Microbiology	Stool/Sterile, leak-proof, screw cap, plastic cup		No growth		2-3 days
Zinc Serum	Client Services	Blood/RBT, RBT	Referral test.	0-40	µg/dL	3 days

Explanation of Container Codes:

CBT – Small Light Blue Top tube, Na Citrate (4.5 mL)
GBT – Greiner 2 mL blue top, 3.2% sodium citrate
GGT – Large Greiner 9 mL Lithium Heparin
LGT – Green Top tube, Lithium Heparin (4.5 mL)
LLGT – Light Green Top tube, Lithium Heparin (7.0 mL)
LLT – Large Lavender top tube, EDTA (10 mL)
LRT- Large Red Top (10 mL)
MLT – Medium lavender top, EDTA (7mL)
Pink Top – Pink Top tube, EDTA (7 mL)
PLP -Plastic Leak-proof Container
RT -Red Top tube (7 mL)
RBT – Royal Blue Top tube with RED strip, no additive (7 mL)
RBT – Royal Blue Top tube with no stripe, EDTA (7 mL)
SGRT - Small Gray Top tube, Na Fluoride, K Oxalate (5 mL)
SGT – Small Green Top tube Na Heparin (3 mL)
SLT -Small Lavender Top tube, EDTA (4 mL)
SST -Gold Top Serum Separator Tube, Silicone gel (5 mL)
STR – Sterile leak proof container, cup or tube
SWB – Swab with transport media
TM-free Cup – Trace metal free urine cup
UGT – Gray Top tube for urine culture
UR - Plastic screw cap urine cup (BD Vacutainer Urine Cup)
USP – Speckled (red/yellow) Top tube for urine (In-patient, CBOC)
UYT – Yellow Top tube for urine (Out-patient, ED, SDS)
YT -Yellow Top tube, Acid Citrate Dextrose (10 mL)

Test Methodology Abbreviation Key:

DPD - 2,5-dichlorophenyldiazonium tetrafluoroborate
EIA – Enzyme Immunoassay
ELISA – Enzyme-linked Immunosorbent Assay
EMIT - Enzyme Multiplied Immunoassay Technique
GLDH - Glutamate Dehydrogenase
GPO - Glycerol Phosphate Oxidase
HPLC - High Performance Liquid Chromatography
ICP/MS - Inductively Coupled Plasma/Mass Spectrometry
ICT - Ion Capture Technology
IFCC – Int'l. Fed. Clinical Chemistry Reference Enzymatic Reaction
ISE Indirect - Ion Selective Electrode
MEIA - Microparticle Enzyme Immunoassay

Paper Copies are not Document Controlled

NAC -N-acetyl-L-cysteine
PCR -Polymerase Chain Reaction
PEPC ENZYMATIC -- Phosphoenolpyruvate carboxylase

Paper Copies are not Document Controlled

VANTHCS REFLEXED TESTS

SCREENING TEST:	SCREENING TEST C0NDITION:	REFLEXED TEST:
TREPONEMAL ANTIBODY	REACTIVE	RPR, RPR TITER, and MHA-TP
CSF VDRL	REACTIVE	VDRL TITER
ANA PANEL (ANTINUCLEAR ANTIBODY, ANA)	POSITIVE	ENA-6, DOUBLE-STRANDED DNA (dsDNA), Anti-Sm, Anti-RNP, Jo-1, Scl-70, SS-A, SS-B
ANCA SCREEN (ANTI-NEUTROPHIL CYTOPLASMIC ANTIBODY)	POSITIVE	ANCA Vasculitides antibody testing, which includes myeloperoxidase (MPO) and proteinase 3 (PR3)
FUNGITELL STAT	INDETERMINATE or POSITIVE	FUNGITELL, Serum
CRYPTOCOCCAL ANTIGEN	POSITIVE	CRYPTOCOCCAL ANTIGEN TITER
BACTERIAL MENINGITIS ANTIGENS	ANTIGEN SCREEN TEST REQUESTED	BACTERIAL CULTURE
STOOL SUBMITTED TO MICROBIOLOGY FOR CULTURE AND/OR PARISITOLOGY	BLOODY SAMPLE	CULTURE FOR *E. coli* O157:H7
BLOOD OR STERILE FLUID SUBMITTED FOR FUNGAL / MYCOBACTERIAL CULTURE	BACTERIAL GROWTH ON FUNGAL OR MYCOBACTERIAL MEDIA ONLY	FULL WORKUP OF BACTERIAL ISOLATES
PROTEIN ELECTROPHORESIS, SERUM, URINE, OR CSF	SUSPECTED MONOCLONAL PROTEIN	IMMUNOELECTROPHORESIS
HIV AG/AB	REACTIVE	HIV 1/2 STAT

Paper Copies are not Document Controlled

HCV AB SCREEN	REACTIVE	HCV-RNA QUANTITATIVE PCR

QUICK GUIDE FOR ORDERING ANTIBIOTIC LEVELS

I. Intermittent (i.e., q8 and q12 hour) aminoglycosides [AMG] (amikacin, gentamicin and tobramycin) levels:

Trough levels	Peak levels
<30 minutes before the dose	30 minutes after the end of infusion

Therapeutic levels (trough)	Therapeutic levels (peak)
Gentamicin & Tobramycin ≤ 2 µg/mL	Gentamicin & Tobramycin: 5-10 µg/mL
Amikacin: 5-10 µg/mL	Amikacin: 20-25 µg/mL

II. Once daily AMG levels:

Peaks are not drawn

Draw a "random" level 8-12 hours after the start of infusion. The **recommended time is 10 hours after the start of the infusion.**

III. Timing of drug levels with Vancomycin

Trough Levels	Peak Levels	Therapeutic Levels
30 minutes before the dose.	One hour after end of infusion. Generally, not necessary. Perform if recommended by the Infectious Disease Consult Team	**Trough**: 10-20 µg/mL (> 20 µg/mL is a critical.
		Peak: 20-40 µg/mL

Vancomycin should be monitored by "trough" levels only

The above information regarding peak levels was provided for pharmacokinetics calculations. In general, Vancomycin should be monitored by trough levels. As stated above, the trough should be drawn just before the third or fourth dose and again just before 8th dose.

Noting the dose and blood level draw times is of paramount importance!

Paper Copies are not Document Controlled

ANCILLARY TESTING DEPARTMENT

LOCATION: Building 2, Room 2C-403J, Clinical Addition room 1B-480
SUPERVISOR: William Scott, EdD, MS, MLS(ASCP)^{cm} Extension: 73369, Cell: 817-262-8380
ANCILLARY TESTING COORDINATORS:
Jacquelyn Gray, MT(ASCP), Extension: 70713, Pager: 214-759-3051
Tamara West, MS-CPM, MLS(ASCP)^{CM} Extension: 73697, Pager: 214-344-0538
Christy Clemens, MLS(ASCP)^{CM} Extension: 74923, Pager: 214-786-2811

I. GENERAL INFORMATION:

The VA North Texas Health Care System (VANTHCS) Ancillary Testing Program consists of waived, Provider Performed, and non-waived FDA classified moderate complexity testing. According to federal regulations established under CLIA '88 and the Veterans Health Administration Handbook 1106.01, each laboratory or ancillary site performing testing must have available and adhere to the following: written policies and procedures for proper patient preparation; proper specimen collection, identification, preservation, transportation, and processing; accurate result reporting; and positive patient sample identification throughout the pre-analytic, analytic, and post-analytic processes.

Each service providing the above testing defines the extent (diagnostic vs. screening) of testing utilized and the purpose of the tests performed. A comprehensive listing of testing performed is maintained by the Ancillary Testing Coordinators. All quality control requirements are described in detail in the Pathology and Laboratory Medicine Quality Control Program, Appendix B (GEN.0054), Quality Management Program (GEN.0055), and in each technical procedure. Proficiency testing requirements are described in the Pathology and Laboratory Medicine Quality Control Program, Appendix B (GEN.0054) and the Quality Management Program (GEN.0055). Any requests for new tests to be performed outside the main clinical laboratory, and associated equipment needed, must be submitted in writing on GEN.0133 Request/Approval Form: New Instruments or Testing Products to an Ancillary Testing Coordinator or the Laboratory Manager, and approved by the Ancillary Testing/Laboratory Utilization Review (ATLUR) workgroup.

The following tests fall under the regulatory requirements of the VA, The Joint Commission, and the College of American Pathologists. Pathology & Laboratory Medicine Service has provided the following guidelines in order to comply with these regulations (refer to VANTHCS Memorandum 113-03 Ancillary/Point of Care Testing).

A. Waived Testing (WT):

Waived tests are performed outside of the clinical lab by non-laboratory personnel. They are usually performed at the patient's bedside, in the clinic, or other remote site. The following tests may be performed by approved staff and privileged providers at VANTHCS:

- Finger stick Glucose
- Qualitative Urine Pregnancy (hCG) (CBOCs only)
- iSTAT Creatinine
- Clinitek Urinalysis
- Binax Now Covid-19 Antigen Test

B. Provider Performed Testing (PPT):

PPT is a category of testing performed outside the laboratory, but separate from WT. It includes the following tests that may be performed as part of a physical exam by privileged providers:

- Ocular pH
- KOH (potassium hydroxide preparation)/Whiff test
- Urine Sediment Microscopy
- Fecal Occult Blood

Paper Copies are not Document Controlled

C. Moderate or High Complexity Tests:

All other tests not classified as "waived" are considered moderate or high complexity tests. Moderate complexity tests include: Activated Clotting Time [ACT], Oximetry, arterial/venous blood gas (ABG), and iSTAT Troponin-I. The Glomerular Filtration Rate is a high complexity test. Pathology and Laboratory Medicine Service is responsible for the development and monitoring of any tests that are performed outside of the main lab.

D. Testing Personnel:

1. Only qualified health care personnel may perform ancillary testing. All quantitative and qualitative tests yielding numerical values and all microscopy performed by personnel other than a privileged provider are subject to accrediting agency guidelines.

2. Privileged providers (members of the medical staff or licensed independent practitioners privileged through the medical staff credentialing process) who perform waived tests or PPT must receive specific training and orientation for the tests they perform, document the appropriate quality control for the procedure performed, and maintain satisfactory levels of competence (The Joint Commission PC 16.10-16.30).

3. The competency of each person performing ancillary testing must be assessed following training and before the person performs patient testing and reports patient results. Waived testing competency must be assessed following training and annually thereafter. Non-waived testing competency must be assessed following training, at least semiannually during the first year, and annually thereafter. Initial training/competency for physicians performing fecal occult blood testing is required, but annual competency assessment thereafter is not required (VANTHCS Memorandum No. 113-03). All appropriate records and documentation will be kept with the Ancillary Testing Coordinator and/or the appropriate service. Retraining and reassessment of employee competency must occur when problems are identified with employee performance.

4. Elements of competency assessment required by TJC for non-waived tests (not all the elements are required for waived testing) include:

   a) Direct observation of routine patient test performance, including, as applicable, patient identification and preparation; and specimen collection, handling, processing, and testing.

   b) Monitoring the recording and reporting of test results, including, as applicable, reporting critical results.

   c) Review of intermediate test results or worksheets, quality control records, proficiency testing results, and preventive maintenance records.

   d) Direct observation of performance of instrument maintenance and function checks, as applicable.

   e) Assessment of test performance through testing previously analyzed specimens, internal blind testing samples, or external proficiency testing samples.

   f) Evaluation of problem-solving skills.

5. Visual color discrimination assessment must be documented in the Employee Occupational Health Unit for each person who reads a fecal occult blood card or any other test procedure that produces a color change for interpretative reporting.

II. ORDERING TESTS:

An electronic order in CPRS/VistA or written requisition, submitted by an authorized caregiver, must

Paper Copies are not Document Controlled

accompany each patient specimen that is to be tested. The patient's chart or medical record may be used as the requisition. However, each test authorization, whether a hard copy requisition, electronic requisition, or one that is entered into the patient's chart, **must be retained for 2 years** and must contain the following information:

A. Full patient name and full Social Security number.

B. Name and other suitable identifier of authorized caregiver, and if applicable, a contact person for the immediate reporting of critical values, if necessary.

C. Test(s) to be performed.

D. Date and time of specimen collection.

E. Patient Location

F. All additional relevant and necessary information to assure timely and accurate testing/reporting of results.

III. SPECIMEN COLLECTION:

Refer to Section VII. and VIII. of the Lab Manual for specimen collection and sample acceptability/rejection criteria.

A. Specimen Labeling:

To ensure adequate patient specimen integrity and positive identification using two patient identifiers throughout the pre-analytical, analytical, and post-analytical process, each specimen obtained must be labeled, when applicable, with the following information:

1. Complete patient name
2. Complete Social Security number
3. Date and Time of Collection
4. Initials of person who collected specimen

The specimen must be labeled immediately at the bedside in front of the patient, if applicable, or at the time it is obtained, to avoid mislabeling.

B. Specimen Integrity:

1. Capillary blood specimens for whole blood glucose must be tested immediately, as described in the appropriate test procedures.
2. Fresh whole blood drawn for ACT must be tested immediately, as described in the appropriate test procedure. Specimens with a hematocrit <20% or >55% are not recommended. If sampling through indwelling IV lines, flush access port thoroughly following the test procedures.
3. Ionized calcium samples must be drawn in a sodium heparin (green top) tube, placed on ice immediately, and assayed within 3 hours of collection.
4. Arterial and venous whole blood for blood gases must be collected in a heparinized syringe. Use a “safePICO Aspirator” when collecting from a line and a “safePICO syringe Self-Fill” when collecting from an arterial puncture. The blood sample must be mixed immediately after collection and before it is introduced into the analyzer to ensure its homogeneity. The specimen must remain at room temperature and should be analyzed IMMEDIATELY (within

Paper Copies are not Document Controlled

30 minutes).

5. Specimens for whole blood Oximetry should be obtained from an arterial line, arterial puncture, or venipuncture and tested immediately. Specimens collected in a non-heparinized tuberculin syringe must be tested immediately. Specimens can be collected in a heparinized blood gas syringe. Expel all air bubbles from the syringe, remove collection needle, and cap or seal the end of the syringe (if not tested immediately). Collect whole blood samples in a sodium or lithium heparin (light green top) tube or an EDTA (lavender or pink top) tube. A minimum of 1-2 mL is required for testing. Immediately mix the sample completely by rolling the tube or syringe between the palms of your hands for 10 seconds.

6. Specimens for iSTAT creatinine and troponin-I testing performed in Radiology and ED, respectively, are collected in a Lithium Heparin 4.5 mL tube (LGT). Specimen is mixed 8-10 times and tested within 30 minutes.

   NOTE: For ancillary testing not covered in 1-5 above, see specific test procedures for specimen collection/acceptability requirements. Clotted, hemolyzed or samples collected in the incorrect container are not acceptable for testing.

IV. TEST RECORD REQUIREMENTS:

A. Result Reporting:

To ensure reliable identification of patient specimens as they are processed/tested and to assure that accurate results are reported, each testing site must establish and maintain a record system. The record system, whether an electronic or written record, must include the following:

1. The date and time of specimen collection and/or testing.

2. The accession number or other identification of the specimen.

3. Notation of the condition and disposition of specimens that do not meet the laboratory criteria for acceptability.

4. The identity of the person who performed the test.

5. Test results.

6. Units of measurement.

7. Location where test was performed.

8. Reference ranges.

9. Name and address of testing laboratory.

   Results must be sent promptly to the authorized caregiver or to the individual responsible for using the results. Patient confidentiality must be assured throughout.

   - The patient's medical record may be used as a requisition as well as a test record as long as all of the requirements for each are entered in the patient's chart.
   - The test record and test requisition or an exact duplicate must be retained for a minimum of 2 years and, at the time of testing, must be available to the testing site and available to regulatory inspectors upon request.

B. Correction of Erroneous Result Entry:

The following remedial actions are required when erroneous results are reported:

Paper Copies are not Document Controlled

1. Erroneous results of significant deviation will initiate provider notification by phone. A result of a significant deviation is one that changes the result from a normal result to an abnormal result, or an abnormal result to a normal result.

2. Correct the erroneous result of significant deviation and promptly notify the authorized caregiver ordering the test, or the individual responsible for using the test result, that a reporting error has been corrected. Document notification in the comment section of the patient report. Include the notified provider's name/title, date/time, and operator initials in the comment section.

3. Verify corrected results promptly in VistA. A change in a result will automatically cause a comment, "___incorrectly reported as___" to appear in the patient report for each test corrected. This computer generated comment must not be deleted.

4. Maintain the original report as well as the corrected report for two years.

V. CRITICAL (PANIC) VALUES:

See list of critical values (pages 22-23)**.**

When a critical value is observed, it is the testing personnel's responsibility to call or deliver the result to the responsible caregiver. The testing personnel must document on the test report the test, the person/title notified, the date/time of notification, operator initials, and that accurate read-back of the value was done.

Note: All critical values must be repeated. A critical value that is inconsistent with the patient's medical history may be confirmed by testing in the main laboratory at the provider's discretion.

VI. QUALITY CONTROL

A. To ensure the accuracy and reliability of patient test results and reports, each lab must:

1. Follow manufacturer's instructions for instrument operation and performance.

2. Prepare and use a procedure manual. All procedures in the Pathology and Laboratory Medicine Service's Proquis Document Control System will be written in compliance with CLSI QMS02-A6 guidelines.

3. Perform and document instrument calibration/calibration verification (where applicable) at least every six (6) months.

4. Perform and document Quality Control. Patient testing may not be performed or results reported when QC results are out of range.

5. Document that remedial action has been taken when problems or errors are identified.

B. Quality Control documentation must be retained for two (2) years.

1. All reagents must be stored according to manufacturer's instructions and are not to be used past their expiration date.

2. Components of reagent kits of different lot numbers are not to be interchanged unless specified by the manufacturer.

3. Control samples must be tested in the same manner as patient samples.

4. Control results must meet the monitoring criteria prior to reporting patient test results.

VII. PATIENT SELF-MONITORING:

Paper Copies are not Document Controlled

When patients are in a VA inpatient or ambulatory care setting, they may NOT perform self-testing using their personal testing device.

VIII. SUPPLIES:

A. Glucose test strips, glucose QC solutions, BinaxNow Covid-19 kits, and blood gas syringes are obtained through Logistics. The Ancillary Testing Coordinators order the glucometer rechargeable batteries from the vendor.

B. Subspecialty ancillary testing sites purchase reagents and supplies from their own fund control points.

C. Supplies for ACT, Blood Gas, Clinitek, iStat, Oximetry, hCG, KOH prep, and fecal occult blood tests are provided by P&LMS.

IX. VENDOR POLICY:

A. Vendors who market laboratory test kits, reagents, or instruments are required to present any new items to Pathology & Laboratory Medicine Service for regulatory review, evaluation, and recommendation prior to VANTHCS's purchase or acquisition of such items. Vendors who make initial contact with personnel at ancillary sites should be referred to P&LMS.

B. Any questions or concerns should be forwarded to an Ancillary Testing Coordinator at extension 70713, 73697, 74923, or to the Assistant Laboratory Manager, extension 73369.

Paper Copies are not Document Controlled

AUTOPSY

HOURS: 8:00 a.m. to 3:00 p.m., Monday-Saturday

TELEPHONE: Pathology Resident on-call pager 214-759-3341

Transcription office – Extension: 70677/74227/70668

LOCATION: Bldg. 2J-Clinical Addition Basement, Room BB-405 (Autopsy Suite)

SUPERVISOR: Shayla Powell, MLS (ASCP)CM Extension: 70659

DIRECTOR: Bradford Barker, M.D., Extension: 70712, pager: 214-759-2232

TRANSCRIPTION TEAM: Extension: 70677

I. GENERAL INFORMATION:

An autopsy should be considered for all patients who die after having been admitted to the Dallas VA Medical Center. The autopsy is an important quality assurance activity. An autopsy will be performed by the Department of Pathology provided that:

A. The events leading to a patient's death do not place the patient in the jurisdiction of the Dallas County Medical Examiner, and

B. A valid witnessed permit (SF 523) has been obtained (see VANTHCS Memorandum 11-15: Post-mortem Examination).

Autopsies are performed at no charge to the family of the deceased. The autopsy results are posted in CPRS (reports, Anatomic and at Pathology, Autopsy) summarized in a letter sent to the family after the completion of the final autopsy report. The final autopsy report may also be sent to the family if so requested in the autopsy permit.

Autopsies may, under some circumstances, be performed on patients who did not die at the VA Medical Center. These requests should be discussed with Medical Administration Service, Office of Decedent Affairs, at extension 71399 and cleared by the Chief of Staff, extension 71150.

Limited autopsies or special requests such as needle biopsies of the liver, lung, or neoplasms may be requested, and may yield important information. Valid signed permits are still required for these autopsies.

Autopsies are performed 6 days a week (Monday thru Saturday) with the usual hours of autopsy being 8:00AM to 3:00PM. After 3:00PM, the autopsy will be performed the next business day. Autopsies will not be performed on Sundays unless circumstances are such that the autopsy cannot be performed on the following Monday. The on-call staff pathologist must be contacted to approve such a request.

Clinicians are strongly encouraged to discuss the case with the pathologist(s) prior to the actual autopsy.

The clinical service caring for the patient at the time of death is responsible for notifying Decedent Affairs of the need for autopsy, delivering the valid, witnessed and signed permit to Decedent Affairs/AOD, transporting the body to the morgue cooler, and for signing the morgue check-in record book that includes the following entries: Patient's name; date; time; ward; and signature of personnel who transported the body. Contact the AOD (ext. 71340) Monday-Friday after 4:30 p.m., weekends, and holidays for keys to the morgue cooler.

II. AUTOPSY RESULTS:

A list of Preliminary Anatomic Diagnoses (PAD) is available within 24 hours of the time the case is

Paper Copies are not Document Controlled

reviewed by the attending pathologist.

Final autopsy reports are completed within 30 calendar days. Complex cases requiring special studies or consultation may require up to 90 calendar days for completion (see VANTHCS Memorandum 11-15: "POST MORTEM EXAMINATIONS").

III. PERMISSION FOR AUTOPSY (ACQUIRING A VALID AUTOPSY PERMIT):

A valid autopsy permit consists of a SF-523 "Authorization for Post-Mortem Examination" appropriately filled out, bearing the signatures of the legal next of kin, the physician, and two witnesses who are medical center employees. See Post-mortem Examination policy VANTHCS Memorandum 11-15, for complete details.

Questions regarding autopsy permits should be directed to the Decedent Affairs Officer assigned to Medical Administration Service (MAS), the Staff Pathologist assigned to the Autopsy Service, or the on-call pathologist after hours. The Decedent Affairs Officer can be reached at ext. 75399 (in-house) or 214-857-3399 (external direct dial) from 8:00AM to 4:30PM, Monday thru Friday and at ext. 71340 after hours and on weekends. The staff pathologist can be reached directly (homepage phone list or on-call roster) or through the hospital operator.

Consent for an autopsy is deemed sufficient when given by the following: spouse; or if no spouse survives, his child; or if the child is a minor, the legal guardian of said minor. In the event that neither spouse nor child survives a deceased, permission for an autopsy is valid when given by the following in the order stated: father, mother, guardian or next of kin. In the absence of any of the foregoing, permission may be given by any person assuming custody of and responsibility for the burial of the body of the deceased. The source of information concerning legal divorce or court-appointed guardians of minor children should be provided in writing on the "Authorization for Post-Mortem Examination", SF-523, whenever such questions arise. With an unmarried person without next of kin, a statement of the source of information is also requested. If, at the time of death, the legal next of kin is not available to sign the autopsy permit, permission may be obtained by fax or by phone. The Medical Administrative Services office must assist with fax and phone permits as there must be a recorded three-way conversation with the family member, the decedent's physician, and a Medical Administrative Officer on duty to appropriately prepare a transcribed, witnessed autopsy permit.

Any and all restrictions limiting the complete autopsy must be clearly stated on the permit. These restrictions must also be clearly stated in the fax or phone-obtained, transcribed permit.

Families requesting a copy of the autopsy report must complete the appropriate section on the SF-523: Autopsy Request form.

IV. MEDICAL EXAMINER CASES:

Hospital deaths of the following types should be immediately reported to the Dallas County Medical Examiner's Office by the treating physician:

A. All cases in which the deceased is dead on arrival (DOA).

B. Cases in which an individual expires within 24 hours following admission to the Emergency Department or ward.

C. When death is, or is suspected to be, from accidental, suicidal or homicidal causes, no matter how long the person has been hospitalized or has survived the injuries. The time span may run from minutes to years.

D. Cases of anesthesia death, including those under initial induction and those who do not recover following anesthesia.

E. Deaths that occur during, following, or as a result of any diagnostic or therapeutic hospital procedure.

Paper Copies are not Document Controlled

F. Any death where the disease process responsible is either work-related or suspicious for being aggravated or accelerated by work-related activity.

Upon notification of the death, the Medical Examiner will investigate the case and will either accept the case or release the case for hospital autopsy. Indicate the "no case" number in the patient's chart and on the autopsy permit in the appropriate section. If the case is released by the Medical Examiner, a valid autopsy permit must be obtained as outlined previously, in order to perform the autopsy VANTHCS. The Decedent Affairs Office (75399) is available to assist with permits and required preparation.

Paper Copies are not Document Controlled

BLOOD BANK
(TRANSFUSION MEDICINE)

TELEPHONE: Extensions 70720/70725/70683

LOCATION: Clinical Addition, 1B-306

SUPERVISOR: Sun Y. Son, MT(ASCP)SBB, Extension: 70727

MEDICAL DIRECTOR: Daniel R. Nussenzveig , M.D., PhD, Extension: 71269

TRANSFUSION MEDICINE PATHOLOGIST ON CALL:

Contact Transfusion Medicine Unit - Extension: 70720/70725

I. GENERAL INFORMATION:

A. The Transfusion Medicine Unit (TMU) is open 24 hours a day. **Staffing between 4:00 p.m. and 8:00 a.m., as well as weekend and holiday coverage, is for emergency service only.**

The VAMC-Dallas TMU is a member of, and accredited by the AABB, and is governed by Dept. of Veterans Affairs directive and Handbook 1106.01. It is also registered with the Food and Drug Administration as a Transfusion Service. To maintain accreditation, procedures pertaining to blood components must be strictly followed, even in emergency situations.

To prevent ABO-incompatible transfusions, the protocol for proper patient, blood sample, and unit identification at the time of phlebotomy (sample acquisition), at the time of issue of blood component, and when the transfusion is given **must be strictly followed**.

II. AVAILABLE PROCEDURES:

A. Type and Screen (T&S):

1. Determination of ABO and Rh blood types and pre-transfusion screening for unexpected red cell antibodies. Any antibody detected will be identified, and reports of auto- or allo-antibody(ies) will be reported to the patient's provider and documented in a report for the medical record (see Blood Transfusion Warning in upper right corner of Cover Page in CPRS).

2. Recommended for those situations when transfusion is a possibility, but unlikely to occur.

3. No blood components will be set-up, but can be made ready within 5-10 minutes should transfusion become necessary.

4. Recommended for elective surgical procedures that "statistically" demonstrate negligible blood usage. Refer to Maximum Surgical Blood Order Schedule (MSBOS).

B. Blood Component Orders:

1. Used for those elective surgical procedures that "statistically" require transfusion during the course of the procedure and all other situations when a transfusion is required (refer to MSBOS).
2. Type and screen is required.

C. Antiglobulin Tests: Direct (DAT) and Indirect (IAT)

1. DAT. Order Direct Antiglobulin Test in CPRS. Under Blood Bank Orders select "Pre Op Orders (VBECS)", then select "Other Blood Bank Tests"→Diagnostic Tests (right side of window), click the drop-down window and select "Direct Antiglobulin Test".

Paper Copies are not Document Controlled

- Used to determine the existence of antibodies (auto- or allo-) attached to the patient's red cells.

- May be used in cases of suspected autoimmune hemolysis, delayed hemolytic transfusion reaction, or drug-induced hemolysis.

- Antibody identification may require a detailed medical history including drugs consumed within the last several months.

2. IAT. Order as "Antibody Screen" in CPRS as in C.1. above. Select "Antibody Screen" from the drop-down window under diagnostic tests.

   - Used to determine the existence of unexpected red cell antibodies in the patient's plasma or serum that could cause reactions if blood products are transfused.

   - All antibodies will be identified and reports of any antibody (either auto- or allo-) will be documented in a report for the medical records.

D. Presurgical Screen: Outpatients Only-Order in CPRS: Under Blood Bank orders select "Pre Op Orders", select "Outpatient PreSurgical Screen". Select collection type and select BOTH date/time wanted and collection date/time. Both of the "wanted" and "collection" dates/times need to be the date of the PreSurgical appointment. **Inpatients-**Order T&S in CPRS.

1. Used for outpatients scheduled for surgical procedures requiring the possible use of blood components. Concurrent orders for both ABO/Rh, ABS, and T&S will be combined onto one order by the computer and cannot be used for separate collections/samples. Place order for T&S on day of admission.

2. Should be ordered and drawn during the patient's pre-operative evaluation period.

3. This pre-admission blood bank sample **cannot and will not** be used for transfusion purposes.

E. Therapeutic Phlebotomy:

1. Therapeutic Phlebotomy services for ambulatory patients are referred to Carter BloodCare (CBC) for collection. No fee will be charged to patients who are approved by VANTHCS providers.

2. An ordering provider must complete and submit VANTHCS Therapeutic Donor Request form (SDF801.03.01) and Special Donations Physician's Cardiac Clearance Release form (SDF801.03.02) to CBC by fax listed on the forms.

3. The service will be provided Monday through Friday at multiple Carter BloodCare donation locations throughout North Texas. The locations are listed on the attached brochure. An appointment can be scheduled by calling 817-412-5308.

4. Patients diagnosed with hereditary hemochromatosis (HH) or receiving testosterone replacement therapy (TRT) may qualify to have their units used for transfusion through special programs. Please contact the CBC Donor Notification department for additional information on these programs at 817-412-5603.

5. Emergency Therapeutic Phlebotomy procedures needed at this facility must be collected by the provider.

6. If you have questions regarding this matter, please contact Sun Son, Supervisory Medical Technologist (ext. 70727), Transfusion Medicine Unit (P&LMS) 113) for more information.

F. Autologous Donations/Transfusion:

Paper Copies are not Document Controlled

1. Autologous donations must be scheduled with TMU. TMU personnel will coordinate the collection of the blood with a designated AABB accredited donor center. Each participant (patient) will be limited to a deposit of no more than 4 units of packed red blood cells. The number of units collected may not exceed one unit more than the Maximum Surgical Blood Orders Schedule for the specific surgical procedure. The last unit must be collected no later than 5 days prior to the scheduled surgery.

2. The autologous donor-recipient must meet the established AABB standards for autologous donors. Exceptions must be approved by the Medical Director of the designated donor center. The donor-recipient must also sign a consent form which includes permission for testing for, but not limited to, the following infectious agents: syphilis, HTLV-I/II, hepatitis B, hepatitis C, HIV-1/2, and WNV (West Nile Virus). The collecting facility will charge the autologous donor a handling fee to be paid at the time of donation. For further information call (214) 857-0725.

G. Voluntary Blood Donations:

1. Voluntary blood donation services are not available at this facility.

2. It is highly recommended that persons wishing to donate blood do so at one of the many community blood donor collection centers in the area.

H. Directed Donations/Transfusions:

1. Requests for directed donations to a patient will be discouraged due to the lack of evidence supporting the theory that directed donations are safer than homologous blood donations. Due to increased clerical tasks, directed donations may actually increase the risk of transfusion error.

2. The patient's attending physician, the Medical Director of TMU, and the Chief of Staff must agree that it is in the best interest of the patient to receive blood from directed donors.

3. Prospective donors will be sent to a designated AABB accredited donor center for collection, processing, and distribution of blood. The directed donor must meet the established AABB, FDA, and collection center standards for homologous blood donors. All directed donor blood will be irradiated to reduce the risk of transfusion-associated graft vs. host disease. The collecting facility will charge the directed donor a handling fee to be paid at the time of donation. For further information call (214) 857-0725.

III. AVAILABLE BLOOD PRODUCTS:

A. Red Blood Cells Leukocyte Reduced:

1. Component of choice for red blood cell transfusions.

2. Red Blood Cell component orders require crossmatch testing to determine compatibility of donor cells with patient serum/plasma.

   a. EXM (electronic crossmatch). Computer selection of ABO/Rh compatible units is allowed for patients without current or previous history of antibody detection/identification entered in computer. Blood units will be ready for issue within 5-10 minutes.

   b. GEL (AHG crossmatch). TMU performs testing of donor cells with patient serum using Gel technique. Gel technique is indicated when the patient has a positive antibody screen entered in computer from current sample or has a computer history of antibody detection/identification. Donor units must be screened and found negative for any significant antigens identified during antibody identification. Testing may take 1-4

Paper Copies are not Document Controlled

hours.

3. Units must be transfused within 4 hours of issue.

4. For patients at risk for circulatory overload, please contact the Transfusion Medicine Unit staff to request low volume units.

B. Irradiated Components (Red Blood Cells, Platelets, Pheresis):

1. To prevent the occurrence of transfusion-associated graft-vs.-host disease (TA-GVHD).

2. Requires Hematology-Oncology staff physician and/or pathologist approval.

3. Usually requested in following situations: autologous or allogeneic hematopoietic stem cell transplant patients, directed donors, family members, HLA-matched platelets, and selected Hematology-Oncology patients (Refer to VANTHCS Guidelines for Irradiated Cellular Blood Component at https://r02v17webpqs01.v17.med.va.gov/ntxlive/viewdocument.aspx?docno=tmu-tuc.0000.).

C. Red Blood Cells Deglycerolized:

1. Rare units of frozen blood are available upon special request. Contact the Transfusion Medicine Unit.

2. After deglycerolization and washing, the unit has a 24-hour expiration.

D. Washed Components (Red Blood Cells Washed, Platelets, Pheresis Washed):

1. Available for special cases upon request.

2. Requires approval by Hematology/Oncology physician and/or Medical Director of Transfusion Medicine Unit.

E. Thawed Plasma:

1. Thawed fresh frozen plasma (FFP) or plasma frozen within 24 hours of collection will be issued as thawed plasma.

2. Thawing takes approximately 20-25 minutes. Thawed plasma expires 5 days after thawing. These products are available for the treatment of coagulation factor deficiencies other than Factors V and VIII.

3. The units must be infused within 4 hours of issue.

F. Platelets, Pheresis Leukocyte Reduced:

1. For patients with decreased platelet count and/or platelet dysfunction **and** who are bleeding or undergoing surgery or invasive procedures.

G. **Cold Stored Platelets (CSP):** Being produced by Carter BloodCare under an FDA variance for use in bleeding patients.

1. CSP are approved for the treatment of actively bleeding patients.

2. CSP may be used when conventional platelet products are not available, with approval from the TMU Medical Director and/or the Provider.

3. CSP should not be used for prophylactic (under normal conditions) treatment.

Paper Copies are not Document Controlled

4. CSP are stored at refrigerated temperatures (1-6°C).

5. CSP are stored up to 14 days without agitation.

6. Bacterial detection testing is not required.

H. Cryoprecipitated AHF:

1. To correct for factor XIII deficiency, fibrinogen deficiency, or for use in making fibrin glue.

2. It is indicated in hemophilia A or von Willebrand's disease **only** when virus-inactivated concentrates are not available.

3. Cryoprecipitate is stored frozen in pools of 5. The usual dose is two pools of five units.

4. Once thawed, it expires in 6 hours.

IV. REQUEST FOR BLOOD COMPONENTS:

A. Routine Blood Component Requests:
All orders for Type and Screen and/or Blood Component orders must be entered in CPRS. Go to "Orders Tab"→"Blood Bank Orders"→Select appropriate type order. Select from "Transfusion request" (generates nurse's order to transfuse-not to be used for Pre-Op orders), "Pre-Op" orders, or "Intra-Op" orders.

1. Check in the computer (CPRS-LAB-Blood Bank) to determine if a blood sample is required. Look under "diagnostic test". If there is a sample within the last 3 days with no comment associated, no sample is needed.

   If a blood sample is needed, the blood sample must be collected as stated in 2 below.

   a. For packed red blood cells, a blood sample is needed every 3 days.

   b. For other blood components, a recent **(during current admission)** record of the patient's ABO and Rh blood types will suffice for the duration of current admission.

   If no blood sample is required, a request only for the component needed may be entered in CPRS.

2. T&S or Blood Component orders requiring sample collection must have the sample submitted as follows:

   a. Every sample will be drawn only from a patient wearing a hospital identification armband and will be submitted with an appropriately completed Blood or Blood Component Transfusion Form (SF-518) that is stamped, legibly handwritten, or with patient ID labels affixed to the SF-518 with the patient's full name and full social security number. Section I must be completed and both the collector and verifier MUST SIGN or LEGIBLY print his/her name on the SF-518 at the bedside when the patient's sample is collected, attesting that they have verified at the bedside that the information on the patient armband, the sample label, and the SF-518 match exactly.

   b. The samples for compatibility testing will be drawn by physicians or physician designees; i.e., medical students, physician assistants, authorized nursing personnel, and inpatient phlebotomists with nurse verifier. A second physician, physician assistant, or nursing personnel MUST verify the blood sample collection. **Medical students may not serve as a verifier for another medical student.**

Paper Copies are not Document Controlled

1) A blood specimen (pink top or large, lavender top [EDTA]) labeled with the patient's full name and full social security number, date and time collected, and the initials or signature of the collector.

2) All transfusion samples must be delivered to the TMU by responsible personnel.

3) TMU staff will receive the sample, accept the request in the computer, and enter appropriate information.

c. If an unacceptable blood sample or SF-518 is delivered to the Transfusion Medicine Unit, the Transfusion Medicine Unit will retain both the blood sample and SF-518. A new blood sample and SF-518 must be submitted if any of the following apply:

1) The patient's full name and social security number do not match on the blood specimen label and the SF-518 and/or CPRS.

2) The blood specimen or SF-518 are unlabeled.

3) If required information from above (date, time, collector and/or verifier names) is absent, the sample may be rejected or accepted at the discretion of the TMU supervisor or designee.

3. Elective surgical requests

a. *Outpatients* scheduled for surgical procedures requiring the possible use of blood components should have PreSurgical Screen ordered and drawn *during their pre-operative evaluation period (not on the day of admission)* (VANTHCS MCP 112-01 Presurgical Screen (ABO/Rh and Antibody Screen) on Outpatients Scheduled For Surgical Procedures).

1) The sample required is a pink top tube or a large (10 mL) lavender top tube. These tests can be ordered in the computer and a bar-code label will be generated for blood sample collection. No SF-518 is required.

2) *This pre-admission sample will allow for the determination of the ABO/Rh and red cell antibody status of the patient. If the patient has a rare blood type and/or unexpected red cell allo/auto-antibody present, the attending physician of the month for the respective surgical service will be notified and the Transfusion Medicine Unit will have sufficient time to acquire compatible red blood cell units for the patient prior to admission for surgery.*

3) This pre-admission blood bank sample **cannot and will not** be used for transfusion purposes.

4) A new blood sample with the accompanying Blood or Blood Component Transfusion form (SF-518) for a "Type and Screen" **must** be drawn according to hospital protocol and submitted to the Transfusion Medicine Unit as soon as the patient is admitted.

5) If the preoperative evaluation occurs no more than 3 days prior to the scheduled surgery, and if the patient will agree to wear an armband from that day until after the surgery, the surgical service may obtain an armband from admitting for that patient, put it on the patient, order in CPRS, and submit a sample for preoperative Type and Screen with the accompanying SF-518 form instead of the Presurgical screen. Patients must wear their hospital armband while out of the facility. If they do not, a new blood specimen, and SF-518 will be required for crossmatching and releasing blood products. The patient's hospital armband is used in identifying patients when collecting blood samples for crossmatch purposes and prior to the administration of blood components.

Paper Copies are not Document Controlled

b. *Inpatients* who might require transfusion, or are scheduled for surgery, should have "Type and Screen" ordered in CPRS and a blood sample submitted with an accompanying SF-518 as soon as they are seen. **Type and Screen samples for inpatients scheduled for elective surgery should be received in the Transfusion Medicine Unit no later than the day before surgery.**

1) The ordering physician will be notified if a rare blood type and/or unexpected red cell antibodies are detected. An appropriate number of compatible units will be made available for surgery.

2) This "Type and Screen" sample can be used for 3 days from the time it is drawn.

3) CONVERSIONS**:** Transfusion Medicine Unit may be called to set up additional units of red cells should blood become necessary during the surgical procedure. **However**, these orders **must** be placed in CPRS before Transfusion Medicine staff can accept and process those orders for issue.

4) After 3 days, a new request form (SF-518) and patient sample are required for additional crossmatches.

c. All elective surgery patients will be managed under Maximum Surgical Blood Order Schedule (MSBOS) guideline (TMU.0138). Override capabilities are available in order to obtain additional blood for surgery to manage patients having unusual circumstances. *To override the MSBOS, a staff physician must state the reason for the override in the CPRS order.*

d. Transfusion requests for patients known to have alloantibodies or autoantibodies should be communicated to the Transfusion Medicine Unit at the time the patient is scheduled for surgery (see "Blood Transfusion Warning" on top right corner of the patient's CPRS cover page).

e. If the workload or problem crossmatches prevent Transfusion Medicine Unit from finding compatible blood when the blood is ordered on the day of the surgery, the surgeon will be personally notified and will make the decision to cancel or delay until compatible blood can be found.

f. OR staff will send a messenger to Transfusion Medicine Unit with the patient's ID labels or OR Schedule to pick up all blood orders.

4. Patients released on pass must wear their hospital armband while out of the facility. If they do not, a new blood specimen, and SF-518 will be required for assigning and releasing blood products. The patient's hospital armband is used in identifying patients when collecting blood samples for crossmatch purposes and prior to the administration of blood components.

5. The physician requesting blood components for a patient is required to obtain a properly executed informed consent (VANTHCS Memorandum No. 11-04: Informed Consent for Clinical Treatments and Procedures) from the patient for the transfusion of any blood components.

   Properly executed informed consents (iMEDConsent or paper consent) for inpatient transfusions are valid until either a period of 60 calendar days or discharge, whichever comes first.

   Properly executed informed consents (iMEDConsent or paper consent) for outpatient transfusions are valid until either completion of an order for blood transfusion or a period of 60 calendar days, whichever comes first.

Paper Copies are not Document Controlled

a. Exceptions for obtaining written consent where life-threatening situations are encountered require the application of VHA Handbook 1004.01 (Informed Consent for Clinical Treatments and Procedures).

b. Refusal of consent to transfusion and the reasons for such a refusal, e.g. religious background, etc., should be documented in the patient's chart. The implication of such a refusal and possible alternative forms of therapy must be carefully explained to the patient or patient's surrogate.

6. All routine urgency orders should be collected and delivered to the Transfusion Medicine Unit between 6:00 a.m. and 3:00 p.m.

7. Emergency surgery and all ward requests: These requests will be honored at all times. However, there may be delays due to antibody problems or critical shortages. If unavoidable delays are encountered in finding compatible blood, the technologist will notify a responsible physician. If the physician cannot be located, a message will be left with the patient's nurse.

8. Under normal circumstances, an EXM for patients with no antibody history and current T&S for 2-6 units can be ready in 5-10 minutes. Patients with unexpected red cell antibodies will require much more time.

9. Requests for certain numbers of units to be crossmatched and held "at all times" will not be honored. A physician should order only the amounts of blood to be utilized. If additional units are needed, they may be requested any time during a 3 day period within which the initial T&S sample is valid for transfusion purposes.

10. If an antibody problem is detected, TMU staff may require additional blood samples, a diagnosis, a transfusion history, a list of recent medications, and/or a prescription from the physician assuming responsibility for transfusion of incompatible blood.

11. Any deviations from the above procedures require the approval of the Medical Director, Transfusion Medicine Unit, Pathology & Laboratory Medicine Service, or the pathologist on call.

B. Emergency Blood Component Requests:

1. In instances where delay of transfusion could jeopardize the patient's life, uncrossmatched blood components may be requested.

   a. The patient's physician must note in the medical record the medical necessity for the transfusion of uncrossmatched blood components, and place orders in CPRS for Type and Screen, if needed, and blood component requests.

   b. A **signed/dated prescription or waiver (available in TMU)** is required for any uncrossmatched blood components. The following information must be present on the prescription or waiver:

      1) Patient's full name and full social security number.

      2) The statement, "Issue uncrossmatched blood immediately, patient's life will be jeopardized by delay for crossmatch."

   c. Properly labeled blood specimen (pink or large lavender top tube) should be sent to the TMU as soon as possible with a properly completed SF 518.

   d. Upon receipt of a proper blood sample and SF-518, crossmatches will be immediately performed on all issued and requested blood components.

Paper Copies are not Document Controlled

1) If an incompatible unit is identified, the Transfusion Medicine Unit will immediately notify the patient's physician.

2) If the component has not been transfused a compatible component will be substituted.

2. If any reaction occurs during the transfusion of an uncrossmatched blood component unit that could be related to incompatibility, **the transfusion must be stopped and the Transfusion Medicine Unit notified immediately of the problem.**

3. Patients whose ABO and Rh blood types are unknown, or who do not have ABO/Rh results from two different collection tubes, will receive group 0, Rh-negative leukocyte reduced red blood cells and/or group AB plasma.

4. If emergency needs for Rh-negative units exceed the available inventory in the Transfusion Medicine Unit and alternative types or additional units cannot be obtained, the Transfusion Medicine Unit will notify the ordering physician and issue crossmatch compatible Rh-positive units until the emergency episode is over. In the case of women of childbearing age (<50 years old), the need for Rh-immunoglobulin will also be assessed by the ordering physician and TMU Medical Director.

V. ISSUE OF BLOOD COMPONENTS:

A separate order for Nursing Administration must be placed in CPRS when the decision to transfuse is made.

A. Blood components will be issued only to a transporter wearing a Medical Center ID badge. The transporter will deliver the blood components promptly.

B. The transporter must bring a printout of the physician component order (or an index card/label during downtime) bearing the patient's full name, full social security number, number and type of blood components desired, and the date required. *The printout or index card/label must have the signature/initials of the primary nursing care provider who will initiate the blood transfusion.* The transporter may be required to verbally confirm this data with a member of the TMU staff. **Blood will not be issued if any discrepancy is noted**.

The Operating Room (OR) staff may use the printed surgery schedule or patient ID labels to pick up blood component(s). The OR staff will sign the Blood Transfusion Record Form (BTRF) for each component(s) taken to the OR refrigerator.

C. Routinely, only one unit of blood component will be issued for each patient at a time with the following exceptions:

1. Surgery: Red blood cells will be issued for all posted elective surgery patients on the morning of surgery and will be stored in the OR monitored refrigerator.

2. ICUs & ED – Routinely no more than 2 units/patient will be issued at one time to CCU, MICU, TICU, SICU, and ED. Two separate intravenous accesses must be available for transfusing two units of blood component at the same time. Exceptions will be reported to the TMU Medical Director and Supervisor for review.

3. Hemodialysis: All units that are to be administered simultaneously for one patient may be issued.

4. In cases of extreme life-threatening emergency need for large volume of blood products, multiple units may be issued at a time to any ward. There **MUST** be an order in CPRS for each blood component type (PRBC, FFP, Platelet and Cryoprecipitate), and the Quick CPRS order for "Large volume transfusion protocol for life-threatening bleed" may be used. Additional units may be added to each of these orders without the need for orders being

Paper Copies are not Document Controlled

placed in CPRS by the provider until the emergency is resolved. However, the OR/ward personnel MUST keep TMU aware of actual product need by calling x70720 so TMU personnel can anticipate preparation of additional products. To ensure patient safety and avoid blood product wastage, TMU recommends a maximum of six (6) units of red blood cells and four (4) units of plasma products (platelets, plasma, and/or cryoprecipitate pool) to be issued at a time, but more may be issued if necessary and available. These blood products must be transported directly to the room where the patient is located, and blood products must not be placed in a common area. Any unused blood products must be returned to TMU immediately after the crisis. All PRBC's, CSP and TP will be considered wasted unless acceptable return criteria has been met upon return. Platelets or Cryoprecipitate (not expired) may be returned to inventory if inspection is acceptable.

D. Red blood and CSP cells must be stored ONLY in refrigerators that are monitored by TMU.

E. Only pick-up blood components that are very likely to be administered immediately. Blood components that are not immediately administered must be returned to Transfusion Medicine Unit.

F. Blood components must be transfused within 4 hours of issue. ANY BLOOD COMPONENT THAT IS NOT TRANSFUSED MUST BE RETURNED TO TRANSFUSION MEDICINE UNIT FOR PROPER DISPOSAL.

G. On occasions when no compatible red blood cells are available for transfusion (due to the presence of high frequency red cell alloantibodies and/or red cell autoantibodies) and a life-threatening situation arises, the TMU may elect to issue incompatible red blood cells. A prescription form or waiver (available in TMU), signed by the physician stating his/her complete comprehension of the situation and risk of transfusion with incompatible red blood cells, is required BEFORE ISSUE.

VI. ADMINISTRATION OF BLOOD COMPONENTS:

A. All patients requiring blood component transfusion must have properly executed informed consent (iMEDConsent or paper consent) documented in CPRS or in the chart on a standardized form prior to transfusion. The physician is responsible for obtaining the consent and completion of the form after appropriate discussion with the patient.

Properly executed informed consents (iMEDConsent or paper consent) for inpatient transfusions are valid for either a period of 60 calendar days or until discharge, whichever comes first.

Properly executed informed consents (iMEDConsent or paper consent) for outpatient transfusions are valid until either completion of an order for blood transfusion or a period of 60 calendar days, whichever comes first.

B. Before starting a transfusion, **two authorized personnel** must make certain that the recipient is the person named on his armband, on the caution tag attached to the blood bag, and on the Blood Transfusion Report Form (BTRF) by **verifying the following:**

- Full name and full social security number of the recipient
- ABO and Rh types of donor and patient
- Crossmatch results, if applicable
- Special Needs (such as Irradiation), if applicable
- Unit number of blood component, and
- Expiration date/time of unit

1. Two licensed and medically trained staff members must be involved in the verification process.

Paper Copies are not Document Controlled

2. The BTRF must contain the signatures of the two verifying persons in the appropriate spaces allocated.

3. At least one person identifying the patient and blood component **MUST** start the transfusion, and must record both the pre-transfusion vital signs and the 15-minute vital signs on the BTRF.

4. Normal saline (0.9% NaCl) is the ONLY solution suitable for use with the transfusion of blood products.

5. All blood component transfusions should be completed within 4 hours of issue.

6. After completion of a successful transfusion, the transfusionist will complete the transfusion data information on the BTRF. The completed copy will be scanned in the patient's chart.

VII.SUSPECTED TRANSFUSION COMPLICATION:

A. STOP the transfusion IMMEDIATELY and keep the IV open using a new IV set and a new bag of normal saline.

B. Reverify patient and donor product identification.

C. Notify the physician and TMU (ext. 70720, 70725, or 70683).

D. Send the following to TMU if a possible transfusion reaction is suspected:

1. Copy of the BTRF for each implicated unit.

2. “Report of Suspected Transfusion Reaction" form completed by the physician. The physician will also order a Transfusion Reaction Workup in CPRS.

3. One properly labeled, –pink top or 10 mL lavender top tube. The adhesive label must include the patient's name, full social security number, date and time of collection, and initials or signature of the collector. The sample must be submitted with a properly completed SF-518 form.

4. First sample of urine obtainable after the suspected reaction occurred.

5. Implicated blood bag with transfusion set and all solutions attached. Clamp off lines and return with the BTRF to Transfusion Medicine Unit.

E. WHEN A TRANSFUSION REACTION IS REPORTED, ALL BLOOD CROSSMATCHED FOR THE PATIENT BEFORE THE SUSPECTED REACTION MUST BE RETURNED TO TRANSFUSION MEDICINE. **All blood components reserved for the patient will be returned to stock**. A new crossmatch will be performed on the post-reaction sample following investigation of the reported reaction. If additional blood is needed prior to completion of the investigation, it must be issued as UNCROSSMATCHED with signed CPRS waiver or signed/dated prescription AND pathologist approval.

F. Upon review by the Supervisor and Medical Director, additional tests may be ordered for further work-up and additional specimens may be requested.

G. Transfusion Medicine Unit will investigate the suspected transfusion reaction. In the event of a fatal transfusion reaction, a report will be made by to the Chief of Staff on VA Form 10-2633, "Report of Special Incident Involving a Beneficiary", and will be reported to FDA (CBER), The Joint Commission, and the VA Regional Medical Technologist who reports it to the National Enforcement Officer.

Paper Copies are not Document Controlled

CORE LAB – CHEMISTRY SECTION

TELEPHONE: EXTENSIONS: 70699, 70700

LOCATION: Clinical Addition, Rooms 1B-450 and 1B-451

SUPERVISOR: Rochelle Hurd MT(ASCP), Extension: 70711

LEAD TECHNOLOGIST: Kyla Manghnani , MLS(ASCP), Extension: 70670/73566
Caitlin Schroell, Extension: 70670/73566

CORE LAB CO-DIRECTORS: Ellen Araj, M.D., Extension: 70697
Daniel R. Nussenzveig, M.D., PhD, Extension: 71269

Paper Copies are not Document Controlled

I. GENERAL INFORMATION:

A. The Chemistry Section includes Chemistry, Therapeutic Drug Monitoring, Special Chemistry, Electrophoresis, Urinalysis and Medical Emergency drug screens. It is open 24 hours a day, 7 days a week.

B. All orders for chemistry tests are made through CPRS. Refer to VANTHCS Memorandum 113-05: Laboratory Computer Downtime Procedure for instructions for test ordering during computer downtime situations.

C. All specimens for Clinical Chemistry are delivered to the Client Services Unit (CSU), where accessioning is performed.

D. All in-house specimens for chemistry tests should be delivered to the laboratory within one (1) hour of the collection time. Exceptions include: ionized calcium, lactate, ammonia, and fluid pH, which must be delivered to the laboratory on ice immediately after collection and Cryoglobulin in warm water.

E. Results are entered into VistA as soon as possible after test completion.

F. See the General Laboratory Information section for the list of tests available as medical emergency.

G. Test orders for individual analytes are encouraged. Although some tests have been bundled into panels, such as an Electrolyte Panel or a Basic Metabolic Profile, any one test included in those panels can be ordered individually. For example, it is not necessary to order a Basic Metabolic Profile if only a potassium level is desired.

II. SPECIMEN COLLECTION:

A. The proper procedure for specimen collection is outlined in Guidelines for Laboratory Use Section VII, "Specimen Collection, labeling and delivery to the lab", Page 9.

B. Refer to the Index of Tests (yellow section) for specific test information.

III. URINALYSIS:

A. RANDOM (SPOT) SPECIMEN:

1. Urine specimens submitted for urinalysis are to be freshly voided, clean catch, midstream collections.

   MALES:

   a. Instruct the patient to wash hands and the end of his penis with provided towelettes, and let dry.

b. After allowing some urine to pass into the toilet, the patient should collect urine in the sterile wide-mouth container provided. Do not allow the inside or lip of the container to contact the hands or other parts of the body. A minimum of 10 mL must be collected. Recap the container. Wash hands.

c. The specimen should be delivered immediately to the laboratory. It can be stored temporarily in the refrigerator (2- 8°C); however, urinalysis must be performed within 2 hours of collection.

FEMALES:

a. Instruct patient to wash hands.

b. Instruct the patient to sit in a comfortable position on the toilet, swinging one leg to the side.

c. Have the patient spread the labial folds with one hand, and cleanse the area with provided towelettes.

d. After allowing some urine to pass into the toilet, the patient should collect urine in the sterile wide-mouth container provided. Do not allow the inside or lip of the container to contact the hands or other parts of the body. A minimum of 10 mL must be collected. Recap the container. Wash hands.

e. The specimen should be delivered immediately to the laboratory. It can be stored temporarily in the refrigerator (2- 8°C); however, urinalysis must be performed within 2 hours of collection.

2. Urinalysis is ordered in the computer as follows:

   Order "UA + Micro" for chemical tests and a microscopic examination. The microscopic examination will not be performed if the chemical tests are normal and the urine specimen is visually clear. The report will include this information.

3. Urine specimens are to be submitted <u>within 1 hour</u> of collection time and in a container labeled with the patient's full name, complete social security number, date and time of collection, initials of collector, and ward or clinic.

4. Acceptable containers for urine specimens are either a clean plastic cup (Outpatient phlebotomy samples), Yellow Top tube for urine (ED, Same Day Surgery), Speckled (red/yellow) Top tube for urine (CBOCs, Bonham/FWOPC sent to Dallas laboratory for testing), and/or Gray Top tube for urine (urine culture). **Specimens for urinalysis should not be submitted in the same container with specimens for urine culture as they are processed in different sections of P&LMS.**

5. **Rejection criteria:** Unacceptable specimens include specimens consisting of less than 2 mL total volume and samples received in lab after 2 hours of collection, unless stored refrigerated for up to 24 hours or collected in an approved urine preservative tube.

6. Specimens should consist of at least 10 mL for proper microscopic examination.

B. 24-HOUR URINE COLLECTION:

24-hour urine specimens for general chemistry are collected in a 24-hour container (brown jug obtained for inpatients through SPS) with no preservative. Some tests may require preservative. Container with preservative can be obtained from Client Services Unit. The specimen is to be labeled with the full name of the patient, complete social security number, date and time of the beginning of the collection period, and date and time of the end of the collection period.

Paper Copies are not Document Controlled

1. Instructions for the patient are as follows:

   a. During the collection period, the patient should drink the same amount of liquids as he/she usually does, unless otherwise instructed by the physician. The patient is to empty the bladder upon arising in the morning on the day the collection is begun. The date and time is to be recorded **(Do not collect this urine.)**

   b. During the day and night, the patient is to collect all subsequent urine in a clean container every time urination occurs. Each specimen is to be poured into the collection container.

   c. The final collection is made upon arising the following day; this time should be the same as on the day the collection was begun. This specimen is also poured into the 24-hour container. Again, record the date and time of the collection of the final specimen.

   d. The 24-hour container, containing all urine voided, should be kept refrigerated during the collection period.

2. The 24-hour specimen collection is to be delivered to the laboratory as soon as possible after the end of the collection period.

IV. THERAPEUTIC DRUG MONITORING:

A. The Therapeutic Drug Monitoring (TDM) tests include*:

amikacin
carbamazepine (Tegretol)
digoxin
gentamicin
lithium
phenobarbital
phenytoin (Dilantin)
theophylline
tobramycin
valproic acid (Depakene)
vancomycin

*acetaminophen, salicylates, and ethanol tests are also available.

B. Therapeutic Drug Monitoring is provided on a daily basis.

C. Acetaminophen, digoxin, lithium, phenobarbital, phenytoin, salicylates (ASA), ethanol, and theophylline are available as Medical Emergency requests, 24 hours a day, 7 days a week.

D. In the event of a major downtime of the TDM analyzer, requests deemed as medical emergency will be sent to a reference laboratory for testing with pathologist approval. All other samples will be retained and testing will be performed when the analyzer is operational.

V. ELECTROPHORESIS:

Electrophoresis includes protein electrophoresis for serum, urine, , Free Kappa and Free Lambda Light Chain. These tests are performed 2-3 times a week, depending on the volume. Samples received after 9 a.m. will be analyzed on the next scheduled run.

VI. SPECIAL CHEMISTRY:

Tests offered include: PTH (intact), TSH, FT4, PSA, Ferritin, B12/folate, CK-MB, BNP, Troponin-I, CEA, Cortisol, Testosterone, LH, FSH, AFP, serum proteins, Quantitative HCG, Estradiol Sensitive, and Hgb A1C.

- TSH, FT4, Testosterone, CEA, PSA, Ferritin, B12/folate, FSH, LH, and AFP are run Monday through Saturday.
- CK-MB, BNP, myoglobin, quantitative HCG, Cortisol, PTH(intact), and Troponin-I are run as

Paper Copies are not Document Controlled

requested, 24 hours/day, 7 days/week.

- HgbA1C is run 24 hours/day, 7days a week
- Serum Proteins are available as follows:
  -C3, C4, Haptoglobin, RF, Microalbumin, and Prealbumin are run daily.
  -hCRP is run Monday and Thursday.

VII. AFTER HOURS AND WEEKEND DRUG-OF-ABUSE TESTING:

A. The Clinical Chemistry Unit will provide, on a medical emergency basis, during the hours of3:30pm - 8:00am and on holidays and weekends, an eight-assay qualitative drug screen for true medical emergencies. The Emergency Drug Screen Panel consists of the following tests:

Amphetamines/Methamphetamines	Barbiturates
Benzodiazepines	Cannabinoids (THC)
Cocaine Metabolite	Phencyclidine
Opiates	Tricyclic

B. This panel is a qualitative screen only. Emergency drug screens are reported as "presumptive" positive. No confirmatory testing is performed unless requested by the physician with the exception of Amphetamine and PCP. Any test reported as positive can be confirmed upon request by the physician, but confirmation is only performed Monday-Friday, 0800-1530 (see Toxicology section).

Paper Copies are not Document Controlled

CORE LAB –HEMATOLOGY SECTION

TELEPHONE: EXTENSIONS: 70686/76628/76343

LOCATION: Clinical Addition, Room 1B-450

SUPERVISOR: Rochelle Hurd, MT(ASCP), Extension: 70711

LEAD TECHNOLOGIST: Kyla Manghnani MLS(ASCP, Extension: 70670
Caitlin Schroell, Extension: 73566

DIRECTOR: Daniel R. Nussenzveig, M.D., PhD, Extension: 71269

I. GENERAL INFORMATION:

The Hematology Section offers CBCs, automated and manual differentials, body fluid counts, post vasectomy semen analysis, urine eosinophil, malaria, erythrocyte sedimentation rate (ESR), and coagulation testing. It is open twenty-four hours a day, 7 days a week.
Note: Post-vasectomy semen analysis is performed on weekdays between 8 am and 3 pm.

II. ORDERING TESTS:

A. All hematology tests should be ordered by proper test input into CPRS.

B. The following procedures may be ordered as Medical Emergency status, and are available 24 hrs a day, seven days a week including holidays:

1. WBC, hemoglobin & hematocrit, and platelet count (WBC, H&H & platelets)
2. CBC without differential
3. PT and INR
4. PTT
5. Fibrinogen
6. D-Dimer
7. Cerebrospinal fluid cell counts

III. SPECIMEN COLLECTION:

A. The procedure for specimen collection is outlined in Section VII Specimen Collection, labeling and delivery to the lab.

B. See Index of Tests (yellow pages section) for specific test information. If the desired test is not listed, contact the Hematology Section, ext: 70686.

C. **Coagulation tests** are performed on citrated blood (blue top). The 9:1 ratio of blood to anticoagulant is critical for valid coagulation test results and must be maintained. The Blue Top evacuated tubes used for collection of samples for coagulation tests contain a vacuum of sufficient magnitude to aspirate a known quantity of blood (full tube). **Do not** underfill.

D. **Hemogram (CBC), ESR and Reticulocyte** count are performed on whole blood anticoagulated with EDTA (Lavender Top). A minimum of 2.0 mL whole blood is required.

Specimens for ESR must be less than 4 hours old; specimens for CBC and reticulocytes should be less than 5 hours old for optimum accuracy.

Paper Copies are not Document Controlled

E. Body Fluid Cell Counts:

1. **Fluid cell counts** must be performed **within 30 minutes after collection,** as cell lysis can begin within one hour after aspiration. Therefore, delivery to the laboratory must be immediate.

2. CSF must be collected in sterile screw-cap tubes. All other body fluids should be collected in either heparin (Green Top), or EDTA (Lavender Top) tubes. **Fluids submitted in syringes are not acceptable.**

3. At least 1.0 mL of fluid sample should be submitted. For **CSF**, the **last tube** (tube #4) should be used for cell counts because it has the least amount of peripheral blood contamination after a traumatic puncture.

F. Post-Vasectomy Semen Analysis:

NOTE: Urology Clinic contacts Core Laboratory (70686) to notify that they are sending a specimen.

1. The GU Clinic outpatient will be provided concise written instructions for the proper collection of the semen sample.

2. The specimen must be fully labeled with the patient's name and complete social security number, clinic location, and the date and time of collection.

3. Semen analysis (presence/absence of sperm only) must be performed within 2 hours after sample collection. Delivery to the laboratory CSU must be immediately after collection.

4. The Post-Vasectomy Semen Analysis (Presence/Absence) is performed weekdays (except holidays) only, between 8:00 a.m. and 3:00 p.m.

G. No tests will be performed on unacceptable specimens. Reasons for sample rejection include:

1. Clotted specimens.

2. Severely hemolyzed specimens.

3. Wrong tube or container.

4. Specimen too old.

5. Failure to meet volume requirements.

6. Improperly labeled specimens.

IV. SPECIAL COAGULATION REQUESTS:

A. Special coagulation studies, including factor assays, require approval by a staff pathologist prior to being sent to a referral laboratory.

B. Contact the Client Services Send Out area (ext. 70691) for instructions.

V. MALARIA SMEARS:

Blood, buffy coat, and bone marrow for demonstration of malaria, microfilariae, leishmania and trypanosomes.

Fresh capillary or venous blood or bone marrow must be used to prepare "thick and thin" smears.

Paper Copies are not Document Controlled

A. Malaria:

1. An EDTA (Lavender Top) "Vacutainer" tube should be used to collect venous blood.

2. Transport time and temperature: ≤ 2 hours at room temperature.

B. Negative Smear follow-up: Specimens should be collected for a minimum of two (2) successive days at 6-8 hour intervals. Collection 12 hours after the chill is optimal. Immediately deliver to the laboratory Client Services Unit.

VI. RESULTS:

A. The turn-around time for results of hematology tests will follow the guidelines indicated in the "Specimen/Testing Priority" section, page 8.

B. Blood smears and fluid cytospin preparations are filed in the hematology section in the main laboratory. Peripheral blood smears are retained for four weeks; body fluid cytospin preparations are retained for one year. Pathologist reviewed smears are retained for two years. They may be pulled for study but must be returned. Please ask a technologist for assistance.

Paper Copies are not Document Controlled

CYTOPATHOLOGY

TELEPHONE: Ext: 76687

LOCATION: Clinical Addition, Room 1B-328A

SUPERVISOR: Shayla Powell, MLS (ASCP)^{CM} Extension: 70659

DIRECTOR: Mariam Mir, M.D., Extension: 70578

STAFF PATHOLOGISTS:

Bradford Barker, M.D., Extension: 70712
Ellen Araj, M.D., Extension: 70697
Toby Gray, M.D., Extension: 70721
Shelby Melton, M.D., Extension 70726
Mariam Mir, M.D., Extension: 70578
Daniel R. Nussenzveig, M.D., PhD, Extension: 71269
Roshan Patel , M.D., Extension: 70325
Megan Wachsmann, M.D., Extension: 70724

Paper Copies are not Document Controlled

I. GENERAL INFORMATION:

A. Cytopathologic methods provide a rapid, inexpensive, simple means of diagnosis. Satisfactory cytological examinations may be conducted on properly collected sputum, bronchoscopy specimens, exudates, body cavity fluids, cerebrospinal fluid, urine, bladder washes, gastric washes, vaginal and cervical smears, and other smears for cytologic assessment.

B. Requests for fine needle aspirations (FNA) of palpable masses are to be made via the On-Call Pathology Resident pager, 214-759-3341, from 8:00 a.m. to 4:30 p.m. Monday thru Friday.

C. Containers of Cytology Fixative (a clear fluid labeled Cytolyt Fixative) for sputum may be obtained from SCMS located in the basement of Building 2J. This same fixative should be used for fixation of all other fluids (**except CSF which should be submitted fresh**) collected for cytological examination (see Section III, below). **Please remember that separate specimens should be sent to the Microbiology Laboratory if cultures are necessary and fixative must not be added to any material that is being sent for culture.**

D. Please submit two additional patient labels with each fluid. These labels should be placed in the sleeve of the Biohazard Bag.

E. Examination of samples for malignant cells requires fresh material. Cells begin to degenerate immediately after their removal from the body, which may preclude accurate diagnosis. Please send specimen to the Client Services Unit (70666) **as soon as possible** after collection.

IV. SPECIMEN IDENTIFICATION:

A. Every specimen container for cytologic examination should be labeled with the following:

1. Patient's complete name.
2. Patient's complete social security number.
3. Collector's initials and Date & time of collection.
4. Specimen source.

B. Every sample submitted for a cytologic examination must be accompanied by a Tissue Examination Request Form (SF-515) that has been appropriately completed. This includes patient's complete name, complete social security number, specimen source (with laterality), date

and time of collection, a brief clinical history, and the physician's legible name and pager number.

C. Specimens will **not** be accepted for evaluation unless the specimen container is properly identified, in the proper fixative, and is accompanied by a completed SF-515.

D. Samples received prior to 11:30 a.m. will be accessioned and processed the same day. Samples received after 11:30 a.m. will be refrigerated and accessioned/ processed the next working day.

III. PROCEDURES FOR COLLECTING MATERIAL FOR CYTOLOGY:

The fixative for all fluids (except CSF and sputums) is Cytolyt, which can be obtained from SCMS. Please submit two additional labels in the sleeve of the Biohazard Bag along with the labeled specimen.

A. SPUTUM:

Sputum is collected in a plastic cup. The preferable time of collection is **6:00 a.m. to 8:00 a.m. Deep cough** sputum (not saliva) is essential for adequate evaluation.

B. BRONCHIAL BRUSHINGS, WASHES, AND WANG NEEDLE ASPIRATES:

The respiratory material obtained by brushings or Wang needle aspiration is to be spread thinly and evenly on glass slides labeled in pencil with the patient's full name and complete Social Security number on the frosted end. Half of the slides should be immediately fixed by placing in a Coplin jar of 95% alcohol obtained at the CSU window after contacting the Cytology section. The remaining slides should be allowed to air dry (no fixative) and sent to the Cytology section along with the alcohol fixed slides. Washes are mixed with an equal volume of cytology fixative (CytoLyt) and submitted. See section C if respiratory specimens for both culture and stains for pathogens are requested.

C. RESPIRATORY SPECIMENS FOR BOTH MICROBIAL CULTURES AND SPECIAL STAIN FOR PNEUMOCYSTIS:

Separate containers of the specimen should be sent. One, unfixed, should be sent to Microbiology for cultures with the appropriate orders (See Microbiology Section). The other container, fixed with cytology fixative (clear fluid labeled Cytolyt fixative), should be sent with a tissue examination form (SF-515) requesting stains for Pneumocystis. These tests are performed in separate parts of the laboratory and submitting the specimen in this manner will avoid delay in processing the test requests.

D. PLEURAL, PERITONEAL, AND PERICARDIAL FLUIDS:

Large volumes of these fluids are acceptable and optimal. Large volume fluid specimens may be kept fresh and should be immediately submitted to Client Services, main laboratory. After hours they may be stored in the refrigerator in Client Services. If the fluid collected is less than 50 mL, it can be mixed with cytology fixative (clear fluid labeled Cytolyt fixative).

E. URINARY TRACT SPECIMENS:

For urine, a midstream to final stream specimen is recommended. Avoid first morning specimens. Add an equal volume of cytology fixative (clear fluid labeled Cytolyt fixative). Please indicate on the SF-515 form if the specimen was obtained by catheterization. For other specimens, such as bladder wash, specify collection method used and preserve with equal amounts of cytology fixative (clear fluid labeled Cytolyt fixative).

F. SPINAL FLUID:

Specimens should be submitted to the Client Services Unit immediately. Please label specimen

Paper Copies are not Document Controlled

and alert laboratory if Creutzfeldt-Jakob disease is suspected. At least 1 mL of fluid is needed. Specimens should be received fresh.

G. CERVICAL AND VAGINAL LIQUID-BASED CYTOLOGY SPECIMENS:

Gynecologic samples should be collected by the clinician using a cervical sampling device that is immersed and rinsed in a vial containing preservative/fixation solution (PreservCyt). The specimen vial must be properly labeled with the patient's full name and social security number. Please remember to recap the vial tightly. The line on the cap should pass the line on the vial to ensure proper sealing of the specimen.

H. TZANCK (CONVENTIONAL) SMEARS:

Smears should be spread thinly and evenly on a clean glass microscope slide, with the complete patient's name and complete Social Security number clearly written in pencil on the frosted end of the slide. Slides must be **immediately** fixed - either place the slides into a jar of 95% ethanol and cap tightly, or spray a thin film of fixative over the surface of the smear and place in a cardboard or plastic carrier. Fixative is available from the cytology lab upon request.

IV. FINE NEEDLE ASPIRATIONS:

Fine needle aspirations of palpable masses (which do not require radiological guidance) are performed by the Pathology Staff Monday through Friday between the hours of 8:00 a.m. and 4:00 p.m. If, after discussion, your patient agrees to have an FNA, please call the On-Call Pathology Resident (pager 214-759-3341) for consultation. A completed SF-515 Tissue Examination form should be placed on the chart. Pathology staff will obtain the patient's signed informed consent (iMedConsent) immediately before the time-out and prior to performing the procedure.

Pathology staff also prepares and evaluates the smears of the fine needle aspirations done with radiological guidance. Radiology will call the On-Call Pathology Resident (pager 214- 759-3341) **before** the aspiration is performed to ensure that a pathologist/cytotechnologist is available. Pulmonary, Endocrinology, and GI services should schedule fine needle aspirations with Pathology at least one day in advance to not conflict with Radiology's scheduled procedures. An appropriately completed SF-515 Tissue Examination form is required.

Paper Copies are not Document Controlled

CLIENT SERVICES UNIT AND IMMUNOPATHOLOGY - FLOW CYTOMETRY (IMMUNOPHENOTYPING)

TELEPHONE: Extension: 70268/74834

LOCATION: Clinical Addition, 1B-410A

SUPERVISOR: Jennifer Wais, MLS (ASCP), Extension: 70278

DIRECTOR: Daniel Nussenzveig, MD, PhD, Extension: 71269

I. GENERAL INFORMATION:

The Flow Cytometry Section, part of the Client Services and Immunopathology Unit, is located in the Clinical Addition, Room 1B-424. The section is staffed from 8:00 a.m. to 4:30 p.m. Monday through Friday, except for official government holidays. Flow Cytometry performs CD4/CD8, and Leukemia and Lymphoma workups.

Flow cytometric immunophenotyping is a procedure by which intact, viable leukocytes from peripheral blood, body fluids, biopsies, or aspirates are stained for membrane surface antigens by direct immunofluorescence techniques.

The quantitative determination of these antigens on each leukocyte is then performed using the flow cytometer. The antibodies used for this procedure have been carefully standardized by the International Cluster Designation (CD) Workshop so that the antibody specificity is known and the leukocyte staining characteristics for each antibody can be related to the cell's lineage, function, and/or degree of differentiation. Using this information to determine the relative abundance of the various leukocyte populations, it is possible to evaluate a patient's immune status (helper and suppressor T-cell subsets in HIV disease), or the occurrence of cells with abnormal phenotypes (often characteristic in leukemias and lymphomas).

II. SPECIMENS:

A. CD4/CD8 Ratio (Helper/Suppressor Ratio)*:

Two tubes of peripheral blood must be drawn - a Lavender Top (EDTA) for CBC, and a small Lavender Top (4 mL, EDTA) for flow cytometry. Samples are to be kept at room temperature - **do not refrigerate**.

B. Leukemia work-up:

One yellow top (ACD) anti-coagulated tube of peripheral blood is required. Bone marrow may be submitted as well, but must be drawn into a heparinized syringe. Transfer into an ACD tube is acceptable. A minimum of 3 cc must be obtained. The battery of markers to be used will be determined by the type of leukemia suspected (ALL, CLL, etc). A brief history, written on a Misc. form (SF-152), must be submitted with the sample. Transport at once to the laboratory.

The Flow Cytometry Laboratory must be contacted prior to obtaining these samples to ensure the specimen will be handled appropriately. Telephone the Flow Cytometry staff (Ext: 70268); the clinical pathologist on-call (Ext. 70669); or the pathology resident on the surgical pathology rotation (Ext: 70679).

C. Lymphoma work-up:

Analyses can be done on both fluid and tissue samples. Extent of fluid sample analysis will be determined by the cellularity of the sample. Submit the fluid in a sterile tube or Yellow Top (ACD) tube immediately. Tissue samples can include fine needle aspirate material and lymph node biopsies. Biopsy samples must be submitted immediately to the laboratory on sterile gauze dampened with sterile saline, or in a tube of RPMI transport medium (available from the lab).

Paper Copies are not Document Controlled

When possible, lymph node biopsy specimens should be bisected with half submitted for flow cytometric evaluation and half submitted for histology. This allows morphological verification of the cells analyzed (minimum 0.5 cm^3).

The Flow Cytometry laboratory must be contacted prior to obtaining these samples to ensure the specimen will be handled appropriately. Contact the Flow Cytology staff (Ext: 70268), the clinical pathologist on call (Ext. 70669), or the pathology resident on the surgical pathology rotation (Ext: 70679 or pager 214-759-3341).

D. Unacceptable samples for Flow Cytometry:

1. Samples greater than 4 days old at time of processing.
2. Clotted/partially clotted tubes (poor mixing).
3. Inadequate draw (less than 3 mL in ACD yellow top tube or less than 1 mL in EDTA lavender top tube).
4. Hemolyzed samples.
5. Refrigerated or frozen specimens.

III. TEST RESULTS:

A. CD4/CD8 Ratio - data reported includes percentage and absolute numbers of CD4+ (helper) and CD8+ (suppressor) T-lymphocyte subsets, and the helper/suppressor ratio.

B. Leukemias and lymphomas - extensive batteries are run, including markers for T-lymphocytes (CD2, 3, 4, 5, 7, 8); B-lymphocytes (CD10, 19, 20, 22, 23, kappa and lambda light chains, FMC-7); monocytes (CD11c, 13, 14, 15, 33); granulocytes (CD11b, 13, 14, 15, 16); natural killer cells (CD56); activation (CD38 and HLA-DR) and stem cells (CD34). Markers pertinent to the individual case will be reported (as a percentage) following review by a pathologist, and an interpretation rendered.

Paper Copies are not Document Controlled

CLIENT SERVICES UNIT AND IMMUNOPATHOLOGY – IMMUNOLOGY SECTION

TELEPHONE: Extension: 70260

LOCATION: Clinical Addition, 1B-406

SUPERVISOR: Jennifer Wais, MLS(ASCP), Extension: 70278

DIRECTOR: Megan Wachsmann, MD, Extension: 70724

I. **GENERAL INFORMATION:**

A. The Immunology Section, part of the Client Services and Immunopathology Unit, is located in the Clinical Addition, Room 1B-406.

Testing for Hepatitis A, B, and C antibody, and HIV Ag/AB screen, Chlamydia trachomatis/Neisseria gonorrhoeae (CT/NG) PCR, Procalcitonin, anti CCP, Tacrolimus, SARS-CoV-2 IgG, Cryptococcal Antigen in CSF, and Influenza PCR are performed Monday through Friday including weekends and holidays.

The following testing is performed Monday through Friday, excluding official government holidays:

- ANA Testing (ANA, ENA-6, dsDNA, anti-SM, anti-RNP, Jo-1, Scl-70, SS-A, SS-B)
- ANCA Screen
- Cryptococcal Antigen -serum
- CSF VDRL
- Fungitell Screen
- Helicobactor pylori IgG
- Herpes Simplex Virus 1 & 2 IgG
- Measles IgG
- Mitochondrial Antibody
- Mumps IgG
- Rubella IgG
- QuantiFERON- TB Gold Plus
- Smooth Muscle Antibody
- Syphilis Testing, Serum [*Treponema pallidum* AB Trep Sure), RPR, MHA-TP]
- Vaginitis Affirm
- Varicella Zoster Virus (IgG)

B. ANA Panel detects the presence of human nuclear antibodies. Positive specimens are reported with pattern and titer and are reflexed to dsDNA and ENA-6 panel. Positive ENA specimens are reflexed to anti-SM, anti-RNP, Jo-1, Scl-70, SS-A, and SS-B antibody.

C. Hepatitis C Virus Antibody screen by chemiluminescence is performed on a serum RT specimen. This is a screening test only, and not diagnostic of active HCV infection. An EDTA Lavender Top tube must accompany the original specimen for confirmatory testing. Reactive specimens are reflexed to HCV viral load by RT-PCR.

D. HIV Antigen/Antibody screen by chemiluminescence is performed on a serum RT specimen. Reactive results are confirmed by HIV 1/2 STAT.

E. Syphilis testing on serum is performed by reverse algorithm. The *Treponema pallidum* Antibody test is performed by ELISA. Reactive specimens are reflexed to RPR (Reagin) test and are reported with titer. Non-reactive RPR tests are reflexed to MHA-TP test.

Refer to the Index of Tests (yellow section) for additional specific test information including testing schedules.

Paper Copies are not Document Controlled

II. UNIQUE SPECIMEN COLLECTION:

VAGINITIS AFFIRM

Sample collection is a critical step. Personnel collecting vaginal fluid specimens should be well-trained on adequate sample collection technique. For specimen collection, use only the Affirm VPIII Ambient Temperature Transport System (ATTS). **Separate swabs should be used for other tests, e.g. culture or microscopic slide samples.**

a. Open the seal on outer plastic pouch of Affirm VPIII Ambient Temperature Transport System (ATTS) and remove all components [each plastic pouch contains enough material for the collection and transport of one vaginal specimen].

b. Tear open the foil pouch and remove the ATTS Reagent Dropper. Invert the ATTS Reagent Dropper over the Sample Collection Tube holding the dropper at the base of the cap.

c. Center the teeth of the ATTS Reagent Dropper Dispensing Tool at the center of the inverted ATTS Reagent Dropper. Lightly squeeze the ATTS Reagent Dropper Dispensing Tool to break the ampule in the ATTS Reagent Dropper.

d. Release pressure on the ATTS Reagent Dropper Dispensing Tool while continuing to hold the dropper at the base of the cap. Firmly squeeze the ATTS Reagent Dropper Dispensing Tool, ONE TIME ONLY, to dispense reagent from the ATTS Reagent Dropper into Sample Collection Tube.
NOTE: Patient specimen must be collected immediately after the ATTS Reagent has been dispensed into the Sample Collection Tube. DO NOT pre-dispense the ATTS Reagent into the Specimen Transport Tube.

e. Peel wrapper to expose patient swab. Remove swab. Discard wrapper. Collect patient specimen/take sample.
- Place the patient in position for a pelvic examination. Insert speculum into the vagina to permit visualization of the posterior vaginal fornix.
- Using the sterile swab, obtain a sample from the posterior vaginal fornix. Twist or roll the swab against the vaginal wall two or three times, ensuring the entire circumference of the swab has touched the vaginal wall. Swab the lateral vaginal wall while removing the swab.

f. Immediately place the swab into the Sample Collection Tube containing the ATTS Reagent. Break swab shaft at pre-scored line just above the top of the tube. Discard remaining shaft into an infectious waste container.

g. Place the Sample Collection Cap over the exposed end of the swab and firmly press the cap onto the Sample Collection Tube. The cap will "snap" onto the tube when it is properly seated.

h. Label the Sample Collection Tube with the patient identification information. Include the time and date the sample was collected and the initials of the collector.

III. TEST RESULTS:

INTERPRETATION AND FOLLOW-UP FOR REVERSE ALGORITHM SYPHILIS SCREEN RESULTS

Clinical History	Test and Result			Interpretation	Follow-up
	TREP SURE	RPR	MHA-TP		
Unknown history of syphilis	Nonreactive	N/A	N/A	No serologic evidence of syphilis	None, unless clinically indicated (e.g., early syphilis)
Unknown history of syphilis	Reactive	Reactive	N/A	Untreated or recently treated syphilis	See CDC treatment guidelines
Unknown	Reactive	Nonreactive	Nonreactive	Probable false-	Retest in 2-4

Paper Copies are not Document Controlled

history of syphilis				positive IgG assay or possible previous infection	weeks if clinically indicated, or follow clinically if suspicion of infection is low
Unknown history of syphilis	Reactive	Nonreactive	Reactive	Possible syphilis (e.g., early or latent) or previously treated syphilis. Possible cross-reactivity.	Historical and clinical evaluation required
Known history of syphilis	Reactive	Nonreactive	Reactive or N/A	Past, successfully treated syphilis	None
TREP SURE enzyme immunoassay; RPR, Rapid Plasmin Reagin (with titer); MHA-TP, Microhemagglutination Assay for *Treponema pallidum* Antibodies. http://www.cdc.gov/std/tg2015/syphilis.htm					

Paper Copies are not Document Controlled

LISTING OF SEROLOGIC TESTS SENT TO REFERENCE LABS

TEST	SPECIMEN	TURN-AROUND	COMMENTS
I. BACTERIAL SEROLOGY			
A. Meningitis antigens panel includes: *H. influenzae,* *S. pneumoniae* *N. meningitidis* Group B Streptococcus	CSF	1 Day	**Requires Pathologist approval.** **A bacterial culture with gram stain MUST also be ordered.**
B. Ehrlichiosis	Small Red Top	1 Week	
C. *Legionella pneumophila* (serogroups 1-6)	Small Red Top	2 Weeks	Polyvalent antiserum only
D. Lyme disease (*Borrelia burgdorferi)*	Small Red Top	1 Week	
E. *Bartonella henselae*	Small Red Top	1 Week	"Cat-Scratch" disease; Bacillary Angiomatosis
F. Weil-Felix (Rickettsial Disease) includes: Proteus OX-2, OX- 19, and OX-K	Large Red Top	2 Weeks	Useful in presumptive screening for Rickettsial disease. Lacks sensitivity and specificity to be sole serologic test; evaluation should include species-specific EIA or IFA techniques.
G. Brucella agglutination	Large Red Top	2 Weeks	
H. Tularemia agglutination	Large Red Top	2 Weeks	
II. FUNGAL SEROLOGY Histoplasma, yeast phase Histoplasma, mycelial phase Blastomyces Coccidioides *Aspergillus fumigatus*	Large Red Top	2 Weeks	All fungi are run as a battery when "Fungal Serology" is requested.
Histoplasma Antigen, Quantitative			Requires Infectious Disease approval.
III. VIRAL SEROLOGY			
Coxsackie A	Large Red Top, CSF	1 Week	1. "Viral Studies" or "Viral Serology" will NOT be accepted. 2. Refer to "Lab Test Information" option on "Tools" bar using CPRS. 3. CSF samples must be accompanies by a serum sample.
Coxsackie B, 1-6	Large Red Top, CSF	1 Week	
Cytomegalovirus (CMV)	Large Red Top, CSF	1 Week	
Epstein-Barr (EBV)	Large Red Top, CSF	1 Week	
Hepatitis Be, Ab & Ag	Large Red Top	1 Week	
Hepatitis D, Ab Total	Large Red Top	1 Week	
Herpes Simplex	Large Red Top	1 Week	
Parvovirus B19	Large Red Top	1 Week	
Poliomyelitis	Large Red Top	1 Week	
Respiratory syncytial virus (RSV)	Large Red Top	1 Week	

Paper Copies are not Document Controlled

CLIENT SERVICE AND IMMUNOPATHOLOGY UNIT-MOLECULAR DIAGNOSTICS SECTION

TELEPHONE: Extensions: 70287

LOCATION: Clinical Addition, 1B-424

SUPERVISOR: Jennifer Wais, MLS (ASCP), Extension: 70278

DIRECTOR: Megan Wachsmann, MD, Extension: 70724

I. GENERAL INFORMATION:

A. The Molecular Diagnostics Section, part of the Client Services and Immunopathology Unit, is located in the Clinical Addition, Room 1B-424. The Molecular Diagnostics Section is staffed from 8:00 a.m. to 4:30 p.m. Sunday through Friday, except for official government holidays..

B. HBV DNA quantitative viral load is intended for use as an aid in the management of patients with chronic HBV infection undergoing anti-viral therapy. The results must be interpreted within the context of all relevant clinical and laboratory findings. It is NOT intended for use as a screening test for the presence of HBV in blood or blood products or as a diagnostic test to confirm the presence of HBV infection. Methodology: In vitro nucleic acid amplification using the cobas 6800, Real-time PCR. Quantitative Range: 10-1,000,000,000 IU/mL (1-9 log IU/mL).

C. HCV RNA quantitative viral load is intended for use as an aid in the diagnosis of HCV infection in the following populations: individuals with antibody evidence of HCV and evidence of liver disease, individuals suspected to be actively infected with HCV antibody evidence, and individuals at risk for HCV infection with antibodies to HCV; and as an aid in the management of HCV-infected patients undergoing anti-viral therapy. The results must be interpreted within the context of all relevant clinical and laboratory findings. It has NOT been approved for use as a screening test for the presence of HCV in blood or blood products. Methodology: In vitro nucleic acid amplification using the Cobas 6800, Real-time PCR. Quantitative Range: 15-100,000,000 IU/mL (1.18-8 log IU/mL).

D. HIV-1 RNA quantitative viral load is intended for use in conjunction with clinical presentation and other laboratory markers for the clinical management of HIV-1 infected patients. The test can be used to assess patient prognosis by measuring the baseline HIV-1 level or to monitor the effects of antiretroviral therapy by measuring changes in HIV-1 RNA levels during the course of antiretroviral treatment. It is NOT intended for use as a screening test for the presence of HIV-1 in donated blood or plasma or as a diagnostic test to confirm the presence of HIV-1 infection.

E. The Xpert BCR-ABL Ultra Assay for Chronic Myeloid Leukemia (CML) monitoring is an *in vitro* diagnostic test for the quantitative detection of the BCR-ABL1 chromosomal translocation mRNA transcripts (types e13a2/b2a2 or e14a2/b3a2) and the ABL1 endogenous control mRNA transcript in peripheral blood specimens from patients previously diagnosed with chronic myelogenous leukemia (CML). The Xpert BCR-ABL Ultra detects the chromosomal translocation mRNA transcripts for the p210 form resulting from two major breakpoints translocation e13a2 (b2a2) and e14a2 (b3a2). The Xpert BCR-ABL Ultra will not report the specific type of BCR-ABL1 mRNA transcript present.

F. Roche Cobas® SARS-CoV-2 for use on the Roche Cobas® 6800 System is a real-time RT-PCR test intended for the qualitative detection of nucleic acids from SARS-CoV-2 in nasopharyngeal (NP) swab specimen from patients suspected of COVID-19 by their healthcare provider.

G. CT/GC PCR Panel test is a qualitative in vitro diagnostic test designed for automated detection and differentiation of genomic DNA from Chlamydia trachomatis (CT) and/or Neisseria gonorrhoeae (NG) to aid in the diagnosis of chlamydial and gonorrheal urogenital

Paper Copies are not Document Controlled

disease. The assay may be used to test specimens from asymptomatic and symptomatic individuals.

H. The **cobas**® HPV Test is a qualitative *in vitro* test for the detection of human papillomavirus in cervical specimens. The test specifically identifies types HPV16 and HPV18 while concurrently detecting the other high-risk (HR) types (31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66 and 68).

II. UNIQUE SPECIMEN COLLECTION
CT/NG PCR Panel

Paper Copies are not Document Controlled

cobas® PCR Urine Sample Kit

For *Chlamydia trachomatis* and *Neisseria gonorrhoeae*

Short guide[1] for urine sample collection

URINE SAMPLE

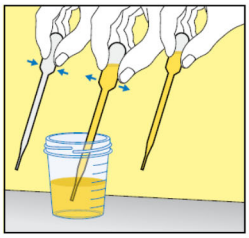
FOR THE PATIENT

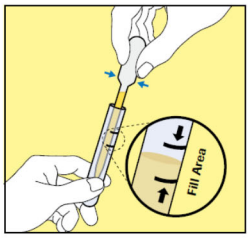
1. COLLECT:
Prior to sampling, the patient should not have urinated for **at least one hour** and **female patient must not clean** the labial area.

Ask the patient to provide the **first catch urine** (10-50mL) into a urine collection cup.

FOR HEALTHCARE PROFESSIONALS

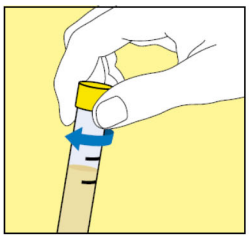
2. PIPET:
Use the provided disposable pipet **to transfer** (within 24 hours) the **urine** into the **cobas®** PCR Media tube. **The correct volume of urine has been added when the fluid level is between the two black lines on the tube label.**





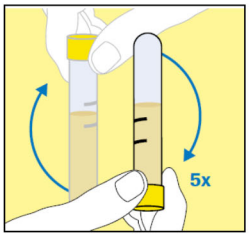
3. CLOSE:
Tightly re-cap the tube.

HANDLING PRECAUTIONS:
Use care to avoid splashing of contents.



4. MIX:
Invert the tube 5 times.

The specimen is now ready for transport.



Transport: 2˚C to 30˚C ▪ **Stability of sample:** 12 months

THE SPECIMEN WILL BE REJECTED IF THERE IS:
- Inadequate volume (insufficient or excess)
-Excess of blood (>0.35%)
-Replens® vaginal moisturizer

Roche

cobas®

[1] Individuals collecting or directing the collection of samples should consult the complete instructions for use.

COBAS is a trademark of Roche. © Roche 2017.

01-Aug-2

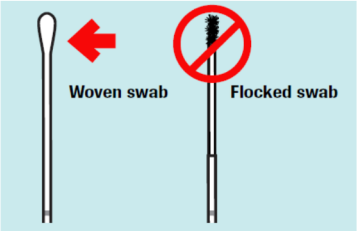
Clinician Instructions

Oropharyngeal (Throat) Swab Specimen Collection Guide

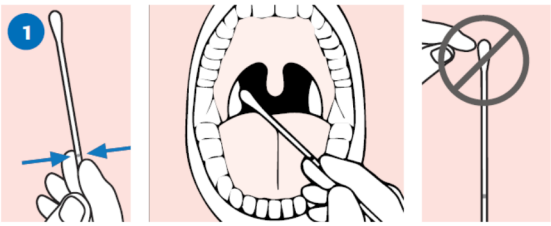
Clinician-collection with the cobas® PCR Media Uni or Dual Swab Sample Kit

PROCEDURAL NOTES:

- If using the **cobas®** PCR Media Dual Swab Sample Kit, discard the flocked swab, as it is not needed for this procedure. **Use only the woven swab.**
- Minimize use of over-the-counter hygiene and/or prescription products in the throat during or prior to sample collection to avoid potential for test interference.
- Avoid contact of the **cobas®** PCR Media with the skin, eyes or mucous membranes. If contact does occur, immediately wash with large amounts of water.

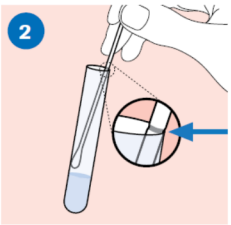


NOTE: ***Do not*** pre-wet the swab in **cobas®** PCR Media before collection.



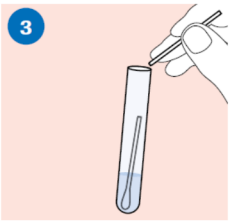
COLLECT:

- **To collect the specimen, hold the woven swab with the scoreline above your hand.**
- **Insert the swab into the mouth and collect the specimen from the bilateral posterior pharynx, both tonsils and the uvula.**
- **Withdraw the swab carefully.**
- **Do not let the swab touch any surface before placing it into the collection tube.**



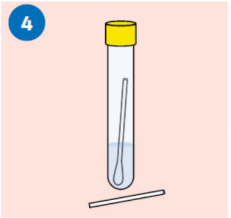
ALIGN:

- **Remove the cap from the cobas® PCR Media Tube.**
- **Lower the swab specimen into the tube until the visible scoreline on the swab is aligned with the tube rim.**
- **The tip of the swab should not be submerged into the liquid prior to breaking the shaft.**



BREAK:

- **Carefully leverage the swab against the tube rim to break the swab shaft at the scoreline.**



CLOSE:

- **Tightly re-cap the cobas® PCR Media Tube. The specimen is now ready for transport.**
- **Discard the top portion of the swab.**

SPECIMEN TRANSPORT AND STORAGE:

- Transport and store the **cobas®** PCR Media Tube containing the collection swab at 2°C to 30°C.
- The specimen should only contain 1 woven swab and may be rejected if the tube contains no swab or 2 swabs.

COBAS is a trademark of Roche. ©2020 Roche. MC-US-08387-0221

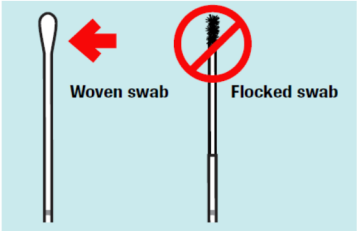
Clinician Instructions

Anorectal (Rectal) Swab Specimen Collection Guide

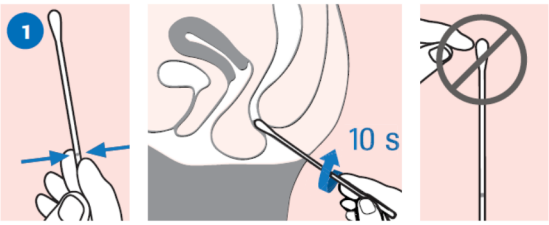
Clinician-collection with the cobas® PCR Media Uni or Dual Swab Sample Kit

PROCEDURAL NOTES:

- If using the **cobas®** PCR Media Dual Swab Sample Kit, discard the flocked swab, as it is not needed for this procedure. **Use only the woven swab.**
- Minimize use of over-the-counter hygiene and/or prescription products in the rectum during or prior to sample collection to avoid potential for test interference.
- If the swab is grossly contaminated with feces, discard and repeat the collection.
- Avoid contact of the **cobas®** PCR Media with the skin, eyes or mucous membranes. If contact does occur, immediately wash with large amounts of water.

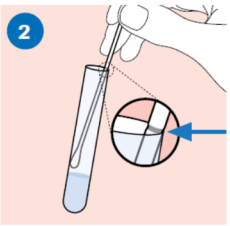


NOTE: ***Do not*** pre-wet the swab in **cobas®** PCR Media before collection.



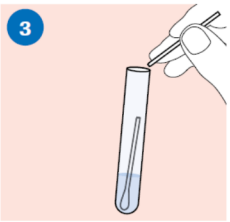
COLLECT:

- To collect the specimen, hold the woven swab with the scoreline above your hand.
- Insert the swab about 3 to 5 cm (1-2 inches) into the anal canal. Gently turn the swab in a clockwise direction for about 5 - 10 seconds while rubbing the swab against the walls of the rectum.
- Withdraw the swab carefully.
- If the swab is grossly contaminated with feces, discard and repeat the collection.
- Do not let the swab touch any surface before placing it into the collection tube.



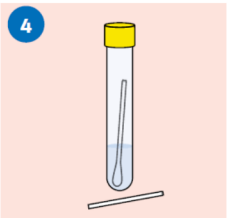
ALIGN:

- Remove the cap from the cobas® PCR Media Tube.
- Lower the swab specimen into the tube until the visible scoreline on the swab is aligned with the tube rim.
- The tip of the swab should not be submerged into the liquid prior to breaking the shaft.



BREAK:

- Carefully leverage the swab against the tube rim to break the swab shaft at the scoreline.



CLOSE:

- Tightly re-cap the cobas® PCR Media Tube. The specimen is now ready for transport.
- Discard the top portion of the swab.

SPECIMEN TRANSPORT AND STORAGE:

- Transport and store the **cobas®** PCR Media Tube containing the collection swab at 2°C to 30°C.
- The specimen should only contain 1 woven swab and may be rejected if the tube contains no swab or 2 swabs.

COBAS is a trademark of Roche. ©2020 Roche. MC-US-08388-0221

Clinician Instructions

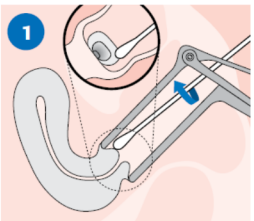
Endocervical Swab Specimen Collection Guide

Clinician-collection with the cobas® PCR Media Dual Swab Sample Kit

PROCEDURAL NOTES:

- Vaginal lubricants, speculum jellies, creams, and gels containing carbomer(s) may interfere with the test and should not be used during or prior to sample collection.
- If the collected specimen contains excess blood (specimen has a red or brown color), it should be discarded and not used for testing.
- Avoid contact of the **cobas®** PCR Media with the skin, eyes or mucous membranes. If contact does occur, immediately wash with large amounts of water.

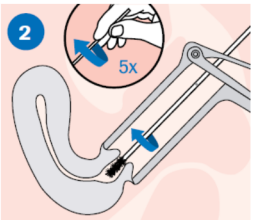
NOTE: ***Do not*** pre-wet the swab in **cobas®** PCR Media before collection.



CLEAN:

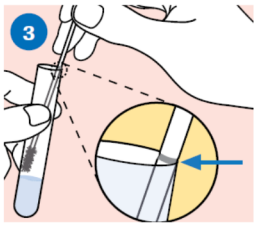
- **Using the woven swab, remove excess mucus from the cervical os and surrounding mucosa.**
- **Discard the swab after cleaning.**

NOTE: Cleaning excess mucus from the cervical os is required to ensure an adequate sample is obtained for processing.



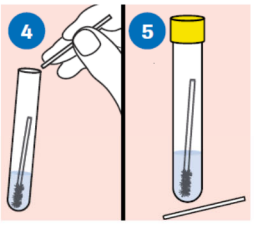
COLLECT:

- **To collect the specimen, hold flocked swab with the scoreline above your hand and insert into the endocervical canal.**
- **Gently rotate the swab 5 times in one direction in the endocervical canal. Do not over-rotate.**
- **Carefully withdraw the swab, avoiding any contact with the vaginal mucosa.**



ALIGN:

- **Remove the cap from the cobas® PCR Media Tube.**
- **Lower the swab specimen into the tube until the visible scoreline on the swab shaft is aligned with the tube rim.**
- **The bud of the swab should not be submerged into the liquid prior to breaking the shaft.**



BREAK:

- **Carefully leverage the swab against the tube rim to break the swab shaft at the scoreline.**

CLOSE:

- **Tightly close the cobas® PCR Media Tube. The specimen is now ready for transport.**
- **Discard the top portion of the swab.**

SPECIMEN TRANSPORT AND STORAGE:

- Transport and store the **cobas®** PCR Media Tube containing the collection swab at 2°C to 30°C.
- The specimen should only contain 1 flocked swab and may be rejected if the tube contains no swab or 2 swabs.

COBAS is a trademark of Roche. ©2021 Roche. MC-CA-01787

MICROBIOLOGY SECTION

TELEPHONE:	Specimen Processing,	Extension: 76623
	Routine Bacteriology,	Extensions: 76627/70672
	Blood Cultures,	Extension: 76626
	Mycology,	Extension: 76620
	Mycobacteriology (AFB),	Extension: 70676
	Limited Parasitology,	Extension: 76622
LOCATION:	Clinical Addition, Room 1B-400	
SUPERVISOR:	Bonnie Greene,MHA, MT(ASCP),	Extension: 70673, Pager:
DIRECTOR:	Toby Gray, M.D.,	Extension: 70721, Pager: 214-759-4073

I. GENERAL INFORMATION:

A. BACTERIOLOGY: Room 1B-400; Extension: 70672

1. Processes specimens for routine bacterial gram stain, aerobic culture and susceptibility (C&S).

2. Processes specimens for anaerobic culture.

3. All test requests must be ordered through the computer using CPRS or with a requisition during periods of downtime. The specimen label **must include the patient's name, full social security number or patient identification number, a description of the specimen source, the order number, date, time and collector's initials.**

4. Duty hours are 8:00 a.m. to 4:30 p.m. daily.

B. SPECIAL MICROBIOLOGY: Includes Mycobacteriology, Room 1B-400D, Ext. 70676
Mycology, 1B-400C, Ext. 76620
Limited Parasitology, 1B-400B, Ext. 76622

1. Processes all specimens related to AFB (mycobacteriology), and fungal cultures and smears.

2. All test requests must be ordered through the computer using CPRS or with a requisition during periods of downtime. The specimen label **must include the patient's name, full social security number or patient identification number, a description of the specimen source, the order number, date, time and collector's initials.**

3. Duty hours are 8:00 a.m. to 4:30 p.m. with limited services on weekends and holidays.

C. PATIENT IDENTIFICATION:

1. Each patient must have an armband or hospital identification card.

2. The patient's identification must be verified before specimen collection by checking the patient's armband and/or identification card. The name and social security number or identification number must match the name and number of the test order and specimen label.

3. Use at least two patient identifiers: full name, Social Security number, and/or date of birth.

D. LAB TEST ORDER:

All microbiological tests should be ordered through the hospital computer using CPRS. Use the computer downtime requisitions when the computer is down. Do not combine microbiological tests requests on a patient sample with test requests for other laboratory sections (e.g., Chemistry, Hematology, etc.). Use a separate order for each request.

Paper Copies are not Document Controlled

1. All test requests (i.e., computer-generated orders or paper requisitions) must contain the patient's name and full identification number, ward or clinic location, specimen type and source, date and time of specimen collection, any relevant clinical information (i.e., type of infection and/or organism expected), the requestor's name, and any special requests.

2. A separate request must be ordered for each test, e.g., routine bacterial C&S, anaerobic culture, fungus, AFB, parasitology.

3. Special requests must be coordinated with laboratory personnel prior to submission. Only isolates from blood cultures and multi-drug resistant organisms are routinely saved.

4. Generally, only one (1) specimen collection per 24-hour period will be processed. Submit up to three (3) same specimen types per week for processing. Blood cultures and sputum x 3 for rule out TB are excluded from these criteria (see Blood Culture Collection procedure).

5. Include in the order comment the specimen source and, when appropriate, type of infection and/or organism expected.

NOTE: UNCLEAR ORDERS. Test orders that may be unclear (non-standard, non-specific terminology, etc.), must be clarified prior to continuation of testing by contacting the provider or other health care professional who placed the order. Specimens will be processed to maintain sample integrity if there is a delay in clarification of test orders.

VERBAL ORDERS. Verbal orders will be documented on the worksheet and in the computer.

E. SPECIMEN LABELS:

1. The specimen order label must contain the patient's full name, full social security number or patient identification number, specimen source, date, time of collection and collector's initials and order number. **All** order numbers must be included on the specimen container.

2. All information must be legible.

3 All submitted specimens must have patient labels affixed to the specimen container. The laboratory will not process unlabeled specimens.

F. REPORTS AND TURN-AROUND TIMES:

1. Reports are entered in the Medical Center's computer as soon as cultures/tests are completed. Results are finalized as follows:

   a. Gram-stained smears are routinely prepared on essentially all samples except urine, stool, and upper respiratory tract (throat) and reports are available within 24 hours of specimen receipt.

   b. Routine C&S for all specimen types

      1) Preliminary report at 24 hours

      2) Final report at 48-72 hours

   c. Blood cultures.

      1) Preliminary report at 24 hours

      2) Interim report (if growth after preliminary report)

      3) Final report at 5 days

Paper Copies are not Document Controlled

d. Anaerobic cultures.

1) Preliminary report at 48 hours

2) Final report at 7 days

e. AFB smears. Daily

Reported within 24 hours of specimen receipt by the laboratory.

e. AFB cultures.

1) Preliminary report at 3 weeks if no growth.

2) Interim report if culture becomes positive.

3) Final report at 6 weeks.

4) AFB susceptibility test (SEND-OUT TEST) 3-4 weeks (after sufficient growth on solid culture medium).

f. Fungal cultures.

1) Fungal smears at 24 hours, Monday – Friday

2) Preliminary report at 2 weeks

3) Interim report, if culture becomes positive after 2 weeks

4) Final report at 4 weeks

g. MRSA Directive(nasal) Screen.

1) MRSA (nasal) Screen Culture (Discharge) - Final report at 24 hours

2) MRSA PCR (nasal) Admission – Reported within 2 hours of specimen receipt in laboratory

3) MRSA (nasal) Transfer and Discharge Culture - Final report at 24 hrs. after specimen is processed.

h. Respiratory Panel PCR (BioFire)-Daily

i. SARS-CoV-2 PCR (Cepheid)-Daily

j. Parasitology.

1) SEND-OUT/Referral Test

2) Clostridioides difficile toxin B (PCR) – daily

3) Vaginal Wet Prep/Gram Stain – Final report in 24 hrs.

4) Pinworm Exam – Final report in 24 hrs.

5) Scabies (Itch Mite) Exam – Final report in 24 hrs.

6) Arthropods (ticks, bed bugs, etc.) – 1 to 2 days

Paper Copies are not Document Controlled

7) Fecal Leukocytes (Lactoferrin test) – 1 day

2. To obtain microbiology results from the computer, refer to "Accessing Laboratory Data in CPRS" in this manual.

G. **SMEARS:**

1. Gram-stained smears are routinely prepared on essentially all samples except urine, stool, and upper respiratory tract (throat). Smear reports are available in the computer within 24 hours of specimen receipt. Stat "Gram Stain" must be specifically requested. STAT gram stains requests are limited to sterile fluids and surgical site specimens (CSF and surgical site specimens after normal duty hours).

2. AFB Stain results are available within 24 hours after receipt of specimens. Positive AFB stain results are reported immediately to the ordering/ attending physician/ward (critical result).

H. **CULTURE:**

1. Pathogens will be reported and quantified from 1+ (few) to 4+ (numerous).

2. Potential pathogens will be identified, and susceptibilities performed appropriate to the organism and site of infection.

I. **CRITICAL RESULTS:**

When results that meet the "critical" result criteria are encountered, the technologist will immediately notify the physician who requested the test, the patient's current provider, or the appropriate clinical staff. When results that meet the "alert" criteria are encountered, the technologist will notify the physician who requested the tests, the patient's current provider, or the appropriate clinical staff, within 4 hours.

III. SPECIMENS:

FOR ALL PROCEDURES ON SPECIMEN COLLECTION OF MICROBIOLOGY SPECIMENS, REFER TO:
https://epm601.elsevierperformancemanager.com/Personalization/Home?virtualName=vanorthtexas-txdallas

The same specimen can be used for all microbiology orders; however, to prevent delay in processing, separate specimens for routine cultures and AFB or fungi should be submitted, (e.g., urine and sputum specimens). **Include all order numbers on the specimen label**.

A. General considerations:

1. **Safety considerations:**

a. Follow the established **STANDARD (UNIVERSAL) PRECAUTIONS** guidelines. Treating all specimens as potentially hazardous eliminates the need for warning labels.

b. Do not contaminate the external surface of the collection container or transport bag. Use leak-proof containers that seal tightly. Avoid spills.

c. Minimize direct handling of specimens in transit from the patient to the laboratory. Use sealable biohazard bags to transport the laboratory.

Note: Specimens obtained by a physician using needle aspiration should be transferred to a sterile tube prior to transport of the specimen to the laboratory. If there is little

Paper Copies are not Document Controlled

material in the syringe, the physician should draw a small amount of sterile non-bacteriostatic 0.85% NaCl or sterile broth through the syringe and then transfer the specimen to a sterile tube. Alternatively, and only if the specimen will be compromised by transferring it from the syringe, a small amount of sterile 0.85% NaCl or broth may be drawn into the syringe prior to removal of the needle. The physician should use a protective device while removing the needle to avoid injury and should **cap the syringe with a sterile cap prior to transporting it to the laboratory**.

2. **General guidelines for proper specimen collection:**

   a. Collect sample before administering antimicrobial agents if possible.

   b. Collect specimen with as little contamination from indigenous microbiota as possible to ensure that the sample will be representative of the infected site. Specimens from many body sites may contain an etiologic agent that would be considered part of the normal flora in a healthy host. This 'normal flora' (i.e., from skin, membranes, and the respiratory tract) could interfere with the interpretation of culture results and could overgrow and obscure the true agent of disease.

   c. Select the correct **anatomic site** from which to obtain the specimen by the proper technique and with the proper supplies.

   d. Optimize the capture of **anaerobes** from specimens by using the proper precaution, procedures, and supplies; biopsy or needle aspirates are the specimens of choice, while anaerobic swabs are least desirable. Never refrigerate specimens intended for anaerobic culture but, rather, maintain them at room temperature and deliver to the laboratory immediately.

   e. Utilize appropriate collection devices. Use sterile equipment and aseptic technique to collect specimens to prevent introduction of microorganisms during invasive procedures.

   f. Collect specimens in sturdy, sterile, screw-cap, leak-proof containers with lids that do not create an aerosol when opened.

   g. Clearly label the specimen container with the patient's name and identification number, source, specific site, order number, collector's initials, and the date and time of collection.

   h. Collect an adequate amount of specimen. Inadequate amounts of specimen may yield false-negative results. **In general, only one (1) specimen collection per 24-hour period will be processed. For blood cultures,** see Blood Culture Collection procedure.

   i. Develop an understanding of the microbiology laboratory's source identification schemes. Know when to include "rule-out" requests. For example, the laboratory may routinely screen for ***Shigella, Salmonella, Aeromonas, Plesiomonas***, and ***Campylobacter*** species in stool cultures but not for ***Yersinia*** or ***Vibrio*** species.

   j. Consider geographic location and season when ordering "rule-out" requests.

   k. Identify the specimen source and/or specific site correctly so that the proper culture media will be selected during laboratory processing.

   l. If a specimen is to be collected through intact skin, cleanse the skin first with Chloraprep (chlorhexidine glucomate scrub).

   m. Before collecting the specimen, consider the risk/benefit ratio of the collection procedure to the patient. For anaerobic specimens, use syringe for collection. **DO NOT SEND SYRINGE WITH NEEDLE ATTACHED.**

Paper Copies are not Document Controlled

n. Specimen acceptability

1) Specimens should have no gross external contamination; use disinfectant to remove spilled specimen from container.

2) Collect adequate specimen type/quantity.

3) Use transport media correctly.

4) Specimen should be placed in suitable preservative(s) when there is a delay in delivery to the lab.

5) Ensure that the swab is placed in transport medium and the ampule is crushed to prevent the swab from drying.

3. **General guidelines for proper specimen transport:**

a. Transport all specimens to the laboratory **promptly.**

1) To ensure the survival and isolation of fastidious organisms and to prevent overgrowth by more hardy bacteria.

2) To shorten the duration of specimen, contact with some local anesthetics used in collection procedures that may have antibacterial activity.

3) To provide a more accurate diagnosis of the infectious disease process.

4) Specimens for Ebola: Contact Infectious Disease and Infection Prevention & Control prior to submitting samples to laboratory.

b. Alternatives to prompt delivery.

Refrigerate most specimens at 2 to 8ºC. The following are **exceptions**:

1) If blood is cultured in Bactec culture bottles or an Myco F/Lytic bottle, hold it at room temperature.

2) Specimens that may harbor temperature-sensitive organisms such as **Shigella spp., Neisseria spp.,** and **Haemophilus influenzae** should be left at room temperature.

3) Never refrigerate spinal fluid (CSF), genital, eye, or internal ear specimens. Hold CSF specimens at **room temperature** unless they are to be cultured for viruses. Alternatively, incubate at 35-37°C.

4) Stool specimens:

a) For bacterial culture, mix stool with Para-Pak Enteric Plus transport medium if stool cannot be plated within 2 hours.

b) For parasitology examination, mix stool with Para-Pak SAF transport medium.

c) Call the lab to obtain these transport media.

4. **Use of specimen transport systems:**

a. **Anaerobic** transport systems are not used at this facility.

1) Alternatively, syringe aspirates may be submitted. Expel the air and recap the syringe. **Do not send syringe with the needle attached**.

Paper Copies are not Document Controlled

2) Pieces of tissue may be transported in a sterile cup containing just enough sterile saline to maintain specimen moisture.

3) Anaerobic organisms are extremely susceptible to an oxygenated environment. The submission of a swab for anaerobic culture may compromise the culture because anaerobic organisms may not survive during the transport time prior to specimen processing. Therefore, the anaerobic culture order will be cancelled). **Send anaerobic culture specimens to the laboratory immediately after collection.**

b. Aerobic transport methods (Swab Transport systems):

Note: Although sterile swabs can be used for collection and transport of specimens, the test request should be considered prior to specimen collection.

Note: Always crush ampoule (with protective sleeve over ampoule) after specimen collection to prevent swab from drying.

c. Specific transport containers for specimens follow:

Transport systems for aerobic specimens

System	Comments
Swab Transport System (Obtain swabs from SPD)	Sterile, disposable culture collection and transport system consisting of plastic tube containing 1 to 2 rayon-tipped swabs and transport medium to prevent drying of bacteria and maintain pH. (**Note**: Always crush ampule [with protective sleeve over ampule] after specimen collection.)
Calcium alginate swabs	Can be toxic for some strains of ***N. gonorrhoeae***, HSV, and ***Ureaplasma urealyticum*** and may be toxic for some cell cultures. Useful for collection of **Chlamydia** cultures and eye cultures.
Cotton swabs	Residual fatty acids may **inhibit** some bacteria and **Chlamydia** spp. If cotton is glued or spun to wooden applicator stick, wooden stick may inactivate HSV and interfere with some **Ureaplasma** identification tests.
Dacron swabs	Useful in collection of viral and Group A streptococcus specimens.
Nasopharyngeal-urethrogenital	Flexible wire shafts and small swab tips provide easier specimen collection, especially for nasopharyngeal specimens, ***B. pertussis***, and male urethral specimens of ***N. gonorrhoeae***.
Sterile screw-cap cups	Useful for collection of urine, sputum, stool, bronchoalveolar lavage, biopsy specimens, and tissues. If biopsy specimen is small, add small amount of sterile non-bacteriostatic 0.85% NaCl to cup. Never place biopsy specimen in formalin or wrap in gauze.
Sterile petri dishes	Useful for hair or skin-scraping specimens. Tape petri dish securely prior to transport. (Contact the Microbiology to obtain petri dishes).
Sterile tubes (screw-cap glass; Sterile or plastic tubes; sterile Vacutainer tubes without additives	Useful for collection of fluids, bronchoalveolar lavage drainage, or brush specimens.
Viral transport system	Enriched transport medium tube for maximum virus stability. Tube contains antimicrobics to inhibit overgrowth of bacteria and fungi. (Contact the Client Services Unit to obtain viral transport medium).
Gray top vacutainer tubes with preservative	Used to aliquot urine specimens for culture and susceptibility.

Laboratory data generated from inappropriately selected specimens can be misleading and can result in erroneous diagnosis and inappropriate therapy. Examples of properly collected specimens are as follows:

Paper Copies are not Document Controlled

Source and type of specimen	Transport method
Arthropods (ticks, mites, bed bugs, etc.)	Collect and transport in dry, rigid container with screw-top lid. Store specimen at room temperature.
Wound Specimens	"Wound" as a specimen label is inadequate. Provide the **specific anatomic site**. Record whether the wound is superficial or deep (surgical). Exudate alone is usually not adequate for culture and often contains confusing commensal flora. The specimen of choice is the advancing margin of the lesion, not a superficial sample from the top of the lesion. Prompt delivery to the laboratory is essential.
Ear Specimens	'Ear' usually indicates a specimen from a patient suffering from otitis media, in which the sample of choice is fluid obtained by tympano-centesis. Use a tiny swab only if the tympanic membrane has ruptured and is draining.
Blood	Blood transport system with SPS (Blood Culture bottles). Collection system for blood culture only. (Contact the Client Services Unit or Microbiology to obtain blood culture bottles and skin prep kits). For fungus or AFB blood culture, Myco / F Lytic bottles, See II.B.1.c. (4 & 5).
Central Nervous System:	
CSF	Sterile screw-cap tube
Ommaya fluid	Sterile screw-cap tube
Brain abscess	Capped syringe
CNS biopsy	If the specimen is small, send in sterile cup with small amount of non-bacteriostatic 0.85% NaCl. (Never place in formalin.)
Gastrointestinal system:	
Feces	Sterile, leak-proof, screw-cap cup; tube with Para-Pak Enteric Plus medium if not submitted to the laboratory within 2 hours.
Rectal swab	Swab transport system (For pinworm, use pinworm collection kit.)
Gastric lavage or washings	Sterile screw-cap cup or sputum trap.
Duodenal aspirate	Sterile screw-cap cup or sputum trap.
Rectal biopsy	Sterile screw-cap cup or tube. If specimen is small, send in sterile cup with small amount of non-bacteriostatic 0.85%NaCl. (Never place in formalin)
Sigmoidoscopy specimen	Sterile screw-cap cup or tube. If specimen is small, send in a sterile cup with small amount of non-bacteriostatic 0.85% NaCl. (Never place in formalin.)
Eye:	
Conjunctival scrapings	Send prepared smears and directly inoculated media. (Obtain media and slide from Microbiology)
Corneal scrapings	Send prepared smears and directly inoculated media. (Obtain media and slide from Microbiology)
Intraocular fluid	Send prepared smears and directly inoculated media or capped syringe with air expelled. (Obtain media and slide from Microbiology)
Genital tract, female:	
Amniotic fluid	Capped syringe
Fallopian tube	Capped syringe
Bartholin fluid	Capped syringe
Cervix	Swab transport, viral or chlamydial transport
Urethra	Swab transport, viral or chlamydial transport
Vagina	Swab transport, viral or chlamydial transport, sterile screw-cap tube with 1 mL of non-bacteriostatic 0.85% NaCl (for trichomonas wet prep analysis only)
Endometrium	Sterile screw-cap cup or tube or anaerobic transport system

Paper Copies are not Document Controlled

Vulva	Capped syringe without needle; swab transport, viral or chlamydial transport
Genital tract, male:	
Anal swab	Swab transport, viral or chlamydial transport
Urethra	Swab transport, viral or chlamydial transport
Epididymis	, Sterile screw-cap cup
Prostatic massage	Sterile screw-cap cup, tube or swab transport system
Semen	Sterile screw-cap cup, or tube
Penile lesion	Capped syringe without needle; swab transport or viral or chlamydial transport system
Penile discharge	Sterile screw-cap tube with 1 mL of non-bacteriostatic 0.85% NaCl (for trichomonas wet prep analysis only
Specimens for *N. gonorrhoeae* Anal, cervical, urethral, vaginal, throat	Swab transport system
Lower respiratory tract:	
Lung biopsy	Sterile screw-cap cup; if specimen is small, place it in a small amount of non-bacteriostatic 0.85% NaCl (never place in formalin)
Expectorated sputum	Sterile screw-cap cup
Induced sputum	Sterile screw-cap cup
Tracheal or endotracheal aspirate	Sputum trap or sterile screw-cap cup
Bronchoalveolar lavage fluid	Sputum trap or sterile screw-cap cup
Bronchial washings	Sputum trap or sterile screw-cap cup
Transbronchial biopsy	Sterile screw-cap cup with 1-2 mL of non-bacteriostatic 0.85% NaCl
Bronchial brush	Sterile screw-cap cup with 1-2 mL of non-bacteriostatic 0.85% NaCl
Transtracheal aspirate	Sterile capped syringe, screw-cap cup
Lung aspirate	Sterile capped syringe, screw-cap cup
Upper respiratory tract:	
Throat	Swab transport or viral transport system
Nasal swab	Swab transport or viral transport system
Oral culture	Swab transport or viral transport system
Nasopharyngeal swab	Swab transport or viral transport system
Tympanocentesis fluid	Capped syringe
Sinus aspirate	Capped syringe
Nasopharyngeal suction	Sterile screw-cap cup or viral transport system
Nasal washings	Sterile screw-cap cup or viral transport system
Sterile body fluids: (excluding CSF, urine, blood) joint and synovial fluids	Sterile screw-cap container, capped syringe without needle, Pleural, peritoneal, ascites,
Subcutaneous tissue and skin	
Ulcers or nodules,	Sterile screw-cap superficial wound (bacterial container or swab transport.)
Biopsy	Sterile screw-cap cup (If specimen is small, add a small amount of sterile non-bacteriostatic 0.85% NaCl to prevent drying).
Exudate	Sterile screw-cap container or syringe without needle
Burn specimens	Sterile screw-cap container or swab transport
Superficial fungal lesion material	Sterile screw-cap container or swab transport
Deep wounds, aspirates, and tissues:	
Site wound	Capped syringe without needle
Deep wounds or abscesses	Sterile screw-cap container, capped syringe without needle
Soft tissue aspirates	Capped syringe without needle
Bone	Sterile screw-cap container (If specimen is small, add a small amount of sterile non-bacteriostatic 0.85% NaCl to prevent drying.)
Skin punch biopsy	Sterile screw-cap container (If specimen is small, add a small amount of sterile non-bacteriostatic 0.85% NaCl to prevent drying.)
	Swabs are a poor choice because they dry easily and there is limited amount of material obtained. Swabs are not acceptable for mycobacterial or fungal cultures.
Urine:	
Clean catch	Sterile screw-cap cup or grey top tube
Ileal conduit	Sterile screw-cap cup or grey top tube
Straight catheter	Sterile screw-cap cup or grey top tube
Suprapubic aspirate	Capped syringe without needle
Bladder washout	Sterile screw-cap cup or tube (be careful to label specimens with correct times and sites.)

Paper Copies are not Document Controlled

Bilateral ureter catheterization	Sterile screw-cap cup or tube (be careful to label specimens with correct times and sites.)

B. Specimen Collection Instructions for Different Anatomic Sites:

1. **Blood cultures:**

a. General considerations:

Number and timing – Most cases of bacteremia are detected by using three sets of separately collected blood cultures. More than three sets of blood cultures yield little additional information. Conversely, a single blood culture set may miss intermittently occurring bacteremia and make it difficult to interpret the clinical significance of certain isolated organisms.

1) **Acute sepsis** – Collect two or three cultures from separately prepared sites prior to starting therapy.

2) **Endocarditis**:

a) **Acute** – Obtain three blood cultures with three separate venipunctures over 1 to 2 h and begin therapy.

b) **Subacute** - Obtain three blood cultures on day 1 (15 minutes or more apart). If all are negative 24 h later, obtain three more.

c) **Anti-microbial therapy** 1 to 2 weeks before admission -- Obtain two separate blood cultures on each of three successive days.

3) **Fever of unknown origin** - Obtain two separate blood cultures at least 1 hour apart. If these have no growth, then 24 to 36 hours later, obtain two more blood cultures 1 hour apart. The yield of information beyond four cultures is usually minimal.

b. **Volume of blood** – The volume of blood is **critical** because the concentration of organisms in most cases of bacteremia is low, especially if the patient is on antimicrobial therapy. Adults: **8-10 mL** of blood per venipuncture. (Collect **1-5 mL** of blood if fungal or mycobacterial culture is requested).

c. **Culture medium and culture technique:**

1) General considerations:

a) Aerobic bottles (color-coded blue) medium used for the isolation of aerobic and facultative anaerobic organisms

b) Anaerobic bottles (color-coded purple) medium used for the isolation of anaerobic organisms

c) Myco/ F Lytic bottles (color-coded red) medium used for the isolation of fungi and mycobacteria.

d) Blood-to-medium ratio should be 1:8 to 1:10 for each bottle (i.e., 8 to 10 mL of blood per bottle).

Note: Yeasts such as Candida and Cryptococcus can be isolated using the standard blood culture system.

Paper Copies are not Document Controlled

d. **Blood collection: See** https://epm601.elsevierperformancemanager.com/Personalization/Home?virtualName=vanorthtexas-txdallas

Blood can be collected by venipuncture of peripheral veins or arteries, and from intravascular catheters. Observe standard (universal) precautions. Wear gloves.

NOTE: **DO NOT PLACE THE ORDER LABEL OVER BOTTLE BARCODE LABEL.**

e. **BLOOD CULTURE LINE DRAWS:** See https://epm601.elsevierperformancemanager.com/Personalization/Home?virtualName=vanorthtexas-txdallas

NOTES:

a) Direct Draw Collection:
If collecting more than one type of blood culture bottle using a butterfly blood collection set and direct draw adapter cap, FIRST collect the **AEROBIC** culture bottle and then the anaerobic culture bottle so that any oxygen trapped in the tubing will not be transferred to the anaerobic bottle.

b) Syringe Draw Collection:
If collecting more than one type of blood culture bottle using a syringe to draw the sample, **FIRST** inoculate the **AEROBIC** culture bottle and then the anaerobic culture bottle so that any oxygen trapped in the syringe will not be transferred to the anaerobic bottle. Line demarcations on the bottle label should be used to assist in estimating the sample volume.

c) Take care to prevent contamination during both bottle preparation and inoculation with the patient sample. Proper skin disinfection is an essential requirement to reduce the incidence of contamination. Contamination could lead to a specimen being determined "true positive" when a clinically relevant isolate is not actually present.

2. Central nervous system (CNS) specimens: https://epm601.elsevierperformancemanager.com/Personalization/Home?virtualName=vanorthtexas-txdallas

a. **Cerebrospinal Fluid (CSF)** – Suggested volumes are 1, 2, and 2 mL for routine, fungal, and mycobacterial cultures, respectively.
b. **Always send the most turbid tube to microbiology**
c. If viral culture is ordered, please contact Referral Testing for transporting requirement.
d. : If only 1 tube of CSF is collected, submit it to Microbiology laboratory first; otherwise, generally submit tube #2.

3. Gastrointestinal tract:

The gastrointestinal tract includes the esophagus, stomach, duodenum/small intestine, colon, and return.

a. Fecal specimens: Submitted primarily for the detection of ***Aeromonas, Campylobacter, Shigella***, and ***Salmonella*** species and in certain cases to detect ***Yersinia, Vibrio*, enterotoxigenic *Escherichia coli, Plesiomonas sp.*** and ***Clostridioides difficile*** **(or toxin)**
Guidelines:

1) No more than 2 specimens/patient will be accepted on separate days for bacterial

Paper Copies are not Document Controlled

culture without prior consultation with the Director Microbiology (limited yield provided by additional specimens).

2) Do not request routine stool cultures or parasite exams on patients whose diarrhea begins >3 days after admission without prior consultation with the Director of Microbiology. Toxin B screen test for *Clostridioides difficile* by PCR should be considered for these patients. (Diarrhea is defined as three or more loose, watery stools in less than or equal to a 24-hour period).

3) Test stool for *Clostridioides difficile* toxin for all patients with clinically significant diarrhea and a history of antibiotic exposure. Submit only one (1) specimen per week. Negative and positive toxin tests should not be repeated within 7 days. No tests should be ordered to determine "cure" of *Clostridioides difficile* infection before transferring the patient to another facility.

4) Keep stool specimen cool; do not incubate.

5) If a stool specimen cannot be plated within 2 hours of collection, it should be mixed with transport medium.

6) Do not use toilet paper to collect stool. Toilet paper may be impregnated with barium salts, which are inhibitory for some fecal pathogens.

7) A single stool specimen may not exclude bacterial or parasitic pathogen as a cause of diarrhea (loose, watery specimen).

8) **Fecal Leukocytes** test is performed for the detection of elevated levels of lactoferrin

b. Have patient obtain stool specimen by one of the following methods:

1) Pass stool directly into a sterile, wide-mouth, leak-proof container with a tight-fitting lid.

2) Pass stool into a clean, dry bedpan and transfer stool into a sterile leak-proof container with a tight-fitting lid.

4. **Rectal swabs:** Submitted primarily for the detection of ***Neisseria gonorrhoeae***, ***Shigella*** species, **Herpes Simplex Virus (HSV)**, and anal carriage of ***Streptococcus pyogenes***.

a. Pass the tip of a sterile swab approximately 1 inch beyond the anal sphincter.

b. Carefully rotate the swab to sample the anal crypts and withdraw the swab.

c. Send the swab in a swab transport system or viral transport media (for HSV).

5. **Gastric aspirates (wash or lavage fluid**): The patient should fast prior to each of the following procedures:

a. **Gastric lavage**: Submitted primarily for the detection of ***Mycobacterium tuberculosis*** in patients unable to produce quality sputum.

b. **Duodenal aspiration:** Submitted primarily for the detection of ***Giardia*** species and larvae of ***Strongyloides stercoralis*** and ***Ascaris lumbricoides.***

6. **Gastric/Rectal biopsies** The patient should fast prior to each of the following procedures:

a. Esophageal, stomach, or duodenum specimens: Esophageal specimens are primarily used to detect **Candida** species, **cytomegalovirus (CMV)**, and **HSV** infections. Stomach and duodenal specimens are primarily used for the detection of ***Helicobacter***

Paper Copies are not Document Controlled

pylori. Duodenal specimens can also be used for the detection of **Giardia** species and the larvae of ***S. stercoralis*** and ***A. lumbricoides***.

b. **Rectal biopsy:** Submitted primarily for the detection of ***Entamoeba histolytica***, ***Balantidium coli***, and **HSV**. If lesions are not evident, biopsy the posterior rectal mucosa below the peritoneal reflection (within 7 to 10 cm of the anal verge).

c. **Small bowel biopsy:** Submitted primarily for the detection of **Giardia, Cryptosporidium**, and **Microsporidium** species. Biopsies of the small intestine provide the highest diagnostic yield for Microsporidia. Biopsies from other gastrointestinal sites (stomach, colon, rectum) have a much lower yield in comparison. Obtain biopsy sample lesion at surgery.

7. **Immunochemical Fecal Occult Blood (iFOBT) Test for Colorectal Cancer Screen**

a. There is no need to change or restrict the patient's diet or medications prior to collecting a test sample.

b. Patients with conditions that may produce blood in the feces (stool), such as hemorrhoids or menstruation, should not proceed with testing while the bleeding persists.

c. Patient Instructions:

1) Open the collection kit. Withdraw the green capped sampling vial and large folded collection paper.

2) Fecal specimen collection:

a) Unfold and place the large collection paper and place it inside the toilet bowl on top of water.

b) Proceed with bowel movement and deposit the feces specimen on top of paper in toilet bowl.

c) Collect the sample from feces before the paper sinks and feces specimen touches the toilet water.

3) Sample inoculation into the vial from kit:

a) Twist and lift the green cap on sample vial to reveal the sample probe that is attached to the green cap.

b) Scrape the surface of the fecal (stool) sample with the probe and rotate probe to coat the grooved portion of the probe with the sample.

c) Replace the probe into vial and PUSH green cap tightly until it snaps. DO NOT re-open the cap and DO NOT break or puncture the seal on the vial end containing the liquid.

d) Flush the specimen remaining on the paper, as this paper is biodegradable and will not harm septic systems.

4) If sample vial is not already pre-labeled with the patient's name and full social security number, be sure to label the vial with this information.

5) Place the sealed sample vial(s) into the plastic biohazard bag. Place the biohazard bag inside the pre-addressed mailing envelope and seal the envelope. Mail the envelope containing the sample(s). No postage is necessary.

Paper Copies are not Document Controlled

6) The sample vial(s) must be received in the testing laboratory within 15 days. **NOTE:** The majority of these samples are collected by the patient and mailed to the laboratory. Collection time is based on when the sample arrives to the laboratory

8. **Pinworm:** Submitted primarily for the detection of *Enterobius vermicularis*
   a. Remove the cap from the collector vial.
   b. Press the stick side of the paddle (marked ADH) to perianal with moderate pressure.
   c. Place the labeled paddle into the vial.
   d. Transport vial to the laboratory in a biohazard bag.

9. **Sigmoidoscopy**: Useful in the detection of ***E. histolytica*** and Mycobacterium species and the diagnosis of pseudomembranous colitis associated with ***C. difficile*** and possibly ***Staphylococcus aureus*.**

10. **Genital tract specimens:**

    a. **Female:**

    Genital tract specimens are submitted primarily for the detection of sexually transmitted pathogens (such as ***N. gonorrhoeae, Chlamydia trachomatis*, Lymphogranuloma venereum, HSV, Human Papillomavirus [HPV]** [with histological confirmation], trichomonads, ***Haemophilus ducreyi***, **Group B Streptococcus**, **Gardnerella** and **Candida** infections). If infection is not caused by any of these pathogens, anaerobic bacteria may be involved. If an anaerobic infection is suspected, transport the specimen in a capped syringe. (For chlamydia and viral transport systems, see Immunopathology and Referral Testing section of this manual.)

    1) **Amniotic fluid:**

       a) Aspirate fluid by catheter, at cesarean section, or at amniocentesis.

       b) Transfer fluid to a capped syringe.

       c) Transport to the laboratory within 15 minutes at room temperature.

    2) **Bartholin gland:** Decontaminate the mucosa with povidone-iodine and aspirate material from the duct(s). Collect in a capped syringe.

    3) **Cervix:**

       a) Do not use lubricant during procedure.

       b) Wipe the cervix clean of secretions and mucus.

       c) Rotate a sterile swab and obtain exudate from the endocervical glands.

       d) If no exudate is seen, insert a sterile swab into the endocervical canal, and rotate the swab.

    4) **Endometrium**: Collect endometrium specimens by transcervical aspiration through a telescoping catheter. Place in sterile screw cap cup or tube.

    5) **Fallopian tubes**: Obtain aspirates (preferably) or swab specimens during surgery. Bronchoscopy cytology brushes may be used if exudate is not expressed. Place in a capped a syringe.

    6) **Urethra:**

Paper Copies are not Document Controlled

a) Collect specimens 1 hour or more after patient has urinated.

b) Collect the discharge with a sterile swab.

c) If discharge cannot be obtained, wash external urethra with betadine soap and rinse with water. Insert a urethro-genital swab 2 to 4 cm into the endo-urethra, gently rotate the swab, and leave it in place for 1 to 2 seconds. Withdraw the swab and submit it in the appropriate transport system for culture.

7) **Vagina:** Use a speculum without lubricant. Collect secretions from the mucosa high in the vaginal canal with sterile pipette or swab.

8) **Vulva lesion:**

a) Transport specimen to the laboratory within 2 hours of collection at room temperature.

b. **Male:**

1) **Epididymis:** Used primarily to diagnose nonspecific bacterial epididymitis and sexually transmitted epididymitis. Bacterial epididymitis is most commonly due to members of the family Enterobacteriaceae or pseudomonads and generally occurs in men over 35 years of age. ***M. tuberculosis*** infections generally occur after involvement of the prostate or seminal vesicles. Sexually transmitted epididymitis is most commonly due to ***C. trachomatis*** and ***N. gonorrhoeae***.

a) Use a needle and syringe to aspirate material from the epididymis.

b) Transport the specimen to the laboratory in a capped syringe without the needle attached.

2) **Penile lesion**: Used primarily to detect sexually transmitted pathogens such as ***N. gonorrhoeae.***

3) **Prostatic massage**: Used primarily to diagnose acute or chronic prostatitis. For both diseases, gram-negative enteric organisms are the most frequently isolated pathogens. ***N. gonorrhoeae*** is found infrequently but is sometimes implicated in acute prostatitis.

4) **Urethra:** Used primarily to detect ***N. gonorrhoeae***

Collection considerations for genital tract specimens

Culture	**Recommended specimens**
N. gonorrhoeae	Cervical, urethral, anal, throat, or vaginal swabs
Bacteria	Prostatic fluid, cervical, vaginal
Trichomonas vaginalis (Wet Prep Exam)	Vaginal, prostatic fluid
Fungi	Anal, vaginal, or cervical
Anaerobes	Epididymis aspirate, amniotic fluid, abscess fluid
LGV	Rectal, cervical, urethral, bubo or ulcer material
H. ducreyi	Material from ulcers of genitalia and perianal areas and from inguinal nodes
Gardnerella	Vaginal

NOTE: The Microbiology Laboratory will perform a bacterial culture for ***N. gonorrho*ea**. If PCR testing for ***N. gonorrhoeae* and/or *Chlamydia trachomatis*** is desired, refer to the Molecular Diagnostics Laboratory for specimen requirement for testing.

Paper Copies are not Document Controlled

11. **Ocular specimens:**

a. **General considerations:**

1) Obtain viral and chlamydial samples before topical anesthetics are instilled.

2) Obtain samples for chlamydia cultures with calcium alginate swabs and for viral cultures use viral transport medium.

3) Obtain media from the microbiology laboratory.

4) Send prepared smears and inoculated media to the laboratory immediately.

b. **Conjunctival scrapings:**

c. **Corneal scrapings:**

1) Obtain conjunctival samples prior to corneal scrapings. Sometimes conjunctival cultures are helpful in assessing the possibility of contamination of corneal cultures.

d. **Intraocular fluid:**

1) Use a needle aspiration technique to collect intraocular fluid.

Collection considerations for ocular specimens

Culture	**Comments**
Bacteria	Inoculate medial directly with ocular scrapings. If ***N. gonorrhoeae*** is suspected, inoculate a Modified Thayer-Martin agar plate also.
Fungi	Inoculate media directly with ocular scrapings.
Anaerobes	Inoculate medium directly. If inflammation occurs after extracapsular cataract extraction, rule out ***Propionibacterium sp.***
Parasites	Use to detect ***Acanthamoeba sp.***
Mycobacteria	Inoculate medium directly with ocular scrapings.

12. **Respiratory specimens:**

a. **General considerations:**

1) 24-hour sputum collections are not recommended for culture.

2) If ***Corynebacterium diphtheriae***, ***Arcanobacterium haemolyticum***, ***Bordetella pertussis***, ***N. gonorrhoeae***, **legionellae, chlamydiae,** or **mycoplasma** are suspected, the physician should contact the clinical microbiology laboratory prior to specimen collection because special techniques and/or media are required for the isolation of these agents.

3) Only 1 specimen collection per 24-hour period will be processed for cultures. Do not submit more than 3 specimens per week. On patients with known mycobacterial infections, order up to three (3) consecutive specimens (per patient) every eight hours for AFB culture and smear. For subsequent specimens, order one (1) AFB smear per week until the smear becomes negative. Once the smear result is negative, order three (3) additional specimens for AFB culture and smear.

4) Each respiratory specimen submitted for bacterial culture specimen is reviewed microscopically and graded for acceptability prior to processing.

Paper Copies are not Document Controlled

5) Specimens for mycobacterial culture should be collected appropriately and transported to the laboratory without delay. If there is a delay, refrigerate specimens.

b. **Lower respiratory tract:**

1) **Expectorated sputum:**

a)

NOTE: Sputum may not be the specimen of choice for diagnosing bacterial pneumonia. Blood cultures, bronchoalveolar lavage, or transtracheal aspirate are more likely to provide the etiologic agent.

2) **Induced sputum:**

3) **Tracheostomy and endotracheal aspiration:** Tracheostomy is followed by colonization within 24 h of insertion of the tube. Results must be correlated with clinical findings such as fever or infiltrate on chest X-ray. Aspirate the specimen into a sterile sputum trap.

4) **Bronchoscopy specimens:** Bronchoscopy specimens include bronchoalveolar lavage, bronchial washing, bronchial brushing, and transbronchial biopsy specimens.

c. **Upper respiratory tract infections:**

1) **Throat (pharyngeal specimens**): Submitted primarily for the detection of **Group A streptococcus *(Streptococcus pyogenes)*** (can also be used to detect ***N. gonorrhoeae*, *Haemophilus influenzae*** [for epiglottitis], and ***A. haemolyticum*** [very rare]).

a) Do not obtain throat samples if epiglottis is inflamed, as sampling may cause serious respiratory obstruction.

2) **Nasal swabs**: Primarily used for the detection of staphylococcal carriers and MRSA Directive (nasal) Screen.

Use the COPAN brand (red capped) swab system for MRSA Directive specimens.

3) **Nasopharyngeal suction**: Submitted for the detection of carriers of ***S. pyogenes, Neisseria meningitidis, C. diphtheriae***, and ***B. pertussis.*** Suction material from the nasopharynx and collect it in a sterile container.

4) **Nasopharyngeal swab**: Submitted primarily for PCR testing for respiratory pathogens. Carefully insert a flexible-wire flock swab from the Universal Transport Medium collection kit through the nose into the posterior nasopharynx and rotate the swab (Keep the swab near the septum and floor of the nose). Allow to sit for 10-15 seconds to absorb the nasopharyngeal fluids.

5) **Nasal washing**: Submitted primarily for viral cultures

6) **Sinus aspirate:**

a) Send the specimen in a capped syringe to the laboratory.

7) **Tympanocentesis fluid:** Submission of tympanocentesis is reserved for

Paper Copies are not Document Controlled

complicated, recurrent, or chronic persistent otitis media. Submit only when previous therapy has failed. A swab **is not** recommended for collecting specimens to diagnose otitis media infections.

8) **Oral cultures**: Used to prepare smears for the detection of yeast or fuso-spirochetal disease.

Collection considerations for respiratory specimens

Culture	Volume (mL)	Comments
Anaerobes	1	Sinus aspirate, tympanocentesis fluid, trans-tracheal aspirate, and lung aspirates or biopsy specimens are appropriate.
Bacteria	1	Make a specific request if Legionella suspected. Submit sputum only; saliva is unacceptable. One (1) specimen per day will be processed.
Fungi	3-5	Collect three early-morning fresh specimens resulting from deep cough or sputum induction on 3 consecutive days. Lung biopsy specimens or lung aspirates are also appropriate.
Mycobacteria	5-10	Collect fresh early-morning specimens on three consecutive days, resulting from deep cough or sputum induction. Lung biopsy specimens or lung aspirates are also appropriate. Deliver to the laboratory promptly.
Pneumocystis spp.	2	Use induced sputum, bronchoalveolar lavage fluid, or lung biopsy specimen.

13. Sterile body fluid (excluding CSF, urine, and blood):

a. Clean the needle puncture site with alcohol,and disinfect it with iodine solution (1 to 2**If the specimen is collected into blood culture media, a specimen collected into a sterile, leak-proof container should also be submitted. Samples submitted in swab transport medium are unacceptable and will be rejected.**

Collection consideration for sterile body fluids

Culture	Volume (mL)	Comments
Anaerobes	1-5	This specimen may also be used for Bacterial culture. A separate "aerobic" specimen is not necessary. Use a syringe for collection.
Bacteria	1-5	If gonococcal arthritis is suspected, notify the laboratory to add Modified Thayer-Martin plate.
Fungi	>10	Blood for *Histoplasma capsulatum* (AIDS), *Cryptococcus sp*., *Candida albicans*, and *Candida tropicalis*
Mycobacteria	>10	

14. Subcutaneous tissue and skin specimens:(Record specific anatomic site in the request).

a. **Burn specimen** – The surfaces of burn wounds will become colonized by the patient's microbiota or by environmental organisms. When the organism load is large, infection of underlying tissue may occur, and bacteremia may ensue. Cultures of the surface alone are misleading; therefore, biopsies of deeper tissue are often indicated. Additionally, organisms may not be distributed evenly, so sampling of different areas of the burn is recommended.

b. **Superficial wound, bacterial:**

Paper Copies are Not Document Controlled

1) **Syringe aspiration is preferable to swab collection.**

c. **Superficial wound, fungal:**

d. **Ulcer and nodule:**

e. **Skin Scraping for Itch Mite and Follicle Mite Exam:** The diagnosis can be confirmed by demonstration of the mites, eggs, or scybala (fecal pellets). Because the mites are located under the surface of the skin, scraping must be made from the infected area.

1) Scrape vigorously six (6) or seven (7) times to remove the top of the papule. (There should be tiny flecks of blood).

2) Transfer scraped material to a sterile screw capped container (an applicator stick can be used).

f. **Intravenous Catheter Tip:** [Central Line and PICC (Peripherally Inserted Central Catheter), Swan-Ganz, Hickman] and **Intravascular Catheter Tip** – When colonization of an indwelling catheter is suspected as the focus for septicemia, the catheter tip may be cultured. The number of colony-forming units of bacteria on the catheter tip directly relates to whether it is the source of the infection.

1) Deliver the labeled specimen to the laboratory or refrigerate if there will be a delay in delivery.

Collection considerations for subcutaneous tissue and skin specimens

Culture	Comments
Anaerobes	Uncommon in burn, ulcer, nodules, or superficial skin infections; useful following bites and trauma
Bacteria	Syringe aspirates or biopsy specimens are preferable to swab specimens.
Fungi	Useful in diagnosing dermatophytes, yeast, filamentous fungi, and dimorphic fungi
Mycobacteria	Useful in diagnosing ***Mycobacterium marinum***, ***M. fortuitum***, and ***M. chelonei***

15. Deep wounds, aspirates, and tissue specimens: These specimens require prompt delivery to the laboratory

a. **Bite wound:** Aspirate pus from the wound, or obtain it at the time of incision, drainage, or debridement of infected wound. (Do not culture fresh bite wounds, as infectious agents will likely not be recovered.)

b. **Bone:**

1) Obtain bone specimen at surgery.

2) Submit in sterile container without formalin. Specimen may be kept moist with sterile 0.85% NaCl.

c. **Deep wound or abscess:**

1) Disinfect the surface.

2) Aspirate the deepest portion of the lesion, avoiding contamination by the wound surface. If collection is done at surgery, a portion of the abscess wall should also be sent for culture.

Paper Copies are not Document Controlled

d. **Skin Punch biopsies:**

e. **Soft tissue aspirate:**

Collection considerations for deep wound, aspirate, and tissue specimens

Culture	Comments
Anaerobes	Useful in diagnosing actinomycosis; send in sterile container with saline or collect in a syringe.
Bacteria	Biopsy specimens or aspirates are better than swab specimens.
Fungi	Useful in diagnosing ***Pseudallescheria boydii, Bipolaris spp., Exophiala spp.***, and ***Fusarium spp.***
Mycobacteria	Useful in diagnosing ***Mycobacterium tuberculosis, M. bovis***, and ***M. kansasii***

16. Urine:

a. **General consideration:**

1) Never collect urine from a bedpan or urinal.

2) Thoroughly clean the urethral opening (and vaginal vestibule in females) prior to collection procedures to ensure that the specimen obtained is not contaminated with colonizing microorganisms.

3) Soap rather than disinfectants, is recommended for cleaning the urethral area. If disinfectants are introduced into the urine during collection, they may be inhibitory to the growth of microorganisms.

4) Transport specimen to laboratory within 2 hours of collection. If it cannot be transported within 2 hours of collection, the urine specimen should be refrigerated or transferred into a sterile grey top urine preservative tube. (Bacterial counts remain stable for at least 24 hours at 4ºC or 3 days if in a sterile grey top urine preservative tube that is kept at room temperature). **Do not freeze.**

5) Use a sterile cup or tube to transport urine.

6) Transport suprapubic bladder aspirate (SPA) specimens for anaerobic culture in a capped syringe.

7) Always transport urine for viral cultures on wet ice in a sterile container.

8) Any urine collection procedure involving catheterization must be done with scrupulous aseptic technique to avoid introducing microorganisms.

9) Send the first morning voided urine. Three consecutive first morning urine specimens are recommended for mycobacterial culture.

10) Do not submit 24-hour collections for culture.

11) Do not submit Foley catheter tips for culture.

b. **Collection techniques:**

1) **Clean-catch urine specimen (female):**

a) The person obtaining the urine specimen should wash hands with soap and water, rinse, and dry. If the patient is collecting the specimen, she should be

Paper Copies are not Document Controlled

given detailed instructions.

b) Cleanse the urethral opening and vaginal vestibule area with towelette.

c) Hold labia apart during voiding.

d) Allow a few milliliters of urine to pass. **(Do not stop the flow of urine.)**

e) Collect the midstream portion of urine in a sterile, screw capped container.

f) Wash hands.

2) **Clean-catch urine specimen (male):**

a) The person obtaining the urine should wash hands with soap and water, rinse, and dry. If the patient is collecting the specimen, he should be given detailed instructions.

b) Cleanse the penis, retract the foreskin (if not circumcised), and wash with towelette.

c) Keeping foreskin retracted (to minimize contamination with skin flora), allow a few milliliters of urine to pass. **(Do not stop the flow of urine.)**

d) Collect the midstream portion of urine in a sterile, screw capped container.

e) Wash hands.

3) **Ileal conduit urine:**

4) **Straight catheter urine:** (in/out catheter urine specimens): In/out catheter urine specimens are useful when clean-catch urine cannot be obtained or when results from clean-catch urine specimens are equivocal and a diagnosis is critical.

5) **Indwelling catheter urine:** Indwelling catheters are placed in patients who are unable to pass urine.

6) **Suprapubic Aspiration (SPA) of the urinary bladder:** SPA is useful in determining urinary infection in adults in whom infection is suspected and for whom results from routine procedures have been equivocal and diagnosis is critical.

7) **Bladder washout test** (Fairly): The bladder washout test is useful in determining the site of infection in the urinary tract. Results are equivocal in about 10 to 20% of patients.

a) Submit the initial and timed collection samples to the clinical microbiology laboratory for culture. **(Note: It is imperative that <u>each</u> specimen container be clearly labeled with the time of specimen collection.)**

8) **Cystoscopy: bilateral ureteral catheterization:** Bilateral ureteral catheterization is useful in determining the site of infection in the urinary tract.

Collection considerations for urine specimens

Culture	Volume (mL)	Comments
Anaerobes	1	Use suprapubic aspirate. Send specimen in a capped syringe.
Bacteria	0.5-1	Do not collect 24-hr specimen. After proper cleansing of patient, use first morning midstream void.
Fungi	>20	Do not collect 24-hr specimen. Fresh first morning void into a

Paper Copies are not Document Controlled

		sterile urine cup is recommended.
Mycobacteria	>20	Do not collect 24-h specimen. Fresh first morning voided urine specimens voided into a sterile urine cup on three consecutive days are recommended

III. ADDITIONAL TESTS (other than routine cultures):

A. **CSF, CNS:** common parasites include *Acanathamoeba* sp., *Balamuthis mandillaris, Echinococcus,* larval cestodes, microsporidia, *Naegleria fowleri*, *Taenia solium, Toxoplasma gondii, and Trypanosma* sp. Deliver specimens to the laboratory ≤15 minutes at room temperature.

B. ***Corynebacterium diphtheriae* Culture (SEND-OUT/REFERRAL Test):** please contact the Client Services Unit, ext. 7691.

C. **SPECIAL TESTS:**

1. **Rickettsia:** specimen culture (Rocky Mountain Spotted Fever); this is a SEND-OUT REFERRAL test, please contact the Client Services Unit, ext. 70691.

2. **Leptospira culture:** this is a SEND-OUT/REFERRAL test, please contact the Client Services Unit, ext. 70691.

3. ***Bordetella pertussis:* for PCR Test.** This is a SEND-OUT/REFERRAL test, please contact the Client Services Unit, ext. 70691.

4. **CSF Bacterial Antigen Screen: (***Neisseria meningitidis, Streptococcus pneumoniae*, and *Haemophilus influenzae,* type B*)*
   a. Send-out/Referral test

   b. Order a Bacterial Antigen Panel (Bacterial Antigen PNL) which includes the antigen test and a culture.

Paper Copies are not Document Controlled

OUTPATIENT PHLEBOTOMY

TELEPHONE: Extension: 70719

LOCATION: Clinical Addition, Room 1B-220

PHLEBOTOMY SUPERVISOR: Selma Gomez Carney, MT(ASCP)^{CM}, Extension: 70719

I. GENERAL INFORMATION:

A. Ambulatory and clinic patients may be sent to the outpatient blood collection room (1B-220) between the hours of 0600 and 1630, Monday through Friday. The room is open on a limited basis every Saturday from 0600 to 1430. Outpatient Phlebotomy services are not available on Sundays or holidays. Outside these hours, phlebotomy will be performed by nursing personnel or physicians.

B. All sample collections performed in this area must be ordered through VistA using the "Send Patient" option. Patients do not require an appointment for phlebotomy services. Outpatients are processed into the phlebotomy area in order by a numerical queuing system.

II. SPECIMEN COLLECTION:

Blood and urine samples are collected from outpatients and ambulatory inpatients during normal operational hours. Blood samples are collected by routine venipuncture from the upper extremities only, and only if free from IV lines or shunts. Phlebotomy staff will not perform or assist with arterial punctures or femoral venipunctures. Refer to VANTHCS Memorandum 113-01 Phlebotomy Services for detailed information.

A. SUPPLIES REQUIRED (VENIPUNCTURE):

1. Disposable non-latex gloves

2. Tourniquet (non-latex). Discard after single use

3. Needle holder – available for corresponding gauge needles.

4. Sterile needle – needles are packaged in individual color-coded containers by gauge size. The larger the number, the smaller the gauge or needle diameter. This facility generally uses 21-gauge needles, 1.5-inch long. Smaller 23-gauge "butterfly" needles are available for smaller veins.

5. Vacutainer tubes – collection tubes that fill with a pre-determined volume of blood via vacuum action. The caps of the tubes are color-coded to indicate the type of anticoagulant (if any) they contain to prevent the blood sample from clotting. The appropriate anticoagulant is critical for laboratory analysis of the sample.

6. Antiseptic – 70% isopropyl alcohol pads are available for cleaning the phlebotomy site. In most cases, this is sufficient; however, when drawing blood alcohol levels, or for patients with an alcohol allergy, use a Betadine™ swab as a substitute.

7. Gauze pads – applied to the venipuncture site when removing the needle.

8. Puncture-resistant disposal containers – also referred to as "SHARPS" containers, serve as a safe receptacle for all discarded needles.

Paper Copies are not Document Controlled

B. VENIPUNCTURE PROCEDURE:

1. Assemble all supplies in an easily accessible site before beginning the procedure and put on the gloves. **NOTE:** Standard precautions must be observed throughout this procedure.

2. Staff members will verify the patient's full name and DOB– with either the patient's verbal response or identification card (see VII, B.), with the information on the printed labels. The full SSN will also be verified with the printed labels.

3. Put the patient at ease. Reassure the patient that although the venipuncture might be slightly painful, it will be of short duration.

4. Place the patient in a position comfortable for both the patient and the phlebotomist. Position the patient's arm on a secure surface. Ensure the patient's hand is tightly closed – veins are more easily visualized and entered when the patient forms a fist.

5. Apply the tourniquet firmly. Do not allow the tourniquet to remain on the arm for more than 1 minute. Longer periods of time are uncomfortable to the patient and can cause a hematoma and erroneous lab results. Discard the non-latex tourniquet after each patient. **Do not reuse!**

6. Select the appropriate vein site. Generally, the anterior surface of the arm at the joint is the best choice for phlebotomy.

7. Thoroughly cleanse the site using a fresh alcohol pad with a circular motion from the center of the site outward. Allow the area to dry. Avoid retouching the area after cleaning. The site and gloved finger can be cleaned with 70% isopropyl alcohol pad if it must be touched again after cleaning.

8. Perform the actual venipuncture

   a. Thread the needle onto the needle holder. Insert the sample tube into the holder and onto the needle. Avoid pushing the tube completely onto the needle as this will cause loss of vacuum in the tube.

   b. Firmly grasp the patient's arm, using the thumb and fore finger to draw the skintight over the puncture site and anchor the vein. With the bevel up, align the needle with the vein and insert in a smooth and steady motion.

   c. Grasp the flange of the needle holder and push the tube forward until the end of the needle punctures the stopper. Maintain the tube below the level of the needle insertion site. Once the draw is started, do not change the position of the tube until it is filled and ready to be removed.

   d. Fill the tube until the vacuum is exhausted and the blood flow ceases. Remove the tube from the holder and insert the next tube (see correct order of draw, below). Be sure to keep the needle steady in the patient's arm while changing tubes to avoid scratching the inside of the vein or pushing entirely through it, both painful to the patient.

   e. Gently mix every tube thoroughly (5-10 times) as it is removed from the holder to ensure proper mixing of clot activator or anticoagulant. Plain plastic tubes contain clot activator to promote clotting and also need to be mixed thoroughly.

Paper Copies are not Document Controlled

f. Order of draw*:

TUBE	ADDITIVE	NUMBER OF INVERSIONS	BLOOD VOLUME (To Capacity)
1. Blood Culture(s): 1st Aerobic 2nd Anaerobic	List of Ingredients **Aerobic**: 25 mL Enriched Soybean-Casein Digest broth (TSB) • 0.05% Sodium Polyanetholesulfonate (SPS) • Cationic and Non-ionic Adsorbing Resins • Carbon dioxide (CO2) • Oxygen (O2) • Sensor for the detection of fluorescence **Anaerobic:** 25 mL pre-reduced enriched Soybean-Casein Digest broth. • 0.05% SPS • Resins • CO2 and Nitrogen gas (N2) • Sensor for the detection of fluorescence.	0	10 mL
2. MycoF Lytic	List of Ingredients 40 mL Processed Water • Middlebrook 7H9 Broth Base • Brain Heart Infusion • Casein Hydrolysate • Supplement H • Inositol • Glycerol • SPS • Tween 80 • Pyridoxal HCl • Ferric Ammonium Citrate • Potassium Phosphate • Saponin • Antifoam • CO2 and O2 • Sensor for the detection of fluorescence.	0	3 mL to 5 mL
3. Blue top tube	Buffered sodium citrate 0.109 M (3.2%) plastic	3 - 4	2.7 mL
4. Royal Blue top tube w/red stripe	Clot activator (plastic serum)	5 - 6	6 mL
5. Red top tube	Clot activator, Silicone coated (plastic)	5 - 6	6 mL
6. Gold ("tiger") top tube	Clot activator and gel for serum separation	6	5 mL
7. Green top tube	Sodium heparin	8 - 10	4.0 mL
8. Light green top tube	Lithium heparin and gel for plasma separation	8 – 10	4.5 mL
9. Royal Blue top tube w/lavender	K2EDTA	8 – 10	6 mL
10. Lavender top tube	Spray-coated K2EDTA	8 – 10	4 mL / 6 mL/ 10 mL
11. Pink top tube	Spray-coated K_2EDTA	8 – 10	6 mL
12. Grey top tube	Potassium oxalate	8 – 10	4.0 mL
13. Yellow top tube	Acid citrate dextrose Additives (ACD):Solution A -22.0 g/L trisodium citrate, 8.0 g/L citric acid, 24.5 g/L dextrose	8 – 10	10 mL

***Note**: When the first sample to be collected is a coagulation test using a winged ('butterfly') set, allowance must be made for the dead space in the collection tubing. A waste tube (blue top) must be collected and discarded before the patient sample tube.

****Note: If blood cultures are to be collected also, they must be drawn before the blood-tubes are collected.**

g. When all tubes have been drawn, have the patient unclench fist, remove, and discard the tourniquet.

h. Place a gauze pad over the venipuncture site and apply light pressure as the needle is withdrawn. Avoid scratching the patient's arm. **ALWAYS** activate the safety device

Paper Copies are not Document Controlled

used before discarding the entire setup into the sharp's container. **NEVER** remove the needle from the holder.

i. After the venipuncture site has stopped bleeding, apply a bandage and instruct the patient to leave it on at least 10-15 minutes before removing.

j. Label all the tubes, in front of the patient, with the patient's full name, full DOB, date and time of collection, collector's initials, and full SSN. This can be done using a barcoded label or a hand-written label. Ask the patient to verify the information on the labeled specimens is their correct identification information.

C. SUPPLIES REQUIRED (URINE COLLECTION):

Containers: The acceptable container for a single-collection random or spot urine sample is the BD Vacutainer urine cup. A clean catch midstream urine sample is required for urine culture.

D. URINE COLLECTION PROCEDURE:

1. CLEAN CATCH MIDSTREAM (CCMS) SAMPLE: MALES

a. Instruct the patient to wash hands and the end of his penis with provided towelettes and let dry.

b. After allowing some urine to pass into the toilet, the patient should collect urine in the sterile wide-mouth container provided. Do not allow the inside or lip of the container to contact the hands or other parts of the body. A minimum of 10 mL must be collected. Wash hands.

c. The specimen should be delivered immediately to the laboratory. It can be stored temporarily in the refrigerator (2°-10°C); however, urinalysis must be performed within 2 hours of collection.

2. CLEAN CATCH MIDSTREAM (CCMS) SAMPLE: FEMALES:

a. Instruct patient to wash hands.

b. Instruct the patient to sit in a comfortable position on the toilet, swinging one leg to the side.

c. Have the patient spread the labial folds with one hand and cleanse the area with provided towelettes.

d. After allowing some urine to pass into the toilet, the patient should collect urine in the sterile wide-mouth container provided. Do not allow the inside or lip of the container to contact the hands or other parts of the body. Re-cap the container securely. A minimum of 10 mL must be collected. Wash hands.

e. The specimen should be delivered immediately to the laboratory. It can be stored temporarily in the refrigerator (2°-10°C); however, urinalysis must be performed within 2 hours of collection.

3. FIRST MORNING VOID:

First morning void samples are collected immediately after the patient arises in the morning. This sample is generally optimal for most analytical purposes, since it assures that the urine has been held in the bladder a sufficient length of time and is unaffected by daytime variations such as dietary influence and physical activity.

4. 24-HOUR SPECIMEN:

Paper Copies are not Document Controlled

24-hour urine samples may be required for certain tests. An additive may be in the brown plastic urine collection jug, depending upon the test. Refer to the Core Lab – Chemistry Section of this manual for specific information on these samples.

5. SPECIMEN IDENTIFICATION:

All samples must be labeled with the patient's full name, full DOB, and full SSN. This can be done using a barcoded label or a hand-written label. Also required are the specimen type, date and time of collection, and the collector's initials.

Paper Copies are not Document Controlled

INPATIENT PHLEBOTOMY

TELEPHONE: Extension: 70736

LOCATION: Clinical Addition, Room 1B-154

PHLEBOTOMY SUPERVISOR: Selma Gomez Carney, MT (ASCP)^{CM}, Extension: 70698/70736

I GENERAL INFORMATION:

A. The Inpatient Phlebotomy Section will provide collection of patient blood samples from inpatients between the hours of 5:00 a.m. and midnight, seven days a week including holidays.

B. Orders must be placed in CPRS at least 30 minutes prior to the desired scheduled collection time: order "lab collect" or "immediate lab collect". Routine phlebotomy (lab collect) will be performed periodically throughout each day beginning at 5:00 a.m.

C. The last routine collection round will be done at 10:00 p.m. so any lab test request entered after 9:45 p.m. will be dropped from the system; the Lab collect list does not roll over to the next day.

D. Immediate lab collect orders will be available from 5:00 a.m. until 11:30 p.m. Remember that the order MUST be placed at least 30 minutes prior to the scheduled collection time.

E. Early morning phlebotomy rounds begin at 5:00 a.m.

F. All laboratory test requests, except for Anatomic Pathology and Blood Bank, must be entered into CPRS before the samples are delivered to the laboratory. Blood Bank collection requests must always be called to In-patient Phlebotomy section (x70736).

II. SPECIMEN COLLECTION:

A. The P&LMS Inpatient section will collect blood samples from specific units; however, the following units are **NOT** collected by the P&LMS Inpatient section: Intensive care units (MICU, SICU, TICU, CCU), Dialysis (3A), Emergency Department (ER), Post Anesthesia Care Unit (PACU), Same Day Procedure (SDP), Cardiac catheterization and/or electrophysiology sections, Radiology Suites and the Domiciliary. Use 'Ward Collect' to order lab tests for these areas.

B. The P&LMS Inpatient Phlebotomy Section will not collect blood samples from IV lines or other indwelling devices, PICC lines, arterial samples, or femoral venipunctures. These samples will be collected by the IV team or by appropriately trained unit personnel (not P&LMS) and will be ordered 'Ward Collect'.

C. Staff members will verify the patient's full name and full SSN with the patient's identification band and with the information on the printed labels prior to performing venipuncture.

D. All samples must be labeled, in front of the patient, with the patient's full name, full date of birth (DOB), and full social security number. This can be done using a barcoded label or a hand-written label. Also required are the date & time collected and the collector's initials.

E. Refer to the P&LMS webpage section under "**Laboratory Test Orders and Phlebotomy Information"** for more detailed information. A detailed venipuncture procedure can be found in the Outpatient Phlebotomy section of this manual: part II "Specimen Collection", section B "Venipuncture procedure".

Paper Copies are not Document Controlled

STAT LAB – OPERATING ROOMS (ANCILLARY TESTING DEPARTMENT)

TELEPHONE: Extension: 75099

LOCATION: Room 5B-408A

DIRECTOR: Ellen Araj, M.D. Extension: 70697

ANCILLARY TESTING COORDINATORS:

Jacquelyn Gray, MT(ASCP),	Extension: 70713	Pager: 214-759-3051
Tamara West, MS-CPM, MLS(ASCP)^{CM}	Extension: 73697	Pager: 214-344-0538
Christy Clemens, MLS(ASCP)^{CM}	Extension: 74923	Pager: 214786-2811

I. HOURS OF OPERATION/TESTING PERSONNEL:

Days	Time	Personnel to Process Specimens
Monday – Friday	6:30 a.m. – 11:00 p.m.	Arterial Blood Gases (ABG OR Panel-POC), Activated Clotting Time (AC), and finger stick glucose-OR Anesthesia Staff.
Monday – Friday	11:00 p.m. – 6:30 a.m.	Arterial Blood Gases –Respiratory Department All other samples – Client Services/Immunology (CSI)
Weekends & Holidays	24 hours	On-Call Anesthesia Tech. In the event the on-call is not called in: Arterial Blood Gases – Respiratory Department All other samples – Client Services Unit

A. The OR STAT lab is open Monday through Friday 6:30 a.m. – 11:00 p.m. It is staffed by the Anesthesia department. During instrument downtime, due to problem or maintenance, the TICU/SICU is available as a backup for patient blood gas testing.

B. After 11:00 p.m. until 6:30 a.m., Monday through Friday, send arterial blood gas samples to the Respiratory Lab.

- Notify the Respiratory Therapist in TICU/SICU at pager numbers 214-759-0671 or 214-759-0998 to inform them an OR arterial blood gas sample is coming. If no response from the pagers, call the operator and ask for the pager number of the Respiratory Therapist covering TICU/SICU.

C. On holidays and weekends, the on-call anesthesia technician will perform testing. In the event the technician is not called in, notify the Respiratory Department for blood gas testing needs as in B. above.

D. Send all other samples (in a biohazard bag) to the CSI Unit via the dumbwaiter. Call 76043 to notify CSI that a specimen is in transit. All orders must be marked appropriately on the Test Requisition Sheet which must also include the patient's full name, full social security number, patient location, date/time of collection, ordering physician, and contact phone number. Lab staff will order the tests as a Medical Emergency and immediately deliver the specimens to the Core Laboratory for analysis.

II. GENERAL INFORMATION:

A. The OR STAT lab offers the following tests: arterial blood gas (ABG OR Panel-POC), Activated Clotting Time (ACT), and finger stick whole blood glucose.

B. All orders must be marked appropriately on the test requisition form and include the patient's full name, full social security number, location, date/time of collection, initials of collector, and the ordering physician.

Paper Copies are not Document Controlled

C. The OR STAT lab facilitates all testing for the operating rooms and recovery areas. Results should be available within 15 minutes from the time the sample was received in the lab.

D. All specimens must be properly collected and labeled, and delivered immediately. Lab specimens are delivered to the lab by route of the dumbwaiter in the frozen section room (5B-410). The laboratory must be promptly notified (ext. 76043) that an OR sample is in transit.

E. Specimens in II. A will be processed by Anesthesia. For those specimens sent to the CSI Unit, testing will be performed immediately upon arrival in the laboratory. The results will be phoned to the corresponding OR number written on the test requisition sheet and all results will be entered into VistA.

III. SPECIMEN COLLECTION:

A. ABG OR Panel-POC: Performed on arterial whole blood collected in a safePICO **heparinized** syringe and mixed immediately after collection and before analysis. Test immediately. A minimum blood draw of 150 µL is required, and testing must be performed within 30 minutes of collection.

B. ACT: Performed on 0.2 mL whole blood specimen immediately after collection from flushed indwelling line or by venipuncture.

NOTE: Clotted or hemolyzed samples are not acceptable for testing.

C. Finger stick whole blood glucose: Performed on capillary, venous, or arterial blood

Paper Copies are not Document Controlled

SURGICAL PATHOLOGY

TELEPHONE: Extension: 70687

LOCATION: Clinical Addition, Room 1B-328

SUPERVISOR: Shayla Powell, MLS (ASCP)CM Extension: 70659

DIRECTOR: Bradford Barker, M.D., Extension: 70712

STAFF PATHOLOGISTS: Extension: 70684
Extension: 70325

Bradford Barker, M.D.,	Extension: 70712
Ellen Araj, M.D.,	Extension: 70697
Toby Gray, M.D.,	Extension: 70721
Shelby D. Melton, M.D.,	Extension: 70726
Mariam Mir, M.D.	Extension: 70578
Daniel R. Nussenzveig, M.D., PhD.,	Extension: 71269
Roshan Patel, M.D.	Extension: 70325
Megan Wachsmann, M.D.	Extension: 70724

PATHOLOGISTS' ASSISTANT:

ON CALL/FROZEN SECTION PAGER: 214-759-3341

TRANSCRIPTION SUPERVISOR: Andreanna Taylor Extension: 70692

Paper Copies are not Document Controlled

I. GENERAL INFORMATION:

A. The American Hospital Association Handbook states ″all tissues removed at operation shall be the property of the hospital and shall be sent to the hospital pathologist, who shall make such examinations as he may consider necessary to arrive at a pathological diagnosis." Therefore, all tissues are to be sent to Pathology & Laboratory Medicine Service (P&LMS) for examination and disposal, regardless of an individual patient's wishes. Enucleated eyes, and muscle and nerve biopsies must be sent to the laboratory prior to being forwarded to UT Southwestern Medical School for preparation and examination.

B. It is the policy of the Medical Center and P&LMS that outside pathology slides be formally reviewed by one of our pathologists for any patient referred for treatment, including possible surgery, chemotherapy, or radiation therapy based on a pathology diagnosis made outside our Medical Center.

II. HANDLING OF SPECIMENS FROM WARDS AND CLINICS:

A. Upon removal, tissue should be placed immediately in a bottle of 10% formalin (provided by SCMS) and sent promptly to the Histopathology Laboratory with a completed "Tissue Examination Request", SF-515. Each container should be labeled with the ward number or clinic name, patient's full name, complete social security number, specimen type and site (including laterality), date, and time collected. Separate containers should be used when tissue is removed from more than one source, each labeled as above. If cultures are needed, they should be collected before the specimen leaves the sterile field and is placed in formalin. Specimens for culture should be submitted to the Microbiology section of the laboratory. SURGICAL SPECIMENS CANNOT BE ACCEPTED WITHOUT A COMPLETE LABEL AND A COMPLETED "TISSUE EXAMINATION REQUEST" SF-515.

B. Do not use cytology containers for surgical or biopsy specimens. The cytology cups marked "Saccomanno Collection Fluid" contain alcohol, not formalin.

C. Specimens are accessioned into the hospital computer system and surgical pathology reports are

available through this system.

D. Specimens received prior to 2:30 p.m. will be processed the same day and microscopic slides will generally be available for study the following workday. Generally, the final report is available via computer late in the afternoon. All new diagnoses of malignancy are called by the pathologist to the ordering physician.

III. HANDLING OF OPERATING ROOM SPECIMENS:

A. **Location**: Frozen Section Room, 5B-410, Extension: 71837, on-call pager 214-759-3341

B. **Hours**: Monday through Friday, 8:00 a.m. to 3:30 p.m., (holidays excluded).

C. **Specimen Handling:**

1. All biopsy specimens except for lymph nodes, breast biopsies, frozen section specimens, nerve and muscle biopsies, and specimens for electron microscopy (see following sections) removed in the operating rooms should be placed in a container of 10% formalin fixative immediately. Formalin containers are obtained from the Frozen Section Room in the OR, or from SCMS located in the basement of Building 2J.

2. Each container should be labeled with the OR number, patient's full name, complete social security number, specimen type and site (including laterality), date, and time collected. Separate containers should be used when tissue is removed from more than one source, each labeled as above.

3. <u>COMPLETE A "TISSUE EXAMINATION REQUEST", SF-515, INCLUDING AN ABSTRACT OF THE HISTORY AND OPERATIVE FINDINGS, AND ATTACH THE REQUEST TO THE CONTAINER. SUBMIT THEM TOGETHER IN A BIOHAZARD SPECIMEN BAG.</u>

4. Large specimens, (gallbladder, appendix, etc.) should be placed in an appropriately sized container with at least twice the volume of formalin as compared to the specimen size. Large specimen containers and formalin fixative containers are kept in the frozen section area of the operating room.

5. The surgical specimens are placed in the dumbwaiter and sent to the Histology section.

6. For very large specimens (colons, stomachs, lung resections, etc.), except amputations (see below), please page the pathology resident at 214 - 759-3341 so the specimen can be picked up fresh.

7. After hours, all specimens should be placed in formalin, except amputations or those requiring special handling such as lymph nodes, breast biopsies, heart biopsies, etc. Questions regarding special handling can be answered by the pathology resident on call (214-759-3341).

IV. INTRAOPERATIVE GROSS & FROZEN SECTION CONSULTATION:

A. Gross and frozen section consultations should be requested only when there is need for an immediate surgical therapeutic decision which will be based on the frozen section result or gross intraoperative consult. Curiosity alone is not sufficient justification for a frozen section.

B. When the tissue is removed and available, notify the surgical pathology resident that a gross or frozen section consultation is needed (Frozen Section and On-Call pager: 214-759-3341).

C. Place the specimen on saline moistened Telfa in a properly labeled container and place in the frozen section room along with a completed "Tissue Examination Request", SF-515. The pathologist should be provided verbally with a brief clinical history when the specimen is

Paper Copies are not Document Controlled

delivered.

D. After examination, the pathologist will give a verbal report directly to the surgeon in charge of the case. A written report is also incorporated into the final surgical pathology report. A written list is temporarily kept in the frozen section room. The list is collected at the end of the day and brought down to the Histology section and kept in a secure, locked cabinet.

E. If a gross or frozen section consultation is needed at night or on weekends or holidays, the pathology resident on call should be notified one and one-half hours before the consultation is needed in order to allow travel time to the hospital (214-857-3341).

V. AMPUTATION SPECIMENS:

A. Wrap the amputated extremity in an appropriate waterproof bag or wrapping. Label the outside of the bag with the same information as for any surgical specimen.

B. Complete a "Tissue Examination Request" Form (SF-515). Enter the specimen in the tissue record book in the operating room office and initial the column indicating that the limb has been removed from the operating room if it is to be taken to the morgue.

C. The specimen may be placed in the dumbwaiter with the other specimens, if it is before 3:30 p.m. on a regular workday.

D. After hours and on weekends and holidays, the limb should be taken to the morgue in the basement of the Clinical Addition, room BB-409, and placed in the walk-in refrigerator on the blue cart provided for such specimens. Place the SF-515 on the dumbwaiter with a note stating that the specimen is in the morgue.

VI. SPECIAL PROCEDURES:

A. ELECTRON MICROSCOPY:

Assistance with specimen collection and preservation can be obtained by calling the Histopathology Laboratory at extension 70687.

B. MUSCLE / NERVE BIOPSIES:

Please notify the histopathology laboratory at extension 70687 at least two working days before the muscle/nerve biopsy. The fixative, instruments, and an instruction sheet can be obtained on the day of the procedure from the histology section of the laboratory. Return the biopsy to the laboratory ASAP so that it may be sent to the Neuropathology Laboratory at UT Southwestern Medical Center. Please schedule the biopsy in the early morning to allow time for courier transportation and delivery to the Neuropathology Laboratory by 1:00 p.m.

C. RENAL BIOPSIES:

Please notify the histology laboratory at extension 70687 the day before the scheduled biopsy. The pathologist/resident will examine the specimen to determine whether adequate material has been obtained for examination and may request additional material if necessary.

D. LYMPH NODE BIOPSIES:

All lymph node biopsies require special handling. Lymph nodes should be delivered fresh to the frozen section room of the operating room. The pathology resident should be contacted at that time to properly triage the specimen. Please call the Frozen Section / On Call Resident pager: 214-759-3341.

E. BREAST BIOPSIES:

Paper Copies are not Document Controlled

All breast biopsies, including those removed via needle localization, require special handling andthus, should be delivered to the frozen section room of the operating room. The preoperative mammogram and specimen radiograph from needle localization procedures must accompany the specimen. The specimen must not be removed from the radiograph grid. The pathology resident should be contacted to properly handle the specimen via the Frozen Section / On Call Resident pager: 214-759-3341.

Paper Copies are not Document Controlled

TOXICOLOGY

TELEPHONE: EXTENSION: 70674

LOCATION: Room 2C-403, 2nd Floor, Building 2

DIRECTOR: Ellen Araj, M.D., Extension: 70697

TECHNICAL DIRECTOR: Dwain Fuller, F-ABFT, Extension: 70690

SUPERVISOR: Whitney Kebenzikato, MT(ASCP), Extension:70674, Pager: 214-759-3092

Drug screening and alcohol testing are available both for routine and emergency use. Routine testing is performed in Toxicology (ext. 70654) at the Dallas VAMC and in Pathology and Laboratory Medicine Service at Sam Rayburn Memorial Center (ext. 36486) in Bonham. After hours emergency testing is performed in Chemistry (ext. 70666) at the Dallas VAMC.

All tests are ordered in CPRS. All Medical Emergency specimens are delivered to Client Services Unit (CSU), room 1B-311, of P&LMS. Routine specimens are also delivered to CSU but may be delivered to the Toxicology laboratory during normal hours of operation (8:00 a.m. to 4:00 p.m.).

Paper Copies are not Document Controlled

I. ROUTINE URINE DRUG TESTING PERFORMED IN TOXICOLOGY:

A. The **Drugs of Abuse Screen** (Urine Drug Screen, DAU Screen) includes qualitative immunoassays for:

Amphetamines	**Cocaine**
Barbiturates	**Methadone**
Benzodiazepines	**Opiates**
Phencyclidine (PCP)	
Cannabinoids (THC)	

B. **Ethanol (urine), Buprenorphine, Cotinine**, **Methadone Metabolite (EDDP), Oxycodone/Oxymorphone, and Fentanyl** are also available as routine screening procedures.

C. Other assays are available by contacting the Toxicology supervisor.

D. The Urine Adulteration Panel is also available for suspect samples and presently includes testing for creatinine, pH, and specific gravity. This panel is used when a urine sample is suspected to be diluted or adulterated. Contact the Toxicology Supervisor, Director, or Technical Director for consultation.

E. Drugs of Abuse Screens and urine ethanol assays are usually completed within one working day (8:00 a.m. – 4:00 p.m.), and reported in CPRS for specimens received before 3:00 p.m. each day. Specimens delivered after 3:30 p.m. will be completed the next workday. Specimens collected on the weekend and holiday will be done on Monday morning.

F. Routine drug screens are subject to selective confirmation testing by mass spectrometry. Results held for confirmation are listed as pending until complete. Confirmation testing, performed in-house, may take up to three working days, depending on drugs identified. Confirmation testing may be requested by any clinical staff member.

G. At least 30 mL of urine is required for a drug screen and any required confirmation testing. The same urine specimen can be used for ethanol testing. A request for a routine urinalysis requires a separate sample.

II. MEDICAL EMERGENCY URINE DRUG TESTING:

A. Medical Emergency Urine Drug screen testing is performed in two different sections of the lab as

follows:

1. Monday through Friday, between the hours of 8:00 a.m. and 3:00 p.m., testing is performed in the Toxicology section of P&LMS.

2. During off shift hours (after 3:30 p.m.), weekends, and holidays, testing is performed in the Core laboratory of P&LMS. Deliver samples to P&LMS CSU, room 1B-311.

3. Medical Emergency Drug testing menu performed in the Core laboratory during off shift hours, weekends, and holidays, and an eight-assay qualitative drug screen panel is performed and consists of the following tests: Amphetamines, Barbiturates, Benzodiazepines, Cannabinoids, Cocaine, Opiates, Phencyclidine (PCP), and Tricyclics.

B. Emergency urine drug screens are available 24 hours a day, 7 days a week, are completed within one hour after receipt of a specimen, and are reported in CPRS.

C. Emergency drug screens are reported as "presumptive" positives. No confirmatory testing is performed unless requested by the physician. Any test reported as positive can be confirmed by request to the laboratory supervisor, but requires at least three working days.

D. At least 30 mL of urine is required for a drug screen and any required confirmation testing. Serum/plasma ethanol requires one, 7 mL gray top tube.

E. Emergency drug screens of blood or gastric fluid are referral tests. A minimum of 10 mL of serum or gastric fluid is required for testing to be performed. The sample must be delivered to Client Services as soon as possible.

III. ROUTINE URINE DRUG TESTIN PERFORMED AT P&LMS SAM RAYBURN MEDICAL CENTER IN BONHAM

A. The name of the Drugs of Abuse Screen Panel is “BON DAU” and it includes qualitative immunoassays for: Amphetamines, Barbiturates, Benzodiazepines, Cannabinoids (THC), Cocaine, Methadone, Opiates and Phencyclidine (PCP), and Ethanol.

B. Buprenorphine, Methadone Metabolite (EDDP) and Oxycodone/Oxymorphone are also available as screen tests but the sample must be sent to Dallas VAMC for testing.

C. At least 30 mL of urine is required for a drug screen and any other testing. A request for a confirmation test is made by calling the P&LMS (ext. 36486). The original sample will be sent by courier to Dallas VAMC.

SPECIMEN HANDLING:

A. Urine specimens submitted for drug screening must be labeled with patient’s name, complete social security number, lab order number, date of collection (not order date), time of collection, and collector's initials.

B. Unlabeled patient samples will not be accepted. The potential harm to the patient overrides any inconvenience to the collector who fails to adhere to a defined specimen collection protocol. The lab will make an attempt to notify the collector, if known, that the sample is being discarded.

C. After collection, the urine should be stored refrigerated until transportation to Pathology & Laboratory Medicine Service.

IV. OTHER INFORMATION:

A. All specimens are retained for 15 days to allow for confirmation and follow-up testing.

Paper Copies are not Document Controlled

B. Specimens other than urine for non-emergency testing, and specimens requiring other assays, are handled on a case-by-case basis. Contact the Toxicology Supervisor, Director, or Technical Director for consultation.

Paper Copies are not Document Controlled

URINE DRUG ASSAY MEDICAL CUT-OFF CONCENTRATIONS

ANALYTE	SCREEN (ng/mL)	CONFIRMATION (ng/mL)
Amphetamines Screen:	1000	
Amphetamine GC/MS, Medical		100
Methamphetamine GC/MS, Medical		100
MDA GC/MS, Medical		100
MDMA GC/MS, Medical		100
Barbiturates Screen:	200	
Benzodiazepines Screen:	200	
7-Amino Clonazepam		50
Alpha-hydroxyalprazolam		50
Nordiazepam		50
Lorazepam		50
Oxazepam		50
Temazepam		50
Buprenorphine:	10	5
Cannabinoids Screen:	50	
Cannabinoid GC/MS, Medical		5
Cocaine Screen:	300	
Cocaine Metabolite GC/MS, Medical		50
Ethanol Screen (Urine):	25 mg/dL	
Fentanyl Screen:	100	1
Methadone Screen:	300	
Opiates Screen:	300	
Codeine GC/MS, Medical		100
Morphine GC/MS, Medical		100
Hydrocodone GC/MS, Medical		100
Hydromorphone GC/MS, Medical		100
Oxycodone/Oxymorphone Screen	100	
Phencyclidine Screen	25	
Phencyclidine GC/MS, Medical		5
Cotinine Screen	500	

OTHER TESTS AVAILABLE UPON REQUEST

ANALYTE	SCREEN (ng/mL)	CONFIRMATION (ng/mL)
Ethylglucuronide	N/A	250
Ethyl Sulfate	N/A	100
Fentanyl	100	1
7-Amino Clonazepam	N/A	50
Meperidine GC/MS, Medical	N/A	100
Pentazocine GC/MS	N/A	300
Steroids, Anabolic	N/A	10
Sufentanil	N/A	1

Paper Copies are not Document Controlled

ARTERIAL BLOOD GAS LABS

TELEPHONE: Extension: 71508

LOCATION: Room 5C110, 5th Floor, Building 2

DIRECTOR: W. Claibe Yarbrough, M.D. Extension: 70405
Pager: 214-759-1701

CHIEF RESPIRATORY THERAPIST: Derrick Gillians, MSIS, BSRT, RRT/RCP Extension: 71607
Cell: 737-864-5406

SUPERVISORS:	AM Shift	Paul Collier, RRT/RCP	CELL: 214-395-5366
		Helen Tesfaselase, RRT/RCP	CELL: 469-879-4212
		Delbert, Picket, RRT/RCP	CELL: 501-747-0765
	PM Shift	Arthur Breedlove, RRT/RCP	CELL: 972-974-8644
		James Ward, RRT/RCP	CELL: 972-302-5403

ABG Coordinator: Sharelene Edwards, RRT/RCP Extension: 70565
CELL: 469-833-5646

GENERAL INFORMATION:

I. The Respiratory Therapy Unit has a total of 4 blood gas labs that perform blood gas testing (refer to the alphabetical test listing in the yellow pages of this manual for tests included in this panel): TICU/SICU, Emergency Department, MICU/CCU, and Pulmonary Function. The staffing for each lab consists or respiratory therapists and pulmonary function technologists.

II. An authorized caregiver order is required for blood gas analysis. Respiratory therapists will draw and analyze arterial blood gases for the areas that they are assigned. Licensed, credentialed respiratory therapists, critical care nurses, or rarely physicians will draw blood gases in non-OR areas. Any analyte that is in the critical range will be reported to the physician at once. All blood gas analyzers are interfaced with VistA/CPRS. As soon as blood gases are verified, the results are available for viewing in VistA/CPRS and ESSENTRIS in all ICU′s.

III. Respiratory therapist assignments for each shift are entered into VistA with the therapist pager number as well as their assigned areas and can be found on the CALL ROSTER/Respiratory Therapy section of the intranet. If the roster fails to print, call extension 71508 to request an arterial blood gas.

IV. Arterial blood gas instruments are very sensitive and ranges are set for human blood only. No other body fluids will be analyzed.

Paper Copies are not Controlled Document

FT. WORTH OUTPATIENT CLINIC

TELEPHONE: COMMERCIAL: (817) 730-0347

LOCATION: 2201 SE Loop 820, Ft. Worth, TX 76119

CHIEF: Shelby Melton, M.D., Chief, Extension: 70684

SUPERVISOR: Walter Emholtz, MT(ASCP), 817-730-0074

GENERAL INFORMATION:

I. LOCATION:

The entrance to the laboratory is located at the far southwest corner of the clinic building, on the first floor. The patient blood collection room is adjacent to the laboratory waiting room.

II. HOURS OF OPERATION:

The laboratory is staffed 5 days/week, Monday through Friday . Monday through Friday routine on-site testing is discontinued at 4:00 p.m. Chemistry specimens collected after 4:00 p.m. are transported to the Dallas laboratory for testing. All samples collected on Saturdays are transported to the Dallas laboratory for testing.

Collection hours:
Monday-Friday- 7:00 a.m. to 4:15 p.m.

III. SCOPE OF CARE:

A. Patient Served: - All outpatients requiring laboratory service.

B. Patient Services Delivered: The following tests are performed in-house. All other tests not listed below are sent to the main clinical laboratory at the VA Medical Center, 4500 S. Lancaster Rd., Dallas, TX 75216. Couriers pick up patient samples at least twice daily and deliver them to the clinical laboratory in Dallas within 2 hours of pickup.

1. **Chemistry: (Chemistries on urine or body fluids are sent to the Dallas VA for testing, with the exception of routine urinalysis, Creatinine and microalbumin).**

a. Panels:

Comprehensive Metabolic Profile	Basic Metabolic Panel
Hepatic Panel	Lipid Panel
Electrolyte Panel	Iron Saturation Panel

b. Individual Tests:

Albumin	
Alkaline Phosphatase	HDL
ALT/SGPT	Iron
Ammonia	
Amylase	LDH
AST/SGOT	Lipase
Bilirubin, Direct	Magnesium
Bilirubin, Total	Microalbumin
BNP	Myoglobin
Calcium	Phenytoin
Cholesterol	Phosphorus
CK	Potassium
CK-MB	Protein, Total
C-Reactive Protein	Transferrin
Creatinine	Triglyceride

Paper Copies are not Document Controlled

Digoxin
Gamma-GTP
Glucose
Troponin-I
Urea Nitrogen
Uric Acid

2. **Hematology:**

   a. CBC –includes:
      HGB
      HCT
      WBC
      RBC
      Indices
      Platelets
      5-part automated differential (Microscopic differential is performed routinely if count meets criteria for abnormality)

   b. Erythrocyte Sedimentation Rate (ESR)

   c. Reticulocyte count

3. **Coagulation:**

   PT (Prothrombin Time)

4. **Urinalysis:**

   Urinalysis with microscopic

5. **Immunology:**

   a. SARS-COV-2 single test,
   b. SARS-COV-2/FLU/RSV Panel

   c. Qualitative HCG, serum or urine

6. **Special Chemistry:**

   Individual Tests:
   Free T4
   Ferritin
   Folate
   Hemoglobin A1c
   TSH
   PSA, Total
   Vitamin B12
   Vitamin D, 25-OH Total

C. ANCILLARY TESTING:

1. Finger stick Glucose – Waived

2. KOH - Provider Performed Testing

3. iSTAT Creatinine - Waived

4. BinxNow Covid-19 Antigen Test- Waived

IV. PATIENT LABORATORY TEST ORDERS:

Paper Copies are not Document Controlled

Clinic personnel place all laboratory test orders in the computer using CPRS. Only Anatomic Pathology tests still require paper requisitions. When the patient arrives at the Lab reception desk, personnel accession appropriate tests using the Veteran's Identification Card (VIC), and sample labels are printed. All sample collections in this area must be ordered through VistA using "Send Patient" option.

NOTE: UNCLEAR ORDERS. Test orders that may be unclear (non-standard, non-specific terminology, etc.), must be clarified prior to continuation of testing by contacting the provider or other health care professional who placed the order. Specimens will be processed to maintain sample integrity if there is a delay in clarification of test orders.

V. ANATOMIC PATHOLOGY ORDERS:

Refer to the "Surgical Pathology" section for specific instructions.

VI. SPECIMEN TESTING PRIORITY AND GENERAL INFORMATION:

Stat results will be available within one hour of receipt.
Routine results for most tests will be available within 2-8 hours of receipt. Refer to the "General Information" section at the front of this manual for specific information regarding the following topics: critical values, reporting of results, protocol for referral testing, adding tests to an existing order, specimen collection and labeling, paper requisitions, sample acceptability/rejection criteria, accessing laboratory data in CPRS and computer downtime protocol.

Paper Copies are not Document Controlled

SAM RAYBURN MEMORIAL VETERANS CENTER
BONHAM, TEXAS

TELEPHONE: FTS: 36486, COMMERCIAL: 903-583-6486

LOCATION: 1201 East 9th Street, Bonham, TX 75418.

CHIEF: Shelby D. Melton, M.D., Extension: 70726

SUPERVISOR: Taja Colbert MLS (ASCP)^{CM}, Extension: 36269

GENERAL INFORMATION:

I. LOCATION:

The entrance to the laboratory is via the main building (Bldg. 1), 2nd floor. The patient blood collection room is Room 220.

II. HOURS OF OPERATION:

Laboratory services are available seven days/week, 24 hours/day.

Collection hours:
- Monday – Friday, 7:00 a.m. to 4:00 p.m

Testing hours:
- Monday – Friday, 7:00 a.m. to 5:00 p.m.
  - On-site testing is discontinued daily at 4:30 p.m. and held for next business day
- Monday – Friday, 5:00 p.m. to 7:00 a.m. – Texoma Medical Center-Bonham (TMC-B) lab coverage
- Friday (after 5:00 p.m.), Saturday, Sunday to Monday 7:00 a.m. – Texoma Medical Center-Bonham lab coverage
- Holidays –Texoma Medical Center-Bonham lab coverage

III. SCOPE OF CARE:

A. Patients Served -- Laboratory testing is performed for all out-patients, nursing home care unit patients, domiciliary patients, employees, and others, including those enrolled in Tri-Care and Champ VA as ordered by VA physicians/caregivers.

B. Patient Services Delivered -- The following tests are performed in-house on urine, whole blood, serum or plasma samples. Chemistry tests on urine or other body fluids are sent to the Dallas VA laboratory for testing. All tissue samples are sent to Dallas VA P&LMS for processing and diagnosis.

1. CHEMISTRY:

a. Panels: Basic Metabolic Comprehensive Metabolic
Lipid Profile Hepatic Panel
Electrolyte Panel 2-hr post-prandial glucose
DAU

b. Individual Tests:

Albumin	HDL
Alkaline Phosphatase	Iron
ALT/SGPT	LDH
Amylase	Lipase
Ammonia	Magnesium
AST/SGOT	PO4

Paper Copies are not Document Controlled

Bilirubin, Direct
Bilirubin, Total
BNP
Calcium
Cholesterol
CK
Creatinine
Gamma-GTP
Glucose
2 hr. Glucose, Postprandial (GPP)
Potassium
Pregnancy Test
Protein, Total
Triglyceride
Troponin I
Urea Nitrogen
Uric Acid
ETOH (plasma and urine)

Amphetamines Screen
Cocaine Screen
Opiates Screen
Cannabinoids Screen
PCP Screen
Barbiturates Screen
Benzodiazepines Screen
Methadone Screen

2. HEMATOLOGY:

a. CBC – includes:
HGB
HCT
WBC
RBC
Indices
Platelets
5-part automated differential (Microscopic differential is performed routinely if count meets criteria for abnormality)

b. Erythrocyte Sedimentation Rate (ESR)

3. COAGULATION:

PT (Prothrombin Time) with INR

4. URINALYSIS:

Urinalysis (Microscopic examination is performed routinely when indicated)

5. MICROBIOLOGY:

All microbiology samples are sent to the VA Medical Center Laboratory, Dallas, for testing.

6. SURGICAL PATHOLOGY / CYTOLOGY:

All specimens are sent to the VA Medical Center Laboratory, Dallas, for testing.

7. REFERRAL TESTING:

For tests ordered by VA physicians that are not performed in-house, specimens are collected/processed in Bonham and sent to the Dallas VA Medical Center Laboratory the same day of collection or the following workday. The Dallas VA Laboratory either performs the testing or sends the samples out to an approved reference lab for testing.

EMERGENCY testing after regular laboratory hours and on weekends/holidays is provided by Texoma Medical Center-Bonham. See Texoma Medical Center-Bonham policy, Proquis, BON-TECHNICAL.0245, for instructions and tests available.

Paper Copies are not Document Controlled

8. **ANCILLARY TESTING:**

   a. Finger stick whole blood Glucose-Waived
   b. KOH-Provider Performed Testing
   c. BinaxNow Covid-19 Ag Card (Domiciliary Only)

9. **Special Chemistry:**

   Individual Tests:
   Free T4
   Ferritin
   Folate
   Hemoglobin A1c
   TSH
   PSA, Total
   Vitamin B12
   Vitamin D, 25-OH Total

10. **Immunology:**

   a. Rapid influenza screening test
   b. Qualitative HCG, serum or urine

IV. PATIENT ORDERS / SPECIMEN TEST REQUESTS:

A. All lab tests for outpatients are ordered in the computer. Outpatients with and without scheduled lab appointments come directly to the lab for processing. Lab personnel accession appropriate tests using the "HOWDY" system and the Veteran's identification card.

B. Physician Order Entry of lab orders is used in the Domiciliary and the Nursing Home Care Unit. Domiciliary patients come directly to the lab and are handled as described above for outpatients.

NOTE: Add-on tests (requested after the specimen has been drawn and accessioned) require a computer order entry before the test will be performed.

NOTE: UNCLEAR ORDERS. Test orders that may be unclear (non-standard, non-specific terminology, etc.), must be clarified prior to continuation of testing by contacting the provider or other health care professional who placed the order. Specimens will be processed to maintain sample integrity if there is a delay in clarification of test orders.

V. SPECIMEN/TESTING PRIORITY:

A. ROUTINE: Results for most tests performed in house will be available within 2-8 hours from time of receipt.

B. STAT: Results will be available within two hour.

VI. Refer to the appropriate section of the Laboratory Service-General Information in the front of this manual for the following, criteria for specimen rejection, specimen acceptability/rejection criteria, reporting results, and laboratory critical values.

Paper Copies are not Document Controlled