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***Overview***

Welcome to the “Joint Directory of Services” for University of Maryland/Upper Chesapeake Health (UM/UCH). This edition was produced in conjunction with Quest Diagnostics, which is the reference laboratory utilized for testing that is not performed in-house. Our intention is to provide you, our customers, with a detailed service guide to assist with the pre-analytical, analytical, and post-analytical aspects of laboratory medicine.

This directory is designed to provide easy access to pertinent information for each section of the laboratory. It is divided into three major sections. The first section is a general information section which defines the laboratory’s procedures and protocols for the pre-analytical and post-analytical analysis. The second section is an alphabetical test listing, which defines the test options performed within each laboratory section or at Quest Diagnostics laboratories. The third section is a special instructional section, which includes information regarding specific tests listed in the alphabetical test listing.

Once again, this Joint Directory of Services was designed for you. We encourage your feedback and suggestions for subsequent editions. We are committed to providing you with accurate, reliable, patient-focused laboratory services.

Sincerely,

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Chairman, Department of Pathology Associate Pathologist

University of Maryland/ University of Maryland/

Upper Chesapeake Health Upper Chesapeake Health

Amalia E. Seiguer, MD Diane Stevens

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**POC Coordinator**

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Upper Chesapeake Health is equipped and staffed to perform routine clinical and anatomical laboratory tests as well as some specialized tests. For procedures requiring means beyond capabilities of the laboratory, properly collected specimens will be referred to an outside reference laboratory accredited by the College of American Pathologist and approved by the Chairman of the Department of Pathology and Medical Staff.

**Clinical Laboratories**

Clinical Laboratories are in operation 7 days per week, 24 hours per day. Full coverage exists Monday through Friday, 7 a.m. to 3 p.m., and limited coverage between the hours of 3 p.m. and 7 a.m. Staffing levels and availability of certain tests are diminished during limited coverage periods.

**Licensure and Accreditation**

The laboratory is certified by the Center for Medicare Services (CMS) under the Clinical Laboratory Improvement Amendment of 1988 (CLIA ’88), licensed by the State of Maryland, and accredited by the Joint Commission (TJC) and the College of American Pathologists (CAP). In addition, the Blood Bank is accredited by the American Association of Blood Banks (AABB) and is FDA inspected.

**Anticoagulation Services Clinic – University of Maryland/Upper Chesapeake Medical Center (UM/UCMC) and University of Maryalnd/Harford Memorial Hospital (UM/HMH) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

On-site point of care PT/INR testing for the purpose of managing and ensuring high quality care to patients who are prescribed oral anticoagulation (ie, Coumadin, Warfarin), is provided at each hospital. The hours of operation are:

* UM/UCMC:Monday and Wednesday 7 a.m. to 6 p.m.

 Tuesday, Thursday & Friday 7 a.m. to 3:30 p.m.

* UM/HMH: Monday, Thursday,& Friday 7 a.m. to 3pm

 Tuesday 10 a.m. to 6 p.m.

 Wednesday 8 a.m. to 4 p.m.

This patient-focused service provides extensive patient education and consultation during face-to-face encounters with the clinical pharmacist.

The referring physician must complete the appropriate Anticoagulation Referral Form which can be obtained by contacting the Anticoagulation Services Clinic (443-643-2270 – UM/UCMC/443-843-5570 – UM/HMH). After referral has been received, Anticoagulation Services will contact the patient to schedule an appointment. After the initial visit, appointments can be scheduled by telephone or a visit.

**Cytology/Histopathology and Pathology**

Laboratory hours are as follows:

* Cytology/Histology (UM/UCMC): Monday through Friday, 7 a.m. to 5 p.m. There is partial coverage on Saturday for rush cases.
* Histology (UM/Harford Memorial Hospital [HMH]): As needed
* Pathology Office: Monday through Friday, 8 a.m. to 4:30 p.m. There is partial coverage on Saturday for rush cases.

There is a pathologist on-call at all times to cover Surgical and Clinical Pathology, as well as operating room consultation, such as frozen sections. The pathologist on-call can be reached by contacting the laboratory.

**Outpatient Services – UM/HMH**

Phlebotomy services are provided in the laboratory, located near the Security Office on the main floor of the hospital. The Phlebotomy Department operates 24 hours per day, 7 days per week.

Requests for outpatient services must be in writing from the attending physician. A verbal order by telephone or otherwise must be followed with a written order. ICD-10 codes must also be included with the written order. Glucose tolerance testing, bone marrow biopsies, and therapeutic phlebotomies must be scheduled through Centralized Scheduled (443-843-7000). Renal and muscle biopsies for special studies must be scheduled 24 hours in advance.

**Outpatient Services – UM/UCMC**

Phlebotomy services are provided on the Garden level of the Ambulatory Care Center. Hours of operation are Monday through Friday, 6:30 a.m. to 6 p.m. and Saturday, 8 a.m. to 12 p.m.

Requests for outpatient services must be in writing from the attending physician. A verbal order by telephone or otherwise must be followed with a written order. ICD-10 codes must also be included with written order. Glucose tolerance testing, bone marrow biopsies, fertility studies, and therapeutic phlebotomies must be scheduled through Centralized Scheduling (443-843-7000). Renal and muscle biopsies for special studies must be scheduled 24 hours in advance.

**Animal Specimens**
Animal specimens are generally not acceptable for laboratory testing and will not be tested. Human Specimen Acceptability Requests for uncommon specimen type testing will be rejected, and the order cancelled, unless validation information is available.

**Cancellation of Tests**

Tests may be cancelled without charge while specimens are in transit. A nominal fee will be charged for cancellations after specimens have been accessioned but not yet assayed. For cancellation requests, please call Client Services.

**Confidentiality of Results**

Quest Diagnostics is committed to protecting the confidentiality of individuals’ private laboratory test results and other personal information in compliance with all applicable federal, state, and local laws and regulations. For more information about our privacy practices, please visit our website at [www.QuestDiagnostics.com](http://www.QuestDiagnostics.com) or send a message to: privacy@QuestDiagnostics.com or write to: Data Privacy and Security Officer, Quest Diagnostics, 1290 Wall Street West, Lyndhurst, NJ 07071.

**Infectious Substances**

In 2006, the U.S. Department of Transportation (DOT) changed the rules for classifying specimens for transport, consistent with the International Air Transport Association (IATA) rules that had previously been changed. Under the new rules most specimens for clinical testing may be classified as either “exempt” specimens or “biological substance, category B-UN3373” specimens, however, classifying and packaging routine specimens for testing as biological substance, category B ensures that appropriate packaging and precautions are taken. Only certain specimens with a higher potential to transmit severe, disabling or fatal disease must be declared and packaged as “Infectious Substance, Category A-UN2814”. Those needing to transport infectious substances should check with the DOT, the U.S. Centers for Disease Control (CDC) or public health authorities to determine classification of the specimen and , correspondingly, how the specimen should be packaged for transport. For example, certain cultures must be packaged as a DOT or IATA “infectious substance.” **For courier transport:** bacterial isolates should be submitted in a screw-cap agar slant using Trypticase soy agar with or without 5% sheep blood or Chocolate agar. Fungal specimens should be submitted in a screw-cap agar slant of Sabouraud Dextrose agar. All tubes must be appropriately labeled, tightly capped and sealed with tape or parafilm. Do not submit bacterial or fungal cultures on petri dishes. Place each isolate to be transported in a separate Tape Seal 95kPa Specimen Transport Bag with absorbent material. **It is important to use a separate bag for each isolate.**

**Test Additions After Submission of Specimen**

Client Services can arrange for additional testing if the specimen is stable and the volume sufficient after initial tests have been completed. We are required by Federal regulations to request written authorization for every test we perform. Our clients will receive a request for written confirmation for verbal test requests via hard copy reporting or by telephone. The physician or authorized employee must sign and return this written confirmation.

**Reference Ranges**

Quest Diagnostics Nichols Institute establishes its own referenceranges for analytes whenever possible. Many of our pediatric ranges have been developed in conjunction with major healthcare institutions. For some procedures, it is necessary to use ranges suggested by the reagent manufacturer or reported in the literature.

**Repeat Determinations**

We will repeat a test without charge whenever, in the physician’s opinion, the result does not correlate with the patient’s clinical profile. Please call the laboratory as soon as possible after the original result is reported. When requesting a repeat determination or a new specimen, include the prior laboratory specimen number and explain the circumstances for the request on the test requisition accompanying the new specimen.

Follow up or confirmatory testing is not considered a repeat determination. These specimens will be processed and billed as new requests.

**Reporting**

Routine test result reporting times vary, depending upon the nature of the test, the analytical time required for the procedure and the method of reporting. Reports are delivered electronically, distributed by the Quest Diagnostics Logistics Team, by facsimile, or by the US Postal Service.

**Specimen Retention**

After testing is completed, samples are kept refrigerated for 21 days and then discarded. Samples that must be retained longer than 14 days are kept frozen. The retention times for all samples will vary and are based on such criteria as:

* State and federal regulations
* Test manufacturer’s recommendations
* Deterioration of the analyte
* CAP requirements and CLSI guidelines
* Acute/convalescent testing requirements
* Pending litigation

Appropriateness of testing is ultimately a technical decision and is made by the technical staff using test-specific criteria. Quest Diagnostics Nichols Institute’s Sample Storage Policy assures availability of adequate and reliable specimens. Please call Client Service for more details.

**Quality Assurance: An Overview**

As part of an extensive set of activities focused on quality, Quest Diagnostics has a formal Quality Assurance Program that monitors and evaluates the quality of the testing process (pre-analytic, analytic, and post-analytic). This Quality Assurance Program has both local and national components.

Each laboratory site carries out an extensive Quality Assurance Plan that provides for systematic monitoring of the quality and appropriateness of services. The National Quality Assurance department monitors general laboratory performance across the Quest Diagnostics network and supports the local Quality Assurance activities through laboratory inspections, tracking of proficiency testing outcomes, and other programs.

Our goal is to become the first laboratory in our industry to aspire to virtual error-free performance by embracing the principles of Six Sigma Quality, a measurable set of interrelated business objectives, based on the Voice of the Customer.

**Common Causes of Unacceptable Serum or Plasma Specimens and Inaccurate Test Results**

**Hemolysis**

Hemolysis occurs when the membrane surrounding red blood cells is disrupted and hemoglobin and other intracellular components escape into the serum or plasma. Hemolyzed serum or plasma varies in color from faint pink to bright red, rather than the normal straw color. Grossly or moderately hemolyzed specimens may be rejected and even slight hemolysis may alter certain test results.

**Hyperbilirubinemia**

Icteric serum or plasma varies in color from dark to bright yellow rather than the normal straw color. Icterus may affect certain determinations. Upon receipt of such specimens, we may request a new sample to assure results of diagnostic value.

**Turbidity (Lipemia)**

Turbid, cloudy, or milky serum (lipemic serum) may be produced by the presence of fatty substances (lipids) in the blood. Bacterial contamination may also cause cloudy serum. Moderately or grossly lipemic specimens may alter certain test results.

A recent meal may produce transient lipemia; therefore, we recommend that patients fast 12-16 hours before a blood specimen is obtained.

**Radioisotope Interference**

Diagnostic procedures or therapy involving radioactive compounds may invalidate radioisotope assays. Obtain specimens for anticipated radioisotope assays before administering isotopes to the patient.

Laboratory test results are dependent on quality of specimen submitted. It is important that all specimens and request slips be properly labeled with patient’s first and last name, date and time of collection, collector’s initials, date of birth and specimen source, when applicable.

If there is any doubt or question regarding type of specimen that should be collected, it is imperative that the laboratory be called to clarify order and specimen requirements.

**Blood Collection**  Venous or capillary blood for laboratory analyses will be drawn by authorized personnel. Laboratory personnel are not authorized to perform arterial punctures on patients or draw blood from patients with a Port-A-Cath®

Most laboratory tests are performed on anticoagulated whole blood, plasma, or serum. Please refer to individual test listings for specific requirements.

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

**Blood Collection Techniques**  Blood Culture Collection Technique *Equipment:* Disposable gloves, sterile needle, needle holder, BACTECTM culture vials (aerobic and anaerobic), tourniquet, ChlorascrubTM swabstick, gauze, and adhesive bandage or tape.

*Procedure:*

 1. Inpatient: Identify patient by comparing patient date of birth and spelling of first and last name on requisition and/or labels with patient’s armband. Armband must be physically attached to the patient when making this comparison. Patient information on patient’s armband must match patient information on requisitions and/or labels. **Note:** All discrepancies between the patient’s armband and requisition and/or labels must be resolved before specimen is drawn from patient.

Outpatient: Outpatients will be asked to verbalize first and last name and date of birth which will be compared with registration paperwork.

2. Check above bed for any “special instructions” signs. 3. Assemble all necessary equipment in a convenient location

 close to the patient. 4. Prepare venipuncture site as follows:

1. Locate vein to be used.
2. For patients > 2 months, using ChlorascrubTM swabstick, scrub skin with friction in a horizontal and vertical fashion for 30 seconds.

**Note:** Betadine® Method and Patients Under 2 Months of Age: Scrub site using an alcohol pad working outward from venipuncture site in a circular motion. After alcohol prep, scrub site using a Betadine® pad working outward from venipuncture site in a circular motion. For patients with iodine sensitivity, cleanse skin with alcohol for 60 seconds. Do a second Betadine® scrub with a fresh pad scrubbing outward from venipuncture site in a circular motion. **The Betadine® should be allowed to dry.** Do not palpate vein after second scrub. Do not wipe or blow Betadine® dry, as this will contaminate site.

1. Allow to dry for 30 seconds.
2. Do not touch or palpate area after cleansing.

5. Prepare BACTECTM culture vials.

1. Remove flip-off caps from BACTECTM culture vials.
2. Wipe top of vials with a single isopropyl alcohol wipe and allow to dry for 60 seconds. **Do not use iodine on tip of BACTECTM vial.** (Iodine will cause rubber septum to disintegrate, and sterile integrity of vial will be compromised.)

6. Draw blood

1. Apply tourniquet to patient’s arm above desired venipuncture site. **Note: Do not use regular VACUTAINER® blood collection set –** liquid media from vial may back flow into patient’s vein. Butterfly with VACUTAINER® is acceptable.
2. Insert needle into prepared vein and draw 8mL to 10mL of blood into each blood culture vial. The aerobic vial (blue-top) should be used first. **Note:** Avoid drawing blood through an indwelling intravenous or intra-arterial catheter.
3. Loosen tourniquet from patient’s arm.
4. Withdraw needle and discard into puncture resistant biohazard container.
5. Cover puncture site with gauze and apply pressure until all bleeding has stopped.
6. Apply bandage to puncture site after bleeding stops. Use paper tape for elderly patients.
7. Invert each vial 1 to 3 times.
8. Post-phlebotomy care is important. Extreme care should be used with patients on anticoagulant therapy or that are platelet deficient. These patients are prone to extended bleeding times.
9. Write collector’s initials, date and time and, site of collection (ie, right arm) on the Meditech label. Place Meditech label on vial but do not cover bar code on blood culture bottles with patient’s Meditech label. **Note: All labeling must be performed at bedside for inpatients. For outpatients, specimens must be labeled before patient leaves collection area.**
10. Deliver BACTECTM culture vials promptly to laboratory.

7. Sources of possible error are as follows:

1. Improper cleansing and disinfection of venipuncture site and rubber septum on blood culture vials may be sources of contamination leading to false-positive blood cultures.
2. Touching a previously disinfected site with anything non-sterile may be a source of contamination.
3. Overfilling bottle beyond recommended fill will result in false growth index readings on instrument resulting in a false-positive culture.
4. Reduced volume of blood will delay detection of positive blood cultures.
5. Prior to use, each vial should be examined for evidence of contamination, such as cloudiness, bulging or depressed rubber septum, or leakage. Do not use if contamination is present.

Skin Puncture Technique *Equipment:* Disposable gloves, disposable skin puncture device, microcollection tubes, 70% isopropyl alcohol wipes, gauze, and adhesive bandage or tape.

*Procedure:*

1. Inpatient: Identify patient by comparing patient date of birth and spelling of first and last name on requisition and/or labels with patient’s armband. Armband must be physically attached to the patient when making this comparison. Patient information on patient’s armband must match patient information on requisitions and/or labels.

**Note:** All discrepancies between the patient’s

armband and requisition and/or labels must

 be resolved before specimen is drawn from

 patient.

 Outpatient: Outpatients will be asked to verbalize first and last name and date of birth which will be compared with registration paperwork.

1. Check above bed for any “special instructions: signs.
2. Select appropriate microcollection tube type for test(s) ordered.
3. Assemble all necessary equipment in a convenient location close to patient.
4. Skin puncture blood can be obtained from lateral or medial plantar surface of heel, plantar surface of a big toe, or palmar surface of distal phalanx of a finger.
5. If an infant’s heel is to be punctured, site should be on plantar surface medial to a line drawn posteriorly from middle of great toe in heel or lateral to a line drawn posteriorly from between fourth and fifth toes to heel. In almost all infants, heel bone is not under these areas. Puncture should not be through a previous puncture site which may be infected, nor should it be at curvature of heel.
6. Skin punctures should not be performed on central area of an infant’s foot (area of arch). This may result in injury to nerves, tendons, and cartilage and offers no advantage over puncturing heel. Skin punctures should not be performed on fingers of infants.
7. Where skin punctures are performed on adult fingers, the following guidelines should be observed:
8. Puncture should be on palmar surface of distal phalanx and not at side of tip of finger, because tissue on side and tip of finger is about half as thick as tissue in center of finger.
9. Fifth finger should not be punctured because tissue is considerably thinner than tissue of thumb, index, middle, and ring fingers.
10. Warming skin puncture site can increase blood flow through site sevenfold. A hot pack or warm, moist towel at a temperature of no higher than 42°C may be used to cover site for at least 3 minutes.
11. The site should be cleaned with a 70% isopropyl alcohol wipe. Rubbing area vigorously with alcohol pad will increase circulation. Site must be thoroughly dried with a sterile gauze pad before being punctured because residual alcohol causes rapid hemolysis. Betadine® should not be used to clean and disinfect skin puncture sites; blood contaminated with Betadine® may have falsely elevated levels of potassium, phosphorus, or uric acid.
12. The heel or finger must be held firmly to prevent sudden movement. Wearing gloves, perform puncture with a quick jabbing motion.
13. The first drop of blood should be wiped away with a gauze pad; it is most likely to contain excess tissue fluid. Exception to this protocol may be point of care testing. Refer to specific point of care procedures for instructions.
14. If puncture is adequate, 0.5 mL of blood can be collected from a single puncture site.
15. Blood flow from puncture is enhanced by holding puncture site downward and gently applying continuous pressure to surround tissue (or proximal to puncture site when blood is obtained from a finger). Strong repetitive pressure (milking) should

not be applied; it may cause hemolysis or contamination of specimen with tissue fluid.

1. Release pressure occasionally to allow blood to flow back into puncture site.
2. Hold microcollection tube at an angle below, horizontal with vent hole in collection cap in an upward position. Let blood flow into top of collection cap. Do not scoop blood into container or hemolysis may occur. Occasional tapping will assist flow.
3. Remove collection cap and replace with stopper.
4. When blood is collected in microcollection devices containing anticoagulant (ie, EDTA or heparin), devices should be immediately stoppered and blood mixed well to prevent coagulation. These tubes must be filled with proper quantity of blood; overfilling will result in clot formation whereas under filling can cause morphologic changes in cells due to excess anticoagulant.
5. After blood has been collected from an infant’s heel, press a gauze pad against puncture site until bleeding stops.
6. Apply a BAND-AID® dot to puncture site.
7. Post-puncture care is important. Extreme care should be used with patients on anticoagulant therapy or who are platelet deficient. These patients are prone to extended bleeding times.
8. Label all vials following the “Labeling of Specimens” protocol found in “Specimen Collection and Preparation” in “General Information.” **Note: All labeling must be performed at bedside for inpatients. For outpatients, specimens must be labeled before patient leaves collection area.**
9. Dispose of skin puncture device, collection equipment etc., into appropriate puncture resistant biohazard containers.

Venipuncture Technique *Equipment:* Disposable gloves, sterile needle, needle holder, evacuated blood collection tubes, tourniquet, 70% isopropyl alcohol wipes, gauze, and adhesive bandage or tape.

*Procedure:*

1. Inpatient: Identify patient by comparing patient date of birth and spelling of first and last name on requisition and/or labels with patient’s armband. Armband must be physically attached to patient when making this comparison. Patient information on patient’s armband must match patient information on requisitions and/or labels. **Note:** All discrepancies between patient’s armband and requisition and/or labels must be resolved before specimen is drawn from patient. Outpatient: Outpatients will be asked to verbalize first and last name and date of birth which will be compared with registration paperwork.
2. Check above bed for any “special instructions” signs.
3. Select appropriate tube type for test ordered.
4. Assemble all necessary equipment in a convenient location close to patient.
5. Thread appropriate needle into holder until it is secure.
6. Close patient’s hand and select a vein site. Large median cubital and cephalic veins are used most frequently. Wrist and hand veins are also acceptable for venipuncture. Never draw a specimen from a location above an intravenous site, specimen will be contaminated and over diluted.
7. Apply tourniquet 3 to 4 inches above venipuncture site. Never leave tourniquet on for longer than 60 seconds. Localized stasis may occur with a tourniquet, together with the formation of a partial filtrate of blood and hemoconcentration. This may result in erroneously high values for all protein-based analytes, packed cell volume, and other cellular elements.
8. Cleanse venipuncture site with 70% isopropyl alcohol wipes, allowing area of dry to prevent hemolysis.
9. Anchor vein with your thumb 1 inch to 2 inches below venipuncture site.
10. Wearing gloves, remove needle cap. With bevel up, line up needle with vein. Insert needle into vein. Grasp flange of needle holder and push tube forward until butt-end of needle punctures stopper. Maintain tube below site when needle is in vein.
11. Fill tube until vacuum is exhausted and blood flow ceases.
12. Remove tube from holder and insert next tube into holder
13. If more than 1 blood collection tube is required, tubes should be drawn in following order:
14. Blood culture
15. Plain red
16. Light blue
17. Gold/SST
18. Light/dark green
19. Purple (EDTA)
20. Pink
21. Royal blue
22. Gray
23. Yellow (ACD)
24. If light blue-top tube intended for coagulation testing is to be drawn, never draw first because thromboplastin from site of venipuncture can invalidate coagulation assay results. If a light blue-top tube is only tube to be drawn, a 5-mL discard tube should be drawn first.
25. If blood collection tube contains an additive, invert gently 10 to 15 times to ensure thorough mixing.
26. After all specimens have been drawn, remove needle slowly, and place a gauze pad over site. Apply pressure to site until bleeding stops.
27. Apply a bandage to venipuncture site after bleeding stops. Use paper tape for elderly patients.
28. Label all vials following the “Labeling of Specimens” protocol found in “Specimen Collection and Preparation” in “General Information.” Do not cover bar code on blood culture bottles with patient’s bar code label. **Note: All labeling must be performed at bedside for inpatients. For outpatients, specimens must be labeled before patient leaves collection area.**
29. Post-phlebotomy care is important. Extreme care should be used with patients on anticoagulant therapy or who are platelet deficient. These patients are prone to extended bleeding times.
30. If first phlebotomy attempt is unsuccessful, it is imperative that a fresh, sterile needle (and blood collection tubes if vacuum is lost) be used before performing a second puncture.
31. Only a physician or nurse is permitted to manipulate indwelling lines for specimen procurement. To provide specimens that are satisfactory for laboratory testing, draw first 10 mL of blood; but do not send this blood to lab (it is drawn to cleanse line of medication or intravenous fluid). The next specimen can be used to chemistry, hematology, etc. The last specimen is used for coagulation studies.
32. Dispose of all needles, collection equipment etc., into puncture resistant biohazard containers as per protocol. Do not cut or break needles before discarding into containers.

**Histopathology Specimen Collection**  Specimens removed surgically from a patient should be submitted to laboratory for examination by a pathologist. Certain specimens that are specifically excluded from this requirement are approved by the Medical Executive Committee.

**Labeling of Specimens** Blood Bank Specimens Blood Bank specimens for “Crossmatch” or Type and Screen” must be labeled with a Blood Bank label. (**Unlabeled specimens are not acceptable.)** The following information must be handwritten on label:

* Patient’s first and last name
* Medical record number
* Date and time of draw
* Phlebotomist’s initials
* Patient’s date of birth

Blood Bank label is to be compared to patient’s hospital identification bracelet for accuracy, and peel-off label must

then be attached to specimen. Wristband is then to be immediately secured to patient’s wrist or ankle.

Specimens for Areas Other than Blood Bank Specimens collected by nursing or medical personnel, for tests other than compatibility testing, must be labeled with the following:

* Patient’s first and last name
* Date and time of collection
* Collector’s initials
* Specimen source (Cytology, Histology, and Microbiology specimens)
* Physician’s name (Cytology and Histology specimens)
* Patient’s date of birth

Minimally acceptable labeling (except for Blood Bank specimens) includes first and last name, date of birth, date and time of collection, and collector’s initials. Collector’s initials may be communicated verbally to laboratory team members.

**Microbiology Specimen Collection**  Laboratory personnel are not authorized to collect culture specimens from sites other than throat on outpatients.

**Specimen Collection Tubes Available**  The following is a list of tubes referred to in specimen requirements:

* *Green-Top Tube (Heparin):* This tube contains lithium or sodium heparin – used for drawing heparinized plasma or whole blood for special tests. **Note:** After tube has been filled with blood, immediately invert tube several times in order to prevent coagulation.
* *Grey-Top Tube (Potassium Oxalate/Sodium Fluoride):* This tube contains potassium oxalate as an anticoagulant and sodium fluoride as a preservative – used to preserve glucose in whole blood and for some special chemistry tests. **Note:** After tube has been filled with blood, immediately invert tube several times in order to prevent coagulation.
* *Lavender-Top Tube (EDTA):* This tube contains EDTA K2as an anticoagulant – used for most hematological procedures. **Note:** After tube has been filled with blood, immediately invert tube several times in order to prevent coagulation.
* *Light Blue-Top Tube (Sodium Citrate):* This tube contains sodium citrate as an anticoagulant – used for drawing blood for coagulation studies. **Note:** It is imperative that tube be completely filled. The ratio of blood to anticoagulant is critical for valid prothrombin time results. Immediately after draw, invert tube 6 to 10 times in order to activate anticoagulant.
* *Pink-Top Tube (K2EDTA):* This plastic tube contains K2EDTA as an anticoagulant – used for most Blood Bank procedures. **Note:** After tube has been filled with blood, immediately invert tube several times in order to prevent coagulation.
* *Red-Top Tube*: This tube is a plain VACUTAINER® containing no anticoagulant – used for drawing serum for selected chemistry tests as well as clotted blood for immunohematology.
* *Royal Blue-Top Tube*: There are 2 types of royal blue-top Monoject® tubes – 1 with the anticoagulant EDTA and the other plain. These are used in drawing whole blood or serum for trace element analysis. Refer to individual metals in individual test listings to determine tube type necessary.
* *Serum Gel Tube (Gold SST)*: This tube contains a clot activator and serum gel separator – used for various laboratory tests.
* *Special Collection Tubes:* Some tests require specific tubes for proper analysis. Please contact the laboratory at Harford Memorial Hospital or Upper Chesapeake Medical Center prior to patient draw to obtain correct tubes for metal analysis or other tests as identified in individual test listings.
* *Yellow/Red-Top Tube*: This tube contains sodium EDTA and ascorbic acid – refer to individual metals in the individual test listings.
* *Yellow-Top Tube (ACD)*: This tube contains ACD – used for drawing whole blood for special tests.

**Packaging**

The following are the minimum specimen packaging guidelines that should be followed when submitting specimens.

1. Collect the specimen and transfer to a proper transport container, if needed. Double check the specimen container to ensure that the device is not beyond its stated expiration date.
2. Ensure that all specimen container caps and lids are properly tightened to prevent leakage.
3. Fold the top copy of the site batch in half widthwise with the patient’s name and bar code facing out with barcode visible in the bottom corner of the appropriately colored coded temperature transport bag. Retain the second copy for your files.
4. Frozen specimens should be transported in plastic screw-cap containers only. Frozen specimens must be placed **in a separate specimen bag** along with **a separate test requisition. Frozen specimens cannot be split for other tests.** If more than one test is ordered on a single frozen sample, we will call you to authorize which of the tests ordered you want performed before testing can proceed.
5. Remove the protective strip and seal the specimen bag. The protective strip must not obstruct the bar code. This will protect the test requisition from leakage and help ensure that the patient information can be entered directly into the laboratory computer by scanning the bar code.
6. If the specimen has been classified as an “infectious substance,” transport in a box designated to withstand 95kPa of pressure to meet the ICOA/IATA and DOT requirements. These boxes are available from the local laboratory. Please inform Quest Diagnostics prior to, or at the time of our Logistics Representative pick-up, so that proper transport arrangements can be made.
7. Any updates to these guidelines (or to the specimen transport supplies) will be communicated through your local Quest Diagnostics sales representative or Logistics Representative.

**Holding and Securing Specimens**

While awaiting pick-up by a Quest Diagnostics Logistics Representative, maintain specimens at room temperature or in the refrigerator unless otherwise noted under the

“Transport Temperature” or other specimen requirement in this section or in the General Test Listing section.

If you would like more information about sending specimens to Quest Diagnostics, please contact your Client Services Representative. Any updates to these guidelines will be communicated through the LABORATORY UPDATE and/or by your local Quest Diagnostics Sales Representative.

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

Inadequately Labeled Specimens Criteria for rejection are as follows:

* *Improperly/Incompletely Labeled*: Patient’s first and last name, date of birth, date and time of collection, and collector’s initials are minimum acceptable patient identification data required on specimens. At some point, a medical records number must be obtained before results may be reported. Surgical specimens must also be labeled with specimen source and surgeon’s name. Microbiology specimens must include specimen source on label. Blood Bank specimens with labels having nicknames or abbreviations are unacceptable.
* *Mislabeled Specimens*: A specimen is mislabeled if patient identification differs from patient identification on requisition associated with it. Blood Bank specimens having labels with incorrect medical record number, with patient name misspelled, or with nicknames or abbreviations are unacceptable.
* *Unlabeled Specimens*: Any specimen is unlabeled if container holding specimen does not have patient’s first and last name directly affixed to it. Container itself must be labeled, not merely lid or bag in which specimen is placed. Blood Bank specimens must have Typenex® label affixed.

Optimal labeling includes:

* Patient’s first and last name
* Hospital location
* Medical record number
* Date and time of collection
* Collector’s initials
* Specimen source
* Physician’s/surgeon’s name
* Patient’s date of birth

Inadequate Requisitions Requisitions are to be used when submitting the following specimens:

* Anatomic Pathology specimen
* Cytology specimens

Requisitions should include the following information:

* Patient’s first and last name
* Date of birth
* Sex
* Race (for Anatomic Pathology only)
* Hospital location
* Medical record number (if applicable)
* Billing number
* Date and time of collection
* Collector’s initials
* Specimen source
* Ordering physician’s/surgeon’s name (if other than attending physician/surgeon)
* Requesting physician’s/surgeon’s signature (for Anatomic Pathology and Cytology specimens only)
* Test(s) requested
* Diagnosis/clinical history
* ICD-9 code (numeric)(for outpatients)
* Last menstrual period (for Anatomic Pathology and Cytology GYN specimens only)
* Time of last dose (for therapeutic drug monitoring)

Specimens Which Pose Hazardous Handling Conditions Any specimen submitted in a manner which could create a health or safety hazard to laboratory personnel is considered unacceptable. These include:

* Specimens submitted in syringes with needles intact
* Cracked or leaking containers with external contamination
* Specimens submitted in tissue paper, diapers, foil, plastic wrap, etc
* Specimens in formalin without formalin warning sticker affixed to specimen container

Unsatisfactory or Suboptimal Specimens A specimen is unsatisfactory if it is collected, handled, or transported in such a way that substances or constituents of interest cannot be accurately measured or counted in the clinical laboratory. These include:

* Specimens collected in incorrect tube, container, or preservative
* Specimens drawn above an intravenous line
* Specimens inappropriately handled with respect to temperature, timing, or storage requirements
* Quantity not sufficient
* Specimens hemolyzed or showing evidence of contamination which would interfere with testing or cause invalid test results
* Blood Bank specimens with moderate or gross hemolysis or in serum separator tubes
* Anatomical pathology or Cytology specimen not placed in proper fixative
* Microbiology specimens collected in non-sterile containers.

The presence of hemolysis, microscopic evidence of contamination, etc., make some specimens less than optimal for testing. In this case, specimen will need to be recollected or certain tests will not be performed. This will be indicated in report at completion.

**Unacceptable Specimens – Corrective Action** Improperly/Incompletely Labeled Specimens The adequacy of specimen labeling for Blood Bank will be determined by that section since it adheres to more stringent labeling rules than other laboratory sections. Guidelines for sections other than Blood Bank are that a specimen labeled only with patient’s name may be accessed in laboratory systems, and collector will be contacted to provide needed information.

Mislabeled or Unlabeled Specimens The laboratory will cancel order and will notify location where specimen originated and request a new specimen. Irreplaceable specimens may include spinal fluid, fluid aspirate, timed specimens, surgical tissue, etc. Irreplaceable specimens lacking labeling may not be accessed into laboratory system. They are to be maintained at proper temperature (ie, ambient temperature, refrigerated temperature) until collector provides positive identification. Documentation of identification process, including identification of personnel who provided positive identification of specimen, is to be entered in computer systems and recorded on the Correction of Specimen Labeling Error Form.

Inadequate Requisitions When patient’s identification or other essential information is not on requisition or a requisition was not received, a new or completed requisition from collection site will be requested.

If requisition is lacking nonessential information, specimen may be temporarily accessed and tested. The collection site will be contacted to provide needed information.

Specimens Which Pose Hazardous Handling Conditions Specimens submitted in syringes with needles attached are unacceptable. If such a specimen is received, laboratory will notify collection site and offer opportunity to come to laboratory and transfer specimen into an acceptable, labeled container.

Specimens submitted in cracked or leaking containers with external contamination or specimens submitted in tissue paper, foil, etc., that are able to be re-obtained will be cancelled, and collection site will be notified. A new specimen and new order will be requested. Specimens that cannot be re-obtained will be assessed, and collection site will be notified if corrective active is necessary. This action may include offering personnel from collection site opportunity to transfer specimen into an acceptable, labeled container.

Unsatisfactory or Suboptimal Specimens If collection, transport, or storage conditions are deemed unacceptable by laboratory personnel, ordered tests will be cancelled, collection site will be notified, and a new specimen and new order will be requested.

**Critical Results** Some results of procedures performed in the laboratory are so indicative of poor patient condition that they could be life-threatening and are deemed “critical.” Critical results are determined by the Upper Chesapeake Health Medical Executive Committee. These results are to be communicated to responsible individuals immediately. The charge nurse or the patient’s nurse (in the case of an inpatient) or the physician’s office (in case of an outpatient) is to be notified immediately of the critical results(s).

**Critical Values**

In accordance with the CAP requirement, Quest Diagnostics and UM/UCH have a mutual agreement that when Quest Diagnostics has verified a critical result from a sample referred to them by UM/UCH, they will call the UM/UCH laboratory with these results. Notification to the ordering physician, is the responsibility of the UCH laboratory.

**Distribution of Reports** Results of testing are available immediately upon test completion and verification via computer terminals located throughout the hospital. Critical values are verbally reported to the patient’s caregiver in accordance with laboratory protocol.

All results are mailed Monday through Friday to physician offices unless otherwise directed by physician. Results will be faxed to a physician’s office upon request.

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

**Medical Records**

The Medical Records Department will maintain all requests for laboratory services as part of the patient’s chart. Laboratory results, for both inpatients and outpatients, are made part of the medical record. Surgical Pathology results will be retained for ten years.

Release of Medical Records­ Test results may only be released to the patient after the patient completes a “Release of Medical Information Form.”

**Reference Values**  All reference values listed on the report are for adult normals unless otherwise indicated.

**Reportable Disease**  The laboratory endeavors to comply with reporting requirements for each state health department regarding reportable disease. We report by fax, form, or phone depending upon individual state health department regulations. The laboratory reports to the appropriate state health department based upon the state listed on the client address. We strive to cooperate with our clients so that we

both comply with state regulations. If you need further information, please do not hesitate to contact the laboratory.

**Requisitions** The laboratory will only perform tests at the request of a physician or authorized individuals defined by the State of Maryland. Specific test request forms are provided free of charge by the laboratory. Essential order elements on requisition include:

* Adequate patient identification, which is the patient’s name and date of birth
* Name and address of ordering physician so that test results will be forwarded to that physician correctly.
* Must list tests or assays requested.
* Date and time of specimen collection, where the physician has deemed it as necessary.
* ICD-9 code(s) for Medicare patients. Non-Medicare patient requisitions must include a narrative diagnosis or signs/symptoms for the patient.

Additional clinical information is required on some of these forms for diagnostic reasons. Please complete all information requested for help in interpreting results. Fill in the test that is requested. All outpatient requisitions require a physician’s signature.

**UCH LAB CRITICAL VALUE NOTIFICATION LIST**

**CHEMISTRY**

|  |
| --- |
|  **STANDARD CRITICAL VALUES** |
| TEST | LOW | **HIGH** |
| Bilirubin, Neonatal | Call All | Call All |
| Calcium | **<**7 mg/dL | **>**12 mg/dL |
| Carbon Dioxide | **<**15 mmol/L | >40 mmol/L |
| Chloride | <80 mmol/L | >115 mmol/L |
| Creatinine | **-** | >10 mg/dL |
| CSF | Call All Inpatient and ED patients | Call All Abnormal Outpatient |
| Glucose | <50 mg/dL | >400 mg/dL |
| Glucose (neonate) | <40 mg/dL | >250 mg/dL |
| Lactate | **-** | >4.0mmol/L |
| Potassium | **<**3.0 mmol/L | **>**6.5 mmol/L |
| Sodium | **<**125 mmol/L | >150 mmol/L |
| Therapeutic Drug Levels | Call All Toxic Levels | Call All Toxic Levels |
| Troponin | **-** | Initial TNI >0.5 ng/mL All patients (inpatient and ED) |
| Urea Nitrogen Blood | **-** | >100 mg/dL |
| Acetaminophen | **-** | >150 mg/mL |
| Magnesium | <1.0 mg/dL | >4.5mg/dL |
| OB Magnesium | **-** | >7.0 mg/dL |

#### HEMATOLOGY

|  |
| --- |
| STANDARD CRITICAL VALUES |
| **TEST** | LOW | **HIGH** |
| CSF | Call All | Call All |
| CSF Cell Count (>9 WBC’s) | Call Infection Control | Call Infection Control |
| Gross Abnormal Diffs | Immature Cells-Issue Preliminary, Pathologist Review to Follow | Immature Cells – Issue Preliminary, Pathologist Review to Follow |
| Hematocrit | <25 % | - |
| Hemoglobin | <8.0 g/dL | - |
| Platelet Count | <20,000 k/mm3 | >1,000,000 k/mm3 |
| WBC | <2,000 k/mm3 | >25,000 k/mm3 |

**COAGULATION**

|  |
| --- |
|  **STANDARD CRITICAL VALUES** |
| **TEST** | **NOT on Anti-Coag Therapy** |  **IS on Anti-Coag Therapy** |
| PT/INR | >20 seconds | INR of 5.0 or greater |
| PTT | >50 seconds | - |

**BLOOD BANK**

|  |
| --- |
| **STANDARD CRITICAL VALUES** |
| **TEST** | **NOTIFICATION REQUIRED** |  |
| Antibody work up delays | Yes |  |
| Hemolytic Transfusion Reactions | Yes |  |
| No Compatible Blood Available | Yes |  |
| Positive Coombs-infants | Yes |  |

**UCH LAB CRITICAL VALUE NOTIFICATION LIST (continued)**

**MICROBIOLOGY**

|  |
| --- |
| **STANDARD CRITICAL VALUES** |
| **TEST** |  |  |
| Blood Culture |  All Positive Cultures |  |
| Gram Stains on Sterile Body Fluids |  Presence of Bacteria |  |

**IMMUNOLOGY**

|  |
| --- |
| **STANDARD CRITICAL VALUES** |
| **TEST** |  |  |
| Influenza A and B |  All Positives |  |
| RSV  |  All Positives |  |

**POINT OF CARE**

|  |
| --- |
| **STANDARD CRITICAL VALUES** |
| **TEST** | LOW | **HIGH** |
| Glucose (Whole blood) | < 50 mg/dl | > 400 mg/dl |
| Glucose (Neonate) | < 40mg/dl | >250 mg/dl |

**Clinical Interventional Value: High: INR >5.0**

All patients seen by a pharmacist at the time the INR is obtained and the pharmacist decides on the interventional

action according to their protocol. The Laboratory’s intent is to establish a clinical interventional value to expedite

repeat finger stick testing.

**Required Reportable Diseases and Conditions**

Amoebiasis Meningococcal Invasive Disease

Anthrax Plague

Bacteremia in newborns Meningococcemia

Botulism Microsporidiosis

Brucellosis Mumps

Campylobacter Infection Pertusis

Chlamydia Infection Poliomyelitis

Cholera Psittacosis

Coccidioidomycosis Q Fever

Congenital Coccidioidomycosis Rabies

Creutzfeldt-Jakob Ricin Toxin

Cryptosporidiosis Rocky Mountain Spotted Fever

Cyclosporiasis Rubella & Congenital Rubella Syndrome

Dengue Fever Salmonellosis (Nontyphoid fever types)

Diphtheria Shiga-Like Toxin Production

E. coli 0157:H7 Infection Shigellosis

Ehrlichiosis Smallpox (other orthopox viruses)

Encephalitis, Infectious Staphylococcal Enterotoxin

Giardiasis Streptococcal Invasive Disease (types A & B)

Gonorrhea Streptococcus Pneumoniae (invasive)

Haemophilus Influenzae (invasive disease) Syphilis

Hansen Disease (Leprosy) Trichinosis

Hantavirus Infection Tuberculosis

Hepatitis, Viral (Types A,B,C, and all other types) Typhoid Fever

Human Immunodeficiency Virus Infection Typhoid or Nontyphoid Salmonellosis

Isoporiasis Varicella (chickenpox, fatal cases only)

Legionellosis Vibriosis, Nonchlorea ++

Leptospirosis Viral Hemorrhagic Fevers (all types)

Listeriosis Viral Hepatitis (Types A,B,C Delta)

Lyme Disease Viral Meningitis

Malaria Yellow Fever

Measles Yersiniosis

Meningitis (Bacterial or viral) Tuberculosis

Meningococcal Invasive Disease Tularemia

+ Reportable by unique patient identifying number, which is the last four digits of their social security number, birth date,

 gender, and race.

++ The Director of the Medical Laboratory need not report vibriosis, nonchlorea, under Subsection (B)(59) of this section if the

 disease is found in a specimen obtained from the patient’s teeth, gingival tissues, or oral mucosa.

**BID ISOLATES**

\* Beta Strep Gp A & B

\* Haemophilus influenzae

\* Listeria

\* N. Meningitidis

\* S. pneumoniae

 Any Vancomycin resistant staphylococcal species

 \* From sterile body site

**Test Ordering**  Refer to the following methods:

* Routine Requests: Physicians and nurses are urged to order the majority of testing for the 5 a.m. collection on the night before service is desired. Results of most of the work collected on this round will be available via computer by 12 p.m. Phlebotomy rounds are conducted at 5 a.m., 7 a.m., 10 a.m., 12 p.m., 2 p.m., 4 p.m., 6 p.m., 8 p.m. and 10p.m. at UM/Upper Chesapeake Medical Center. Phlebotomy rounds are conducted at 7 am, 9 a.m., 11 a.m., 1 p.m., 4 p.m., 7 p.m., and 10 p.m. at UM/Harford Memorial Hospital. Please do not call the laboratory to draw blood for routine requests. These will be collected during rounds.
* STAT Requests: STAT requests should be used only if absolutely necessary. They are collected and processed immediately. Please note that abuse of STAT classification results in delay of routine and true STAT requests. **Note:** The use of “Now” is not recognized terminology. Please use routine, STAT, or urgent. If “Now” is used, it will be considered an urgent test.
* Urgent Requests – should be used for: -Timed Requests: Requests for laboratory specimens to be collected at a specific time are to be ordered as “Urgent”. –ASAP Requests: In the hospital computer system, “Urgent” replaces “ASAP” terminology. These tests are performed after STAT testing and before routine testing. Use of “Urgent” will expedite testing without interference with STAT workload.

**Requests for Laboratory Services** The laboratory will only perform test at the request of a physician or authorized individual as defined by the State of Maryland. Technologists are not authorized to accept or reject requests for extraordinary services. Such requests must be directed to the pathologist. Please refer to the following for instructions on requesting laboratory services:

* Inpatient Requests: Requests for laboratory services (except for Anatomic Pathology) are to be entered into computer terminals by nursing personnel using the Order Entry Module. Cytology requests, in addition to being ordered through the Order Entry Module, must be accompanied by a computer-generated requisition.

**Note:** Surgical specimens for Anatomic Pathology are not to have testing ordered through the Order Entry Module, but should be ordered using an approved requisition form.

* Outpatient Requests: Requests for services on outpatients must be in writing from attending physician. A verbal request must be followed by a written order. Essential order elements include: - Adequate patient identification, which is the

 patient’s name and date of birth. –Name and address of ordering physician so that

 test results will be forwarded to that physician

 correctly. –Must list tests or assays requested. –Date and time of specimen collection, where the

 physician has deemed it as necessary. –ICD-9 code(s) for Medicare patients. Non-Medicare

 patient requisitions must include a narrative

 diagnosis or signs/symptoms for the patient.

* Preadmission Testing: All physicians are encouraged to take advantage of preadmission testing. Use of “Preadmission Request Form” will enable the laboratory to expedite the process. These forms can be obtained from Admitting.
* Presurgical Testing: Physicians are encouraged to have specimens collected in the Presurgical Testing area located in the Klein Ambulatory Care Building or the Presurgical Testing area at UM/Harford Memorial Hospital. This testing is performed at UM/Upper Chesapeake Medical Center Monday through Friday, 7 a.m. to 7 p.m. This testing is performed at UM/Harford Memorial Hospital Monday through Friday, 8 a.m. to 2:30 p.m. It is desirable that appointments be made in advance to specimen collection area. Presurgical Testing provides pre- and postoperative teaching, preoperative instructions, physical assessments, and are available to answer patient questions. Contact UM/Harford Memorial Hospital Presurgical Testing at 443-843-8078 or UM/Upper Chesapeake Medical Center Presurgical testing at 443-643-3660 for additional information. **Note:** Should Presurgical Testing hours of operation not be convenient for a patient, laboratory collection of a specimen is available with physician orders.

 **PRIORITY TESTING**

 Testing from the ED, ICU, Labor and Delivery, OR, and the Nursery have highest priority. The following tests take

 priority over all other tests requested whenever unusual circumstances dictate.

**HEMATOLOGY**  **CHEMISTRY**

WBC & Hematocrit Glucose

(Differential if WBC is BUN

 < 2,000 or > 50,000) Creatinine

PT, PTT and Fibrinogen Electrolytes (Na, K, Cl, Co2)

Cell Count - CSF & Body Fluids

**URINALYSIS**  **MICROBIOLOGY**

Urinalysis without microscopic Gram Stain

**BLOOD BANK**

Crossmatch

Transfusion Reaction Workup

 **STAT TESTING**

**BLOOD BANK**

Type and crossmatch (STAT and ER patients)

Transfusion reaction workups

Delivery/preparation of:

 Red Blood Cells Leukocyte Reduced

 Apheresis Platelets Leukocyte Reduced (when available)

Pooled Cryoprecipitate AH

 \*Autologous/directed donations of packed cells

 Plasma, frozen within 24 hours after phlebotomy

 \*Ordered through UM/Upper Chesapeake Medical Center Laboratory Blood Bank in advance.

NOTE: Antibody problems will be evaluated on a case-by-case basis to determine

 availability products.

**CHEMISTRY**

Acetaminophen Iron

Albumin Ketones

Alkaline phosphatase Lactic Acid

ALT LDH

Ammonia Lipase

Amphetamines Lithium

Amylase Magnesium

AST Myoglobin

Barbiturates Opiate

Benzodiazepines Osmolality

BNP (Pro) PCP

BUN Phenobarbital

Calcium Phosphorus

Chloride Potassium

CK Pregnancy test (urine & serum)

CKMB Salicylate

CO2 Sodium

Cocaine Tegretol (Carbamazepine)

Creatinine THC

CSF proteinTheophylline

CSF glucose Total bilirubin

Digoxin Total protein

Dilantin (Phenytoin) Troponin

Direct Bilirubin Valproic Acid

Ethanol Vancomycin

Fetal Lung Maturity hsCRP

Ionized Calcium Glucose

Gentamicin Methadone

**HEMATOLOGY**

CBC ESR

Manual differential Sickle cell testing

Reticulocyte count D-dimer

Fibrinogen Cell count – CSF, pleural fluid, ascitic fluid, joint fluid

FDP Monospot

PT Kleinhauer/Betke Testing

PTT

**URINALYSIS** **MICROBIOLOGY**

Urinalysis Gram Stain

Planting CSF specimens

Rapid Strep Screen Group A

RSV testing

Influenza testing

Rotavirus (UCMC dayshift only)

**HISTOLOGY**

Frozen sections – frozen sections occurring after 5pm Monday through Friday or on weekends must be scheduled in advance with the Pathologist. Other procedures available on a case-by-case basis upon consultation with Pathologist.