

# **Appendix AA**

## **State Laboratory Directory**

**STATE OF MARYLAND  
DEPARTMENT OF HEALTH AND MENTAL HYGIENE  
LABORATORIES ADMINISTRATION**

**GUIDE TO PUBLIC HEALTH  
LABORATORY SERVICES**

**Laboratories Administration  
201 West Preston Street  
Baltimore, Maryland 21201**

**Telephone #410-767-6100  
Toll Free # 1-877-4MD-DHMH  
Fax #410-333-5403  
e mail: josephj.@dhmh.state.md.us**

July 2000

Appendix AA

Dear Health Professionals:

This reference guide lists the public health laboratory services available to health officers and physicians to assist them in the prevention, diagnosis, and control of human diseases. The listing of laboratory services is arranged alphabetically by test.

Specimens submitted to the laboratory should be collected and submitted in special kits provided by the Laboratories Administration. These kits may also be obtained from the county health departments or from the regional laboratories of the State Health Department. Use of these kits assures conformance with postal regulations, collection of the proper type of specimen, preservation of specimen integrity, proper demographic/epidemiologic information, and prompt distribution for examination when received in the laboratory.

Records of patient information and test results are treated as confidential information and given only to the submitting physician or other legally authorized individuals.

Public health professionals and physicians using the Administration's services are invited and urged to visit the Central Laboratory in Baltimore or their regional laboratory when possible. A few minutes spent in the laboratory can often result in clarification of points regarding types of tests performed, specimen mailing kits available, and many other points important to effective use of laboratory services. Also such personal contacts not only improve services but can be informative to the physician and stimulating to the laboratorian in coordinating the practice of modern scientific medicine.

J. Mehsen Joseph, Ph.D., Director  
Laboratories Administration

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**A. GENERAL INFORMATION**

**A.1 CENTRAL LABORATORY:**

Hours: Monday thru Friday  
8:00 a.m. - 4:30 p.m.

Location: O'Conor State Office Building, Laboratory Tower  
201 West Preston Street  
Baltimore, MD 21201

Mailing Address: Laboratories Administration  
P.O. Box 2355  
Baltimore, MD 21203-2355

**DIRECTOR'S OFFICE**..... 410-767-6100

**CENTRAL LABORATORY** ..... FAX No. 410-333-5403

REGISTRATION and LAB REPORTS..... 410-767-6116  
DIVISION OF FISCAL SERVICES ..... 410-767-6102  
DIVISION OF ENVIRONMENTAL HEALTH CHEMISTRY ..... 410-767-5838  
DIVISION OF ENVIRONMENTAL HEALTH MICROBIOLOGY ..... 410-767-6125  
DIVISION OF PUBLIC HEALTH MICROBIOLOGY ..... 410-767-6125  
DIVISION OF NEWBORN AND CHILDHOOD LABORATORY SCREENING  
NEWBORN SCREENING (PKU, HEMOGLOBIN DISORDERS, ETC) ..... 410-767-6170  
CHILDHOOD LEAD POISONING SCREENING ..... 410-767-5086  
DIVISION OF MOLECULAR BIOLOGY ..... 410-767-5772  
DIVISION OF VIROLOGY and IMMUNOLOGY ..... 410-767-6152  
DIVISION OF QUALITY ASSURANCE, SAFETY and TRAINING..... 410-767-6909

**A.2 REGIONAL PUBLIC HEALTH LABORATORIES' HOURS AND LOCATIONS**

**EASTERN SHORE REGIONAL LAB (ESRL - Salisbury):**

Monday thru Friday-Hours: 8:00 a.m. - 5:00 p.m.  
Location: Holly Center - Cottage 500  
926 Snow Hill Road  
Salisbury, MD 21802  
Director, Robert L. Waltersdorff, Ph.D. ....410-219-9005 - FAX 410-219-9005  
Branch Chief, Robert Wharton

**SOUTHERN MARYLAND REGIONAL LAB (SMRL - Cheverly):**

Monday thru Friday-Hours: 8:30 a.m. - 4:30 p.m.  
Location: Cheverly Regional Laboratory  
3001 Hospital Drive - Main Lab. 1st Floor  
Cheverly, MD 20785  
Head Cheverly Regional Lab  
Deborah delVillar ..... 301-386-0206 - FAX 301-341-6277

**WESTERN MARYLAND REGIONAL LAB (WMRL - Cumberland):**

Monday thru Friday-Hours: 8:00 a.m. - 4:30 p.m.  
Location: Cumberland Regional Laboratory  
12500 Willowbrook Road  
Cumberland, MD 21502  
Head Cumberland Regional Lab  
Lane J. Ahlburn..... 301-777-2115 - FAX 301-777-2021

### **A.3 MARRIAGE CANDIDATES**

Candidates who contemplate marriage outside the State of Maryland may contact the Laboratories Administration's Registration Section at 410-767-6116 to determine if the State in which the ceremony will occur requires a premarital blood test and test documentation involving an official certificate. The Laboratories Administration maintains a supply of premarital certificates for other states and will provide them to individual marriage candidates upon request.

### **A.4 COURIER SERVICE**

The Laboratories Administration contracts to provide specimen courier service for many local health departments. Problems concerning the courier service should be reported immediately by calling 410-767-6116.

### **A.5 SPECIMEN REJECTION POLICY**

The Laboratories Administration's specimen rejection policy helps assure the accuracy, reliability, and timeliness of laboratory test results by precluding the testing of unacceptable specimens.

When the lab determines that a specimen is unacceptable for testing the lab, whenever feasible, notifies the submitter immediately by telephone, confirms the notification in writing, and temporarily retains the specimen for possible future testing (e.g., in cases where additional information provided by the submitter would make the specimen acceptable for testing).

### **A.6 BILLING**

Questions concerning client billing, laboratory billing, and laboratory reimbursement by the Maryland Medical Assistance Program or other third party payer should be directed to the Head of the Laboratory Administration's Billing Unit by telephoning 410-767-6908.

### **A.7 RABIES** (see page 14)

## **B. SPECIMEN SUPPLIES, PACKAGING, TRANSPORT, AND DELIVERY**

### **B.1 Packaging For Transport**



Care must be taken to assure a proper transport environment for specimens. Collect recommended quantities of test specimen, and follow all directions for recording date and, where appropriate, time of specimen collection. Also make every effort to see that specimens are transported at required temperatures and in appropriate shipping/ mailing containers. **Mailing containers and other specimen supplies are available from the lab's Supply Unit (tel 410-767-6121).** In addition, always separate glass tubes by using either protective material or separate cardboard mailing containers to prevent breakage and cross-contamination during transport (see instructions, below, under U.S. mail and figure on next page). Submitters using a courier service should take similar precautions by submitting individual tubes and requisition slips in separate sealable plastic bags protected in a cardboard or styrofoam shipping container.

#### **B.1.a Via Courier:**

Specimens requiring freezing should be frozen and packed with adequate cooling material to maintain their proper temperature for up to 36 hours during transport and handling prior to analysis. "Coolers" are sometimes used as containers for room temperature or frozen specimens to protect them against transportation temperature variations. Therefore it is essential that **all** shipping containers be properly labeled. Each shipping container should specify the conditions for storage on all visible outer surfaces - "**ROOM TEMPERATURE,**" "**REFRIGERATE,**" or "**FREEZE.**" Each label must indicate the date of shipment. In addition, rabies specimen containers should be prominently labeled "**RABIES.**"

#### **B.1.b Via U.S. Mail:**

When using mailing assemblies provided by the lab, use correct types and sizes for collection and transport of specimens. The design of these assemblies is determined by the nature of specimen material, type of examination, and transit time.

The regulation that describes the requirements for proper packaging and shipping of biomedical material by mail is found in 42 CFR Part 72 - Interstate Shipment of Etiologic Agents. It is the intent of the regulation that biomedical material that may contain etiologic agents will be packaged and shipped in such a way that the contents will not leak and will arrive in good condition.

**MAILING SUPPLIES AVAILABLE FROM LAB'S SUPPLY UNIT**

MAILING CONTAINER

POSTAGE - PAID  
MAILING LABEL

"Materials containing certain etiologic agents" means material **known to contain or reasonably believed** (by the shipper) **to contain** an etiologic agent from a list included in the regulation. Patient specimens that would be expected to contain an etiologic agent should be shipped according to the requirements in Part 72.3.

The set of instructions for this material is as follows:

- 1) The material to be shipped shall be placed in a **securely closed, watertight** tube, vial, ampule or the like that is referred to as primary container.
- 2) The primary container is then placed in a **durable, watertight** container referred to as the secondary container.
- 3) Several primary containers can be placed in a single secondary container, so long as the total contents of the primary containers does not exceed 50 ml.
- 4) Absorbent material must be placed in the space at the top, bottom, and sides between the primary and secondary containers. There must be enough absorbent material to absorb the entire contents of the primary container(s) in case of breakage or leakage and should be nonparticulate, i.e., not sawdust, vermiculite, etc.
- 5) Each set of primary and secondary containers is then placed in an outer shipping container constructed of corrugated fiberboard, cardboard, wood, or other material of equivalent strength. This means that most, if not all, bags, envelopes, and the like are not acceptable outer shipping containers.

A special label (illustrated on the previous page) must be placed on the outer shipping container. This label identifies the package as containing etiologic agents and directs anyone observing damage to the package or leakage of contents to call CDC.

## **B.2 DELIVERY/DROP-OFF TO CENTRAL LAB**

### Specimen Delivery:

Specimens intended for the Central Laboratory should be directed to the O'Connor Building located at 201 W. Preston Street, Baltimore, MD (21201). The Laboratory Tower is located at the Southeast corner of the building nearest the junction of Howard Street and Martin Luther King Blvd. Parking for specimen delivery to the laboratory is available in the underground garage via entrances on Preston Street. Take the elevators in the center of the garage (not the northeast corner) up to the lobby level (see below).

### **B.2.a** Week Days (Monday - Friday, except holidays):

#### **8:00 a.m. - 6:30 p.m.:**

During normal working hours specimens should be delivered directly to the Registration Section (Room L-42). A window is staffed in the Laboratory Tower's lobby for receipt of specimens. Specimens **should not** be dropped off in the refrigerated chute during this time or analysis of the specimens may be delayed. A courier delivering specimens to L-42 in the Central Laboratory is required to sign a log sheet to verify their delivery and acceptance by the laboratory.

#### **6:30 p.m. - 8:00 a.m.:**

After 6:30 p.m. specimens **should** be placed in the refrigerated drop-off chute on the east side of the loading dock, on Martin Luther King Blvd. Specimens requiring room temperature storage **should not** be delivered at this time.

**B.2.b. Saturdays (7:00 a.m. - 10:00 a.m.):**

During these hours couriers should deliver specimens directly to the Registration Section (Room L-42). A window is available in the Laboratory Tower's Lobby for receipt of specimens. Specimens **should not** be placed in the refrigerated drop-off chute during this time or their analysis may be delayed. A courier delivering specimens to L-42 in the Central Laboratory is required to sign a log sheet to verify their delivery and acceptance by the laboratory.

**If you should encounter difficulty in entry to the laboratory ask the guard to telephone the Registration Office at extension 6116 for assistance.**

After 10:00 a.m. on Saturdays specimens should be placed in the refrigerated drop-off chute on the east side of the loading dock, on Martin Luther King Blvd. Specimens requiring room temperature storage **should not** be delivered at this time. Prior to Christmas and New Year holidays, a more specific schedule will be sent to the Health Departments. (See last page)

**B.2.c. Sundays and Holidays:**

Specimens should be placed in the refrigerated drop-off chute on the east side of the loading dock, on Martin Luther King Blvd (see map). Specimens requiring room temperature storage **should not** be delivered on these days.

**B.3 TEST KITS AND OTHER LABORATORY SUPPLIES**

The Laboratories Administration provides test request forms, specimen collection kits, collection directions, and mailing outfits for many different tests and clinical specimens to users of its services. Different tests and specimens require different types of collection devices, transport media and transport containers.

Using the incorrect kit or container will often render a test specimen unacceptable for analysis. Supplies requests and questions should be directed to the nearest regional lab or the Central Lab's Supply Unit (410-767-6121).



## **C. SPECIMEN COLLECTION, PREPARATION, AND HANDLING**

### **C.1. General:**

Specimen quality is a product of the nature of the specimen itself, how well it was collected, and the manner in which it was transported to the laboratory. A laboratory can provide accurate and clinically relevant test results only if it receives good test specimens.

Before attempting to collect a specimen, look up the desired test(s) in this reference guide. Check to see if there are specific requirements for:

- 1) Specimen type or volume;
- 2) Collecting procedure;
- 3) Collecting devices or containers.

Use the correct test request form and properly and legibly complete this form to ensure accurate and efficient laboratory service. Use a soft ~~point~~ or black ball point pen to write the information. Please give the clinic's full mailing address to assure proper return of test results. Then see that the test request form accompanies the specimen.

The following sections provide practical guidelines to physicians, nurses and other non-laboratorian health personnel who must routinely collect and submit clinical specimens to one of the State's public health laboratories (i.e., Department of Health and Mental Hygiene's Laboratories Administration).

#### **C.1.a. Patient Preparation:**

Prior to the time scheduled to collect a patient's specimen the patient should receive appropriate instructions concerning fasting, diet, and medication restrictions. For example, a patient about to submit a specimen for a microbiology culture should have specimen(s) collected before starting antimicrobial therapy.

#### **C.1.b. Specimen Handling by Submitter:**

The most common specimen handling errors include failing to:

- 1) Tighten specimen container lids or caps;
- 2) Label a specimen correctly; and
- 3) Provide all pertinent clinical information.

Properly identifying specimens is extremely important. Legibly label each specimen container or tube with the patient's full name, and date of specimen collection, just as they appear on the test request form. Information on specimens should be checked against information on the test request form before the specimen is sent to the laboratory.

## **C.2 PROCUREMENT AND SUBMISSION REQUIREMENTS, PRECAUTIONS AND PROBLEMS BY SPECIMEN TYPE:**

### **a. Blood/Serum:**

#### **1) Hemolysis**

In general, grossly or even moderately hemolyzed blood specimens may not be acceptable for testing. Hemolyzed serum is pink or red, rather than the normal clear straw color. Most cases of hemolysis can be avoided by observing the steps listed below.

- a) Use a needle no smaller than 20- or 21- gauge. (On occasion, however, it may be necessary to use a 22- or 23- gauge needle for patients from elderly and pediatric populations with small or difficult veins.) Hemolysis can be avoided by not placing small gauge Butterfly needles into Vacutainer tubes.

**Carefully and safely** remove Butterfly and replace with a 16 gauge needle before penetrating Vacutainer tube.

- b) If there is air leakage around the needle or loss of vacuum in the tube, replace the vacuum tube.
- c) Collect blood in room temperature containers unless the specimen requirement specifies otherwise.
- d) When a vacuum tube fills too slowly due to an incomplete venipuncture, damage to the red blood cells may result. Correct by deeper vein entry or select another puncture site and collect a second specimen.



- e) Do not remove the needle from the vein until the vacuum tube is completely filled or the tube is pulled back from holder to release pressure. Premature removal causes a rush of air to enter the tube, with resultant damage to the red cells.

## **2) Paired Sera/Parallel Testing**

Both acute and convalescent sera are required to determine recent infection. Acute sera may be tested immediately and then stored until the convalescent sera are submitted. When both sera are available parallel testing under identical testing conditions will be performed to assure an accurate comparison of acute and convalescent antibody titers. See Submission of Specimen for Viral Studies (p.16).

## **3) Vacuum Tubes Containing Anticoagulants**

When using vacuum tubes containing anticoagulants and preservatives:

- a) Tap the tube gently at a point just below the stopper to release any additive adhering to the tube or stopper.
- b) Permit the tube to fill completely to ensure the proper ratio of blood to additive.
- c) To ensure adequate mixing of blood with the anticoagulant or preservative, use a slow rolling wrist motion to invert the tube gently five or six times. Rapid wrist motion or vigorous shaking contributes either to small clot formation or hemolysis and fails to initiate proper mixing action.
- d) Check to see that all the preservative or anticoagulant is dissolved. If any preservative powder is visible, continue inverting the tube slowly until the powder is dissolved.
- e) If multiple samples are being drawn, invert each specimen as soon as it is drawn. Do not delay.

## **4) Vacuum Tubes without Anticoagulants**

When using vacuum tubes containing no anticoagulants or preservatives: or SST Serum Separator Tubes:

- a) Permit the tube to fill completely.
- b) Let the specimen stand for a minimum of 30 minutes and not longer than 45 minutes prior to centrifugation. This allows time for the clot to form. If the specimen is allowed to stand for longer than 45 minutes, chemical activity and degeneration of the cells within the tube will take place, and test results will be altered as a consequence.
- c) Centrifuge the specimen at the end of the 30- to 45- minute period in strict accordance with the manufacturer's instructions for speed and duration of centrifugation.

#### **5) Quantity Not Sufficient (QNS)**

One of the most common errors in specimen collection is the submission of an insufficient quantity of sample for testing. To ensure an adequate amount of specimen:

- a) Always draw whole blood in an amount 2½ times the required volume of serum needed for a particular test. For example, if 4 mL serum are required, draw at least 10 mL whole blood.
- b) For most profile testing submit one full tube of serum (8-10 mL).

#### **b. Entomological Specimens:**

Identification of insects of medical importance (e.g. ticks) can be provided as a referral service. Please call the Microbiology Division (410-767-6135) prior to submitting insect specimens.

#### **c. Rabies Specimens:**

Heads of animals associated with human exposure (i.e., animals biting humans) are examined in the Central Laboratory in Baltimore. Correct preparation for transportation is essential. Specimens **not** accepted for rabies examination include: (1) rabbits and rodents which

have not bitten a human; (2) birds and poultry; and (3) reptiles and amphibians. The laboratory cannot accept animals larger than a 20 pound dog; only the head (or brain) of larger animals should be submitted.

**Packing - RABIES SPECIMENS MUST BE PACKED WITHIN TWO SEPARATE WATERTIGHT CONTAINERS.**

The inner watertight container must contain only the specimen. Tightly sealed, heavy duty plastic bags are recommended. Bloody specimens should be double bagged. The outer watertight container may contain frozen refrigerator packs. If at the Laboratory will require more than (4) four hours, the specimen should be refrigerated. **DO NOT FREEZE SPECIMEN** or pack with dry ice since thawing time delays the examination and impairs testing procedures.

**Transporting/Shipping - Do not use** U.S. Postal Service, which may not accept such specimens, or United Parcel Service, which has no special delivery. When possible hand delivering of specimens is preferred because it is the most reliable and direct method of transport. Courier service is available through the local health departments. Attach request form (DHMH Form 1188, Rabies Examination and Human Exposure History). Deliver specimens to the Laboratory Registration Section, Lobby Level, O'Connor Building, 201 W. Preston Street.

**During Non-working Hours** - Specimens should be delivered to the Central Laboratory, using the drop-off chute located at the loading dock of the O'Connor Office Building on Martin Luther King Blvd. near Howard Street. In a true emergency situation, arrangements be made to have the specimen tested promptly by telephoning in the following sequence until an individual is reached who can provide the necessary service.

- 1) 410-876-6117
- 2) 410-466-2912
- 3) 301-865-5174
- 4) 410-484-2196

**C.2.d. Submission of Specimens for Viral Studies**

**1) Viral Culture Specimens/Direct Antigen Detection**

Isolation of a virus from clinical material does not establish an etiologic diagnosis per se. The significance of such a virus depends upon the source of the isolate. For example, isolation of a virus from the brain in encephalitis or from the spinal fluid in aseptic

meningitis provides direct evidence of an etiological association. Isolation of an influenza virus from throat washings of a patient ill with an influenza-like disease strongly suggests that the virus is the causative agent since this virus is only isolated from throat washings in acute influenza. In contrast, the isolation of an enteric virus from the stool of a patient suffering from aseptic meningitis does not by itself indicate an etiological relationship, as enteroviruses are occasionally found in the feces of healthy individuals. Additional supporting evidence is obtained by demonstrating a fourfold rise in antibody titer against the virus isolated.

A negative viral culture report does not preclude the possibility of the suspect virus or another virus being involved in the patient's disease. The cultures may be negative because of specimen procurement problems, such as prolonged transportation ~~processing~~ delays, procurement of sample too late in the course of the disease, or inability of some viruses or viral strains to adapt to growth in the tissue culture cell lines selected.

Therefore, it is extremely important that acute and convalescent sera (paired sera) be examined to complete the laboratory phase of virus diagnosis by attempting to provide serologic confirmation in the absence of a virus isolation, or to determine the significance of a virus isolated with respect to the current illness.

Direct antigen detection for RSV, HSV, and Influenza A correlates well with viral recovery by conventional tissue culture. Direct detection is limited by the quantity of viral antigen present and the quality of the specimen.

The two most important steps in viral isolation are the specimen collection and specimen transportation.

Since the detection of viruses are more likely to be achieved early in the illness, specimens for most viral diseases should be collected as soon as a viral infection is suspected.

Submission of adequate specimens and patient's history is essential. Blanket requests for "Virus Study" should not be submitted. Information should specify the group of viruses suspected. Please indicate suspected infecting agent as well as additional information such as chief symptoms, clinical test results, epidemiology data, immunizations, etc. This will guide the laboratory in choosing which virological procedures and host systems should be inoculated. Since many viruses die rapidly once they have been separated from host tissues, specimens must be delivered to the Virology Laboratory immediately after collection.

Stool specimens for enteroviruses (polio, coxsackie, ECHO) should be shipped on wet ice. Specimens for CMV, Varicella-Zoster, Influenza, Respiratory Syncytial, and Human Immunodeficiency Virus cultures should be delivered on wet ice immediately after collection (within 2-3 hours). Any specimen for virus isolation other than those previously listed should be shipped frozen in a dry ice outfit. Seal specimen container tightly to prevent ingress of toxic carbon dioxide vapors.

Whenever possible, submit both acute and convalescent sera from patients for whom virus isolation tests are being requested.

For a more rapid diagnosis, the direct antigen detection for Respiratory Syncytial Virus, Influenza A virus, Varicella Zoster virus, Rotavirus, and Herpes simplex virus is available at the Virology-Immunology Laboratory.

**C.2.d.2) Specimen Procurement Instructions for Viral Studies**

SPECIMEN	PROCUREMENT	TRANSPORT CONTAINER & SPECIAL INSTRUCTIONS

Blood	Collect in green top tube. (Heparin)	
CSF	Collect with usual aseptic precautions (at least 2 ml).	Sterile screw-capped tube
Eye	Collect with usual aseptic precautions.	Viral Transport media
Mouth	Rub inner side of both cheeks opposite upper molars plus floor of mouth, any ulcerated areas that may be present.	Viral Transport media
Rectal	Insert swab at least 5 cm into orifice, rotate the swab before withdrawing.	Viral transport media
Stool	Collect 4-8 grams of specimen.	Plastic screw cap container
Throat	Swab tonsillar area and back of pharynx.	Viral transport media
Nasopharyngeal Aspirate	Aspirate using #8 French catheter and trap.	
Tissue	Biopsy and Autopsy specimens must be taken aseptically.	Sterile sealed container. When possible, add viral transport media
Urine Bacterial Culture Chlamydia	A clean freshly voided urine First voided urine	Sterile plastic container. For CMV recovery, specimen must still be warm when processed.
Vesicle fluid and scrapings	Gently wipe a fresh vesicle with alcohol, and dry. Aspirate fluid using 26g ½ needle.	Place scrapings in viral transport media. Avoid bleeding (virus may be inactivated by antibody).

### C.2.d.3

### HEPATITIS

EST PROFILE	HBsAg	HBsAb	HBcAb-IgM	HBcAb-TOTAL	HBcAg	HBcAb	ANTI-DELTA	HAVAb-IgM	HCV
ACUTE CLINICAL HEPATITIS	X	X		X				X	X
CARRIER STATUS	X	X		X					

PRENATAL SCREENING	X								
SOURCE OF PERCUTANEOUS EXP.	X	X		X					
RECIPIENT OF PERCUTANEOUS EXP.	X	X		X					
IMMUNITY STATUS/PREVACCINATION SCREENING	X	X		X					
POST-VACCINATION SCREENING		X							

- NOTE:**
1. If no box is marked, we will test for HBsAg only.
  2. Any time that the patient is positive for HBsAg, the other B markers and anti-delta will be done on the same serum.
  3. If a patient is positive for HBsAb, then the HBcAb-total or other further testing is not necessary and will not be done.
  4. To minimize the cost of testing, the technician will use his/her judgment and knowledge of the interaction of the various markers to determine if particular testing is necessary. Always feel free to call the laboratory (410-767-6169) if you require an explanation of the testing you received, or wish to order a specific test in an unusual circumstance.
  5. If patient has acute clinical hepatitis and HBsAg is negative HBcAb test will be done on the same serum.

<b>Test Name</b>	<b>Div./ Lab</b>	<b>Specimen Type Volume</b>		<b>Contain er or Transpo rt Media</b>	<b>DHMH outfit</b>	<b>Usual Turn Around Time</b>	<b>Comments Special Requirements</b>
ABO Grouping (see Immunohematology Rh)	VIR-IMM						
Adenovirus Serology (see Complement Fixation)	VIR-IMM						
Adenovirus Culture	VIR-IMM	Throat wash Throat swab Stool	1 ml fluid 1 ml fluid 4 grams	Sterile	#33 Viral Throat Swab #8 Enteric pathogen	1 - 5 weeks	Leave swab in fluid. Deliver on wet ice.
AFB Smear/Culture (see Tuberculosis Bacteriology)	MICRO						
AFP (Alpha- fetoprotein) (see Neural Tube Defects)	NBS						
AHD (Antihyaluronidase) (see Streptococcal Enzyme Test)	VIR-IMM						
AIDS (HIV) (see retrovirology)	VIR-IMM						
AIDS Virus, Culture (see Retrovirus Culture)	VIR-IMM						
Alpha fetoprotein (AFP) (see Neural Tube Defects)	NBS						
Amebiasis, Antibodies, Titers (see Parasite Serology)	VIR-IMM						
Aminoacid and Enzyme Disorders (see Newborn Screening)	NBS					Abnormal 24 hrs. Normal - 7 days	Abnormal results telephoned
Anti-DNase B (see Streptococcal Enzyme Test)	VIR-IMM						



<b>Test Name</b>	<b>Div./ Lab</b>	<b>Specimen Type Volume</b>	<b>Contain er or Transpo rt Media</b>	<b>DHMH outfit</b>	<b>Usual Turn Around Time</b>	<b>Comments Special Requirements</b>
Anthrax Cutaneous	MICRO	Wound		AMIES	#16 Miscellaneous	
Anthrax Pulmonary	MICRO	Sputum		Sterile Jar	#17 Misc. Jar	Call Lab at X6125 as soon as possible.
Anti-streptolysin-O (ASO) (see Streptococcal Enzyme Test)	VIR-IMM					
Antistreptolysin O (ASO) Test Group A Strep (see Streptococcal Enzyme Test)	VIR-IMM					
Arbovirus, Culture	VIR-IMM	Brain & cord Throat wash CSF	4 grams 2 ml 2 ml	Sterile		Negative & Positive Results 3-4 weeks Deliver on wet ice. Submit paired sera if possible.
Arbovirus, Serology	VIR-IMM	Serum	2 ml	RT	#34 Virus blood	5 days Submit acute and convalescent sers if possible.
Aseptic Meningitis, Virus Isolation	VIR-IMM	Throat Stool CSF Autopsy Brain	1 ml fluid 4 g 1 ml fluid 4 g	RT	#33Viral throat swab #35 Virus stool	2 - 5 weeks Ship on wet ice. Leave swab in fluid
Aspergillosis Antibody Test (see Fungal Serology)	VIR-IMM					
Aspergillosis Culture (see Fungal Mycology)	MICRO					
Babesia	VIR-IMM	Serum and/or whole blood slides	2 ml	RT	#27 Serological test	Requires special form to be sent with specimen. OI from lab. Call lab at x 6152 before submitting specimen.
Bacillus anthracis (see Anthrax)	MICRO	Wound/Sputum		AMIES Sterile Jar	#16 Miscellaneous Culture	
Bacillus cereus Culture	MICRO	Stool		Screw-Cap Jar	#17 Misc. jar	72 hours

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<b>Test Name</b>	<b>Div./ Lab</b>	<b>Specimen Type Volume</b>		<b>Contain er or Transpo rt Media</b>	<b>DHMH outfit</b>	<b>Usual Turn Around Time</b>	<b>Comments Special Requirements</b>
Bacterial isolates for identification	MICRO	Isolate		Trypticase Soy or Blood Agar Slants			Method: Culture
Bacterial Serology	VIR-IMM	Serum	2 ml	RT	#27 Serological test	5 days	
Bartonella Serology	VIR-IMM	Serum	2 ml	RT	#27 Serological test	5 days	
Beta hCG à Human Chorionic Gonodotropin (see Down Syndrome/Trisomy 18)	NBS						
Beta thalassemia (à thalassemia) (See Hemoglobin Disorders)	NBS						
Beutler Test (see Newborn Screening)	NBS						
Biotinidase (see Newborn Screening)	NBS						
Blastomycosis, Culture (see Mycology/Fungal)	MICRO						
Blastomycosis, Serology (see Complement Fixation)	VIR-IMM						
Blood culture	MICRO				#3 Blood culture	6 days (Prelim 48 hour)	Only previously inoculated blood culture bottles will be accepted. Only done for Western Maryland Cent and Office of the Medical Examiner
Blood Grouping (see Immunohematology/Rh)	VIR-IMM	Whole Blood	8 ml	RT	#25 Rh & STS	3 - 5 days	No subgroups reported. Forward and reverse group done.
Blood Lead	NBS						See Lead, Blood
Blood Phenylalanine (PKU) (see Newborn Screening)	NBS						

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<b>Test Name</b>	<b>Div./ Lab</b>	<b>Specimen Type Volume</b>		<b>Contain er or Transpo rt Media</b>	<b>DHMH outfit</b>	<b>Usual Turn Around Time</b>	<b>Comments Special Requirements</b>
Blood Testing, Venereal (see Syphilis Serology)	VIR-IMM						
Blood Typing Lab (see Immunohematology/Rh)	VIR-IMM						
Bordetella pertussis Antibody Test (see Bacterial Serology)	VIR-IMM						
Borrelia burgdorferi, Culture	VIR-IMM	Skin Biopsy/ Blood	5 ml	LT/GT		7-28 days	Call lab at x6159 for special procedure.
Borrelia burgdorferi, Serology (see Lyme Serology)	VIR-IMM						
Botulinum Toxin	MICRO	Serum	5 ml				Method: Submitter must prearrange with micro lab delivery for testing. Specimens must be refrigerated Call 410-767 6149 or 410-767-6135.
Botulinum Culture	MICRO	Stool and gastric contents		Screw-Cap Jar		72 hours	Submitter must notify laboratory 410-767-6135. Specimen must be refrigerated.
Brucella Cultures	MICRO	Blood culture bottle				30 days	Micro lab must be notified prior to submission. (C x 6135 or x 6125.
Brucella Serology (see Bacterial Serology)	VIR-IMM						
Campylobacter	MICRO	Stool		Cary Blair			Method: Culture
Canine Brucellosis (see Bacterial Serology)	VIR-IMM						
Cat Scratch Fever, Serology	VIR-IMM	Serum	2 ml	RT	#27 Serological test		Requires special form sent with specimen. Obtain f lab. Call lab before submitting specimen. Call x 6152.

<b>Test Name</b>	<b>Div./ Lab</b>	<b>Specimen Type Volume</b>		<b>Contain er or Transpo rt Media</b>	<b>DHMH outfit</b>	<b>Usual Turn Around Time</b>	<b>Comments Special Requirements</b>
CD4 Count (see Flow Cytometry)	VIR-IMM						
CD4/CD8 Ratio (see Flow Cytometry)	VIR-IMM					5 days	
CD4 Lymphocyte Testing (see Flow Cytometry)	VIR-IMM						
CF (Complement Fixation)	VIR-IMM	Serum	2 ml	RT	#27 Serological test		Avoid hemolysis. Always submit acute & convalescent specimens at least 14 days apart.
Chagas Disease, Serology (Trypanosoma cruzi)	VIR-IMM	Serum	2 ml	RT	#27 Serological test		Requires special form sent with specimen. Obtain f lab. Call lab before submitting specimen. Call x6
Chancroid	MICRO			AMIES	#16 Misc. culture	12 days	Specimen must be kept refrigerated.
Chickenpox, Culture (Varicella Zoster)	VIR-IMM	Throat swab Vesicle fluid Biopsy specimen	1 ml fluid 1 ml fluid 4 grams	Sterile	#33 Viral throat swab	1 - 4 days (DFA) Neg. 3 - 4 weeks Pos. 3 - 4 weeks	Do not freeze. Deliver on wet ice.
Chickenpox, Immunity Studies (see Varicella Zoster Serology)	VIR-IMM						
Chickenpox, Serology (see Varicella Zoster Serology)	VIR-IMM						
Chlamydia, Culture	VIR-IMM	Swab sent in chlamydia transport medium			#7 Chlamydia culture kit	7 days	Specimens are to be kept cold, <b>not frozen</b> , followin collection, and sent to lab within 24 hours.
Chlamydia, Serology (see Complement Fixation)	VIR-IMM						
Chlamydia DFA	VIR-IMM	Slide			Request Chlamydia	24 - 48 hours	Read and follow collection instructions carefully.

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Test Name	Div./ Lab	Specimen Type Volume	Contain er or Transpo rt Media	DHMH outfit	Usual Turn Around Time	Comments Special Requirements
					slide kit.	Fix with acetone at your site.
Chlamydia LCR	VIR-IMM	Urine	15 - 20 ml	Sterile		24 - 48 hours Transport at 2 - 4°C within 24 hours.
Chlamydia EIA	VIR-IMM	Swab sent in transport tube			Chlamydia EIA kit	5 days Transport at 2 - 25°C
CID Culture (see CMV Culture)	VIR-IMM					
CID Serology (see CMV Serology)	VIR-IMM					
Citrobacter diversus Typing	MICRO	Isolate		Trypticase, soy agar slant		72 hours
Clostridium difficile Toxin	MICRO	Stool	2 grams	Screw-Cap Jar	#17 Misc. Jar	48 hours Method: Enzyme Immunoassay <b>Must</b> be a <b>fresh</b> specimen and shipped under <b>refrigeration</b>
CMV Isolation Culture (Cytomegalovirus)	VIR-IMM	Urine Saliva Blood (Buffy Coat)	1 ml 1 ml 2 ml	Sterile Sterile LT/green top		Neg. 3 - 4 weeks Pos. 3 - 4 weeks Do <b>NOT</b> freeze specimen. Ship on wet ice. Collec ASAP after onset.
CMV Serology	VIR-IMM	Serum	2 ml	RT		5 days
Coccidioides Culture (see Mycology/Fungal)	MICRO					
Coccidioides, Serology (see Complement Fixation)	VIR-IMM					
Complement Fixation (CF)	VIR-IMM	Serum	2 ml of serum or 5 - 8 ml of clotted blood	RT	#27 Serological test or #34 Virus blood outfit	5 - 10 days Avoid hemolysis. Always submit acute and convalescent specimens at least 14 days apart. Method: Complement fixation
Complete Blood Count (CBC)	HEME	Whole Blood	5 ml	LT	#12 Hematology	1 day <b>Gently invert</b> tube 6-8 times to mix blood with El anticoagulant; <b>DO NOT SHAKE</b>

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Test Name	Div./ Lab	Specimen Type Volume	Contain er or Transpo rt Media	DHMH outfit	Usual Turn Around Time	Comments Special Requirements
Congenital Hypothyroidism (see T4-Thyroxine, TSH)	NBS					
Coxsackie, Culture	VIR-IMM	Throat wash Swab Stool CSF	1 ml fluid  4 grams 1 ml fluid	Sterile	#33 Viral throat swab #35 Virus stool	2 - 5 weeks  Leave swab in fluid. Deliver promptly on wet ice.
Cryptococcal Antibody (see Fungal Serology)	VIR-IMM					5 days
Cryptococcus Culture Smear	MICRO					See Mycology
Cryptococcus Antigen	VIR-IMM	CSF	1 ml	Sterile Tube		ASAP <24 hours
Cryptosporidium	MICRO	Stool			#15 Intestinal Parasite	48 hours DFA & AF Smear
Culture (Misc)	MICRO	Ear, Eye, Nose,  Tracheal Aspirate	Swab	  Screw Cap Jar		48-72 hours Method: Culture - <b>Dry swabs are unacceptable</b> , to be kept moist in Amies or other transport media or preservative free sterile saline.
Culture (Misc)	MICRO	Sputum		Screw-Cap Jar		48-72 hours Method: Culture - Sputum must be a deep cough specimen.
Cyclospora	MICRO	Stool			#15 Intestinal Parasite	48 hours Smear AF
Cysticercosis	VIR-IMM	Serum	2 ml	RT	#27 Serological test	Requires special form to be sent with specimen. OI from lab. Call lab at x 6152 before submitting specimen.
Cytomegalovirus (CMV)	VIR-IMM	Urine, saliva, blood, (buffy coat)	1 ml of fluid	LT, GT	#17 Misc. Jar	5 days Method: Tissue culture Unstable and sensitive to freezing and thawing. <b>DO NOT</b> freeze. Deliver on ice. Specimens should be collected as soon as possible after onset.

Test Name	Div./ Lab	Specimen		Contain er or Transpo rt Media	DHMH outfit	Usual Turn Around Time	Comments Special Requirements
		Type	Volume				
Darkfield (T. Pallidum) Direct FA-DFA	VIR-IMM	Lesion fluid	Smear	Slide	#10 G-U Slide	2 days	Do not heat fix slide. Let it air dry. No fixation required.
Delta Virus (see Hepatitis Serology)	VIR-IMM						
Dengue Fever	VIR-IMM	Serum	2 ml	RT	#34 Virus blood		Requires special form to be sent with specimen. Ol from lab. Call lab at x 6152 before submitting specimen.
Diphtheria Anti-Toxin Level (see Bacterial Serology)	VIR-IMM					10 days	
Diphtheria Culture	MICRO	Throat Swab			#31 Throat culture	72 hours	
Down's Syndrome	NBS	Serum	3 ml	RT	#2 AFP	5 days	Please supply all information requested on lab form
E Antigen/Antibody for Hepatitis (See Hepatitis Serology)	VIR-IMM						
E Coli: 0157:H7 Serotyping	MICRO	Pure Isolate		Trypticase soy agar slant		1 - 2 weeks	Method: Agglutination test . Submit only sorbitol negative E Coli. Do <b>NOT</b> submit on plated media
EBV (Epstein Barr Virus), Serology	VIR-IMM	Serum	2 ml	RT	#34 Virus blood	5 days	
Echinococcus Titers (Hydatid Disease) (see Parasite Serology)	VIR-IMM	Serum	2 ml		#27 Serological test		Requires special form to be sent with specimen. Ol from lab. Call labs at x6152 before submitting specimen.
Echovirus Culture	VIR-IMM	CSF Stool Throat wash swab	1 ml 4 g 1 ml fluid	Sterile	#35 Virus stool #33 Viral throat swab	3 - 4 weeks	Leave swab in fluid. Deliver promptly on wet ice.
EEE (Eastern Equine Encep.) Arbovirus Serology) (See	VIR-IMM						

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Ehrlichia	MICRO	Whole Blood	8 ml	LT, GT or Smear		72 hours	Smear of buffy coat
Ehrlichia, Serology	VIR-IMM	Serum	2 ml	RT	#27 Serological test		Requires special form to be sent with specimen. OI from lab. Call labs at x 6152 before submitting specimen.
Encephalitis, Culture (Brain Matter)	VIR-IMM	Post-mortem Brain & cord CSF	4 grams 2 ml	Sterile		3 - 8 weeks	Deliver promptly on wet ice.
Encephalitis, Serology (see Arbovirus Serology)	VIR-IMM						
Entamoeba histolytica (see Parasite Serology)	VIR-IMM						
Enteric Viruses, (Tissue Culture Method) : Enterovirus, Coxsackievirus, Poliovirus, and Adenovirus	VIR-IMM	CSF Stool Throat Wash Swab	1 ml 4 grams 1 ml fluid	Sterile	#8 Enteric pathogen #33 Viral throat swab	See Comments	Deliver promptly on wet ice. Negative results - 3-4 weeks Positive Preliminary Results - 2-3 weeks Positive Final Results - 2-4 weeks
Enterovirus, Serology (see Virus Neutralization)	VIR-IMM						
Epstein-Barr Virus (EB Virus), (see EBV Serology)	VIR-IMM						
Estriol (unconjugated) (uE3) (see Down Syndrome/Trisomy 18)	NBS						
Eye Culture, Viral	VIR-IMM	Eye Swab	1 ml fluid	Sterile		1 - 5 weeks	Leave swab in fluid. Ship on wet ice.
Febrile Agglutination (see Bacterial Serology)	VIR-IMM						



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Fifth Disease (see Parvovirus Serology)	VIR-IMM						
Flow Cytometry (CD4 Enumeration)	VIR-IMM	Anti-coagulated blood	Tubes: > ½ full	1 Green Top 1 Purple Top	See comments	5 days	Testing services provided for state facilities and local health departments only.
Fluorescent Treponemal Antibody (FTA) (see Syphilis Serology)	VIR-IMM	CSF				5 days	
Fluorometric Assay (PKU) (see Phenylalanine Quantitation)	NBS						
FTA (Syphilis) (see Syphilis Serology)	VIR-IMM						
FTA-ABS (Fluorescent Treponemal Antibody Absorption)	VIR-IMM	Serum	0.5 ml Serum	RT	#18 Misc. Tube - STS	3 days	
Fungal Culture	MICRO					4 weeks ( time held)	See Mycology
Fungal Serology (Antibody)	VIR-IMM	Serum	2 ml	RT	#27 Serological test	5 days	Avoid hemolysis. Submit acute and convalescent s 14 days apart.
Fungal Smear	MICRO	Skin, Nails, Tissue CSF Respiratory Specimens			#17 Misc. Jar or #18 Misc. Tube		Method: KOH, India Ink, Gram stain Primarily Fungal smears are used as follows but m be done as requested: KOH usually done on all dermatological specimens. India ink done on CSF Cryptococcus. Gram stain done on all respiratory specimens. Giemsa stain done on lung tissue and c bone marrow to look for Histoplasma
Galatosemia Screening (see Newborn Screening)	NBS						
Genital Cultures	MICRO	Genital		AMIES	#16 Misc. Culture	48 hours	Method: Culture Isolation for Group B Strep, Gardnerella done on request.

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German Measles (Rubella) Isolation	VIR-IMM	Throat washing/ Swab sputum, Urine	1 ml or 1 swab in 1 ml fluid		#33 Viral throat swab #17 Misc. Jar	4-6 weeks  Leave swab in fluid. Ship on wet ice.
German Measles (Rubella)	VIR-IMM					See Rubella Serology
Gonorrhea Culture	MICRO	Cervical, rectal, throat, urethral		Trans grow bottle or Mod. Thayer-Martin	#11 GC	24-48 hours  <b>Do not refrigerate</b> after specimen is collected.
Guthrie - PKU (see Newborn Screening)	NBS					
HAV (Hepatitis-A) (see Hepatitis Serology)	VIR-IMM					
Haemophilus influenzae	MICR	Isolate		Chocolate Agar Slant		48-72 hours  Method: Serotyping Be sure to send a fresh isolat
Hantavirus Serology	VIR-IMM	Serum	2 ml	RT	#18 Misc. tube	3 days  Call lab at x6154 before submitting.
HCG (see Trisomy 18)	VIR-IMM					
Hemoglobin Disorders (Hemoglobinopathy)	NBS	Whole Blood	5 ml	LT	#13 Hemoglobin Electrophoresis	5 days  <b>Gently invert</b> tube 6-8 times to mix blood w/EDT anticoagulant, <b>DO NOT SHAKE</b> .
Hemoglobin A <sub>2</sub> Quantitative	NBS	Whole Blood	5 ml	LT	Hgb disorders	5 days  Lavender top tube or microtainer - <b>gently invert</b> tut 8 times to mix blood w/EDTA anticoagulant. <b>DO NOT SHAKE</b> . Capillary tubes <b>NOT</b> acceptable.
Hepatitis C or HCV (See Hepatitis Serology)	VIR-IMM	Serum				
Hepatitis Serology	VIR-IMM	Serum	2 ml	RT	#32 Viral hepatitis	See Comments  HBs Antigen - 2 days HBs Antibody - 2 days HBc Antibody - 3 days HBc IgM ab - 5 days

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						HBe Ag/Ab - 5 days HAV IgM Ab - 5 days HCV IgM Ab - 5 days Anti-Delta - 5 days
Herpes Virus Isolation ( Tissue Culture Method)	VIR-IMM	Vesicle fluid Genital Swab Lesion scraping Throat wash	1 ml fluid		#14 Herpes culture	Neg. 2 - 4 days Pos. 2 - 4 days  Leave swab in fluid. Ship on wet ice.
Herpes Simplex (HSV) Virus, Serology	VIR-IMM	Serum	2 ml	RT	#34 Virus blood	5 days
Herpes Zoster Culture (see Chickenpox Culture)	VIR-IMM					
Herpes Zoster, Serology (see Varicella Zoster Serology)	VIR-IMM					
Histoplasma Culture (see Mycology/Fungal)	MICRO					
Histoplasma Serology (see Complement Fixation)	VIR-IMM					
HIV-1 Antibody (ELISA)	VIR-IMM	Serum	1 ml	RT	#36 Retrovirus	<b>ELISA results:</b> <b>Neg.:</b> 24-48 hours <b>Indeterminate:</b> 4 - 7 days <b>Reactive:</b> 3 days  Method: EIA/WB Unique identifier number must used.
HIV-AIDS Culture	VIR-IMM	Whole Blood	20 ml			Special request test - must contact lab at x6163 for instructions.
HIV-AIDS Serology (see Retrovirology)	VIR-IMM					No patient names - use a unique identifier to protect confidentiality.

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HIV (Viral Load)	VIR-IMM						Special request test - must contact lab at x6163 for instructions.
HIV-1p24 Antigen	VIR-IMM	Serum, Whole Blood	2 ml	RT	#36 Retrovirus	5 days	
Homocystinuria (see Newborn Screening)	NBS						
HSV Serology (see Herpes Simplex Virus, Serology)	VIR-IMM						
HTLV I/II Virus, Culture (see Retrovirology)	VIR-IMM						Special request test-must contact lab at x6163 for instructions.
HTLV-I/II Virus, Serology (see Retrovirus Serology)	VIR-IMM						
HTLV-II Antibody (see Retrovirus Serology)	VIR-IMM	Serum, Whole Blood	1 ml				
Human Chorionic Gonadotropin (âhCG), (see Trisomy 18)	VIR-IMM						
Immunohematology/Rh Typing	VIR-IMM	Whole blood	8 ml	RT		1 - 3 days	Antibody identification done on all positive antibody screens. Antibody titers done only for Anti-D.
Infectious Mononucleosis Screen	VIR-IMM	Whole blood	1 ml	RT	#34 Virus blood	5 days	See EBV Serology
Influenza, Isolation	VIR-IMM	N.P. Throat wash/swab, tissue Biopsy spec Autopsy spec	1 ml	Sterile	#33 Viral throat swab	3 days	Deliver promptly on wet ice. Leave swab in fluid.
	VIR-IMM						

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Influenza Serology (Type A & B) (See Complement Fixation)							
Kala Azar (Leishmania)	VIR-IMM	Serum	2 ml	RT	#27 Serological test	Requires special form and must meet specific criteria. Contact lab at x6152 .	
LaCross Encephalitis	VIR-IMM	Paired Sera CF, HI					
Larva migrans (see Toxocara Canis Serology)	VIR-IMM						
LCM (Lymphocytic Chorio Meningitis), Isolation	VIR-IMM	CSF Brain Tissue	2 ml 4 grams	Sterile		4 - 5 weeks	
LCM (Lymphocytic Chorio Meningitis), Serology (see Complement Fixation)	VIR-IMM						
Lead, Blood, Screen	LEAD	Whole Blood	250 ul (Microlitre)	Microtainer	#4 Blood Lead Screen	24 hours	To avoid contamination, follow instructions for proper collection.
Lead, Blood, Confirmation	LEAD	Whole Blood	3 ml	LT	#5 Blood Lead Conf	24 hours	Use ONLY the 3 ml lavender top tubes provided by Laboratories Admin.
Legionella Culture/Antigen Detection	VIR-IMM	Sputum BAL/urine		Sterile		5-14 days-culture 5 days-Ag detection	
Legionella Serology (pneumophila) (see Bacterial Serology)	VIR-IMM					3 - 14 days	
Legionnaires' Disease (see Bacterial Serology)	VIR-IMM						
Leishmaniasis (see Kala Azar)	VIR-IMM						
Leptospira Culture	VIR-IMM	Urine and	1 ml	Transport	Leptospira Transport	5 - 30 days	Submit blood/urine in first week of Leptospira

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		Whole Blood		Medium Required	Medium		infection. Submit urine for culture after 7-10 days o suspected Leptospira infection. Use transport medi for culture specimen. Transport specimen at room temperature and protect from exposure to light.
Leptospirosis Serology (see Bacterial Serology)	VIR-IMM					5 days	
LGV - Lymphogranuloma Venereum, Isolation (see Chlamydia Culture)	VIR-IMM						
LGV - Lymphogranuloma Venereum, Serology (see Complement Fixation)	VIR-IMM						
Listeria Culture	MICRO			AMIES	#16 Misc. culture	5 days	
Listeria Monocytogenes, Serology	VIR-IMM	Serum	2 ml	RT	#27 Serological test		Requires special form and must meet specific criteri Contact lab for further information., X6152.
Lyme Culture (see Borrellin Burgdorferi culture)	VIR-IMM						
Lyme Serology	VIR-IMM	Serum	2 ml	RT	#27 Serological test	5 days	
Lymphocyte Sub-Set Immunophen. typing CD4 (see Flow Cytometry)	VIR-IMM						
Malaria, Serology	VIR-IMM	Serum	2 ml	RT	#27 Serological test		Requires special form & must meet specific criteria, Contact lab for further information., X6152.
Malaria Smears	MICRO	Whole Blood Smears	4 Smears (2 thick and 2 thin)			24 hours	Method: Microscopic/Giemsa stain Submit thick thin blood smears made without anticoagulant. If n information is needed, please call the Microbiology 410-767-6135 before collecting specimen.
Measles (Rubeola) Virus, Isolation	VIR-IMM	Urine Throat wash	1 ml 1 ml	Sterile	#33 Viral throat swab	1 - 5 weeks	Deliver on wet ice.

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		Throat swab Sputum	1 ml fluid 1 ml			
Measles Antibody Titer (Serology), see Vaccine Preventable Disease, Serology	VIR-IMM	Serum	2 ml	RT	#34 Virus blood	1 - 5 days  Borderline or equivocal results are <u>not</u> acceptable pr of immunity for clinical illness. Send acute and convalescent specimens.
Meningitis, Fungal (see Cryptococcal Ag/Ab or Mycology CSF)	VIR-IMM					
Meningitis, Viral Culture	VIR-IMM	Throat wash Throat swab Stool CSF Brain autopsy	1 ml 1 ml fluid 4 grams 1 ml 4 grams	Sterile	#33 Viral throat swab #35 Viral stool	2 - 5 weeks  Deliver on wet ice. Leave swab in fluid.
Microsporidium	MICRO	Stool			#15 Intestinal Parasite	72 hours  Modified Trichrome stained smear
Mononucleosis (see Heterophile Antibody)	VIR-IMM					
MSUD (Maple Syrup Urine Disease) (see Newborn Screening)	NBS					
Mumps Virus, Isolation	VIR-IMM	Urine Throat wash Throat swab	1 ml 1 ml 1 ml	Sterile	#33 Viral throat swab	1 - 5 weeks  Deliver on wet ice. Leave swab in fluid.
Mumps Antibody Titer (also see Vaccine Preventable Disease, Serology)	VIR-IMM	Serum	2 ml	RT	#34 Virus blood	1 - 2 days  Borderline or equivocal results are <u>not</u> acceptable pr of immunity.
Murine Typhus (see Rickettsial Serology)	VIR-IMM					5 days

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Mycology CSF	MICRO						
Mycology -Fungal	MICRO	Body Fluids See specific specimen type below	5 - 10 ml	RT or Screw- Cap Jar	#17 Misc. Jar	4 weeks	
Mycology Referred Culture	MICRO	Mold, yeast		Screw-Cap Tube	#18 Misc tube	Varies with each fungus	Submit all fungi for identification in screw cap tube Sabouraud or other appropriate media. Plates <b>NOT</b> acceptable
Mycology-Fungal	MICRO	Abscess		RT (Sterile) or Screw Cap Jar Culturette /AMIES	#16 Misc. culture	Neg. Held for 4 weeks	Method: Culture Swabs are only acceptable when transported in AMI or culturette. Best to collect by needle and syringe place in a sterile container;
Mycology-Fungal	MICRO	Bone marrow	0.2 ml - 0.3 ml	Green Top Tube SPS Tube (Yellow stopper vacutainer)	#18 Misc. tube	4 weeks preliminary report	Method: Culture Clotted Bone marrow is unacceptable. Pediatric isolator blood culture system may be used for collection. Also may use SPS tube (Yellow stopper vacutainer or green top heparinized tube. 37°C temperature to be maintained until processing time. Should be processed within 2 hours SPS - Sodium Polyanethol Sulfonate.
Mycology-Fungal	MICRO	CSF	3 ml (approx.)	Screw-Cap Tube Screw-Cap Jar RT	#18 Misc. tube #17 Misc. jar	4 weeks	Method: Culture Hold at 30 to 35 °C. If process is delayed for more than several hours.
Mycology-Fungal	MICRO	Lung tissue, other tissue, biopsies		Screw-Cap Jar RT	#17 Misc. jar	4 weeks - 12 weeks to rule out Histoplasma	Method: Culture Specimens should be kept moist with a minimal amount of sterile distilled water or preservative-free saline; deliver to laboratory within hours.
Mycology-Fungal	MICRO	Nail, hair, skin scraping		Sterile Container Jar or Tube RT	#17 Misc. jar or #18 Misc. Tube	Negatives held 4 weeks	Method: Culture Swabs are unacceptable. Collection: nails-clean with 70% alcohol, collect shavings and material under nail plate. Hair-collect hairs with base of shaft. Skin



<b>Test Name</b>	<b>Div./ Lab</b>	<b>Specimen Type Volume</b>	<b>Contain er or Transpo rt Media</b>	<b>DHMH outfit</b>	<b>Usual Turn Around Time</b>	<b>Comments Special Requirements</b>	
						scrapings-clean site with 70% alcohol, moisten lesi with sterile water or saline. Collect from edge and center of lesion as well as any exudate if present. N refrigeration required for transport or storage (room temperature - optimal).	
Mycology-Fungal	MICRO	Sputum, trachea, bronchial wash; bronchial brush	5 - 10 ml	Screw-Cap Jar Centrifuge Tube 50 ml	#17 Misc. jar #28 Sputum (TB culture)	4 weeks - 12 weeks to rule out Histoplasma	Method: Culture - Early morning specimens prior t eating, rinsing mouth or brushing teeth. Deliver to under refrigeration. For Bronchial Brush use appro ml of <u>preservative free sterile saline</u> . Unacceptable-( 24 hour collections & pooled specimens. (B) Specimens in non-sterile containers. (C) Swal for sputum collection.
Mycology-Fungal	MICRO	Stool					Method: Culture Stool fungal cultures must be arranged with testing laboratory. Collect freshly passed feces. Store and transport at 4°C. (Refrigerate)
Mycology-Fungal	MICRO	Urine	25 - 50 ml Desirable	Screw-Cap Jar Centrifuge Tube 50 ml	#17 Misc. jar #28 Sputum (TB culture)		Method: Culture Not acceptable: 1) 24 hour urin specimens; 2) Urine from catheter bags. Specim may be held at 4°C up to 12 hours before processing
Mycology-Fungal	MICRO	Vaginal/ cervical/ ear/ throat/ nasopharynx		Culturette, or AMIES transport medium	#16 Misc. culture	3 weeks	Method: Culture Dry swabs are unacceptable. Collect 1 or 2 swabs; keep moist. Store and or transport under refrigeration (4°C). If two swabs are sent, direct exam can be done.
Mycology-Fungal	MICRO	Whole Blood		Yellow Top SPS or Isolator		4 weeks; 12 for Histo	Method: Culture Clotted blood unacceptable. Collect (a) 8 ml Yellow Stopper SPS; (b) 10 ml ir the Isolator which must be processed within 9 hour
Mycoplasma Hominis Serology	VIR-IMM	Serum Blood	2 ml		#34 Virus Blood	3 - 6 days	
Mycoplasma Pneumoniae, Culture	VIR-IMM	Lower resp.	5 ml	Mycoplasma	#19 Mycoplasma/	7 - 21 days	Read collection kit's instructions carefully and follo

<b>Test Name</b>	<b>Div./ Lab</b>	<b>Specimen Type Volume</b>		<b>Contain er or Transpo rt Media</b>	<b>DHMH outfit</b>	<b>Usual Turn Around Time</b>	<b>Comments Special Requirements</b>
		tract specimen		Transport	Ureaplasma culture		them exactly.
Mycoplasma Pneumoniae, Serology (see Complement Fixation)	VIR-IMM					7 - 13 days	
Neisseria Meningitidis Grouping	MICRO	Isolate		Chocolate Agar Slant Preferred	N/A	48 - 72 Hours	Method: Serogrouping Submit a fresh isolate with proper identification.
Neonatal Hypothyroidism Neonatal T4/TSH (see Newborn Screening)	NBS						
Neural Tube Defects	NBS	Serum Amniotic fluid	3 ml 3 ml	RT	#2 AFP	5 Days	
Newborn Screening (for Inherited Disease)	NBS	Dried blood spot	5 spots for < 7 days old; 4 spots for > 7 days old	Business envelope Do not use plastic bags	NB DHMH 77 Sub DHMH 79	NB - 7 days Sub - 10 - 14 days	Includes PKU, BCK, Homocystinuria, Tyrosinemia, Galactosemia, Biotinidase Def., Hypothyroidism, and Hemoglobinopathies.
Newcastle Disease	VIR-IMM	Serum	2 ml	RT	#27 Serological test		Requires special form. Call lab before submitting.
Norwalk Virus	VIR-IMM	Stool	4 grams	Sterile	#35 Virus stool		Call lab at x 6152 before submitting specimen. Antigen detection in stool.
Organisms for Identification	MICRO	Isolate		Trypticase Soy or Blood Agar Slants		Approx. 5 - 10 days	Method: Culture Also, see Enteric Bacterial Isolat Check Enteric
Ova & Parasites Examination	MICRO	Stool	Follow package insert instructions		Para Pak Ecofix	24 Hours	Method: Microscopic examination. Also see pinwo examination.
Ox-Cell Hemolysin Test (see Heterophile Ab)	VIR-IMM						
Parainfluenza Culture	VIR-IMM	Throat wash	1 ml	Sterile	#33 Viral throat swab	1 - 5 weeks	Deliver on wet ice.

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Test Name	Div./ Lab	Specimen		Contain er or Transpo rt Media	DHMH outfit	Usual Turn Around Time	Comments Special Requirements
		Type	Volume				
		Throat swab, Autopsy spec. Biopsy spec.	1 ml 4 grams 4 grams				
Parainfluenza I, II, III (see Serology Complement Fixation)	VIR-IMM						
Parasite Serology	VIR-IMM	Serum	2 ml	RT	#27 Serological test	5 days	
Parvovirus B-19 Serology	VIR-IMM	Serum	2 ml	RT	#34 Virus blood	5 days	Test results can be used for research purposes only.
Pertussis Cultures (Whooping Cough)	MICRO	Naso/ Pharyngeal Swab			Pertussis culture kit Call 410-767-6140 to obtain kit	7 - 10 days	Method: Culture and DFA Send specimen prom Room temperature
Pertussis, Agglutination/Serology (See Bacterial Serology)	VIR-IMM					5 days	
Phenylalanine Quantitation PKU Levels	NBS	Blood spot	5 spots	Business envelope Do not use plastic bags.	NB/DHMH 77	1 - 2 days	
Pinworm Examination	MICRO	Scotch tape prep			#21 Pinworm	24 hours	Method: Microscopy
PKU (Phenylketonuria) (see Newborn Screening)	NBS						
Platelet Count	VIR-IMM	Whole Blood	5 ml	LT	#12 Hematology	1 day	Gently invert tube 6 -8 times to mix blood with EI anticoagulant; do <b>NOT</b> shake.
Plague Bacillus (see Yersinia pestis Culture)	MICRO						
Pneumocystis carinii Examination	MICRO	Bronchial washing & sputum		Screw-Cap Jar	#17 Misc. jar	48 hours	Method: Staining FA/Microscopic

<b>Test Name</b>	<b>Div./ Lab</b>	<b>Specimen Type Volume</b>		<b>Contain er or Transpo rt Media</b>	<b>DHMH outfit</b>	<b>Usual Turn Around Time</b>	<b>Comments Special Requirements</b>
Pneumocystis carinii	VIR-IMM	Serum	2 ml	RT	#27 Serological test		Requires special form to be sent with specimen. Call lab before submitting.
Pneumonia (Mycoplasma), Serology (see Complement Fixation)	VIR-IMM						
Poliovirus, Culture	VIR-IMM	Stool Throat wash Throat swab	4 grams 1 ml fluid 1 ml fluid	Sterile	#35 Viral stool #33 Viral throat swab	2 - 5 weeks	Leave swab in fluid. Deliver on wet ice.
Psittacosis Isolation	VIR-IMM	Bird				3 - 5 days	
Psittacosis, Serology (see Complement Fixation)	VIR-IMM						
Q Fever (Coxiella Burnetii) (see Complement Fixation/CF)	VIR-IMM						
Rabies Ab Titer (RFFIT)	VIR-IMM	Serum	2 ml	RT	#34 Virus blood	5 days	Avoid hemolysis.
Rabies Detection	VIR-IMM	Animal Head				24 hours or less	Call lab at X6177
Rat Bite Fever	MICRO			AMIES	#16 Misc. culture	1 month	
Respiratory Syncytial Virus (RSV) Culture	VIR-IMM	Nasopharynx Wash & swab	1 ml fluid 1 ml fluid	Sterile	#33 Viral throat swab	1 - 3 days (DFA) 2 - 5 weeks culture	<b>Do not freeze.</b> Leave swab in fluid. Deliver promptly on wet ice.
Respiratory Syncytial Virus (RSV) Serology (see Complement Fixation)	VIR-IMM						
Respiratory Virus Isolation Influenza, Parainfluenza, Adeno, Mumps, Measles and RSV (For additional method see CF)	VIR-IMM	Throat wash Throat swab Biopsy spec. Autopsy spec.	1 ml 1 ml 4 grams 4 grams	Sterile	#33 Viral throat swab	See Comments	Leave swab in fluid. Ship on wet ice. Negative results - 3-4 weeks Positive Preliminary Results - 1-4 weeks Positive Final Results - 2-4 weeks Direct Ag Test for Influenza - 2 days Direct Ag Test for RSV - 3 days

<b>Test Name</b>	<b>Div./ Lab</b>	<b>Specimen Type Volume</b>		<b>Contain er or Transpo rt Media</b>	<b>DHMH outfit</b>	<b>Usual Turn Around Time</b>	<b>Comments Special Requirements</b>
Retrovirus Isolation/Culture	VIR-IMM	Culture				6 weeks	Contact Laboratory at X6151
Retrovirus Serology	VIR-IMM	Serum	2 ml	RT	#36Virus/Retrovirus	1 - 3 days	No patient names - use a unique identifier to protect confidentiality.
Rh Typing/Antibody Studies (see Immunohematology/Rh)	VIR-IMM	Whole blood	8 ml	RT	#25 Rh	3 - 5 days	Antibody identification done on all positive antiboc screens. Antibody titers done only for Anti-D.
Rickettsial Serology	VIR-IMM	Serum	2 ml	RT	#34 Virus blood	5 days	
Rocky Mountain Spotted Fever, RMSF Antibody (see Rickettsial Serology)	VIR-IMM					5 days	
Rocky Mtn Spotted Fever RMSF Antigen Test	VIR-IMM	Skin biopsy, Wood tick, or dog tick.	Frozen skin tissue on slide fixed in acet.			1 - 2 days	Method: DFA
Roseola (see Vaccine Preventable Diseases, Serology)	VIR-IMM						
Rotavirus	VIR-IMM	Stool	Swab in culturette or 4 grams	Sterile	#35 Virus stool	1 -3 days	Do not collect specimen in containers having media preservatives, animal serum or detergent.
RPR, Rapid Plasma Reagin (see Syphilis Serology)	VIR-IMM					2 days	
RSV, Culture	VIR-IMM	Nasopharynx wash & swab	1 ml fluid	Sterile	#33 Viral throat swab	1 - 3 days (DFA) 2 - 5 wks (culture)	<b>Do not freeze.</b> Leave swab in fluid. Deliver promp on wet ice.
RSV, Serology (see Complement Fixation/CF)	VIR-IMM						
RT/PCR (see Viral Load)	VIR-IMM					6 days	

Test Name	Div./ Lab	Specimen		Contain er or Transpo rt Media	DHMH outfit	Usual Turn Around Time	Comments Special Requirements
		Type	Volume				
Rubella (German Measles), Isolation	VIR-IMM	Throat wash Throat swab Sputum Urine	1 ml fluid 1 ml fluid 1 ml fluid 1 ml fluid	Sterile	#33 Viral throat swab	1 - 3 days (DFA) 2- 5 wks (culture)	<b>Do not freeze.</b> Deliver promptly on wet ice.
Rubella (German Measles) Serology (see also Vaccine Preventable Diseases, Serology)	VIR-IMM						
Rubeola, Isolation	VIR-IMM	Throat wash Throat swab Sputum Urine	1 ml fluid 1 ml fluid 1 ml fluid 1 ml fluid	Sterile	#33 Viral throat swab	4 - 6 weeks	Deliver promptly on wet ice
Rubeola Antibody Titer (see Vaccine Preventable Disease Serology)	VIR-IMM	Serum	2 ml	RT	#34 Virus Blood	1 - 2 days	Borderline or equivocal results are <u>not</u> acceptable pr of immunity.
Salmonella Serotyping	MICRO	Pure Isolate		Trypticase soy agar slant		3 days - 1 month	Method: Agglutination test Do not submit on plat media
Salmonella Antibody Test	VIR-IMM	Serum	1 ml	RT - 7 ml		5 days	Method: Agglutination test
Schistosomiasis	VIR-IMM	Serum	2 ml	RT	#27 Serological test		Requires special form to be sent with specimen. C: lab before submitting.
Sexually Transmitted Disease (see Syphilis Serology)	VIR-IMM						
Shigella Serotyping	MICRO	Pure Isolate		Trypticase soy agar slant		3 days	Method: Agglutination test. Do <b>NOT</b> submit on plated media.
Sickle Cell Screening (see Hemoglobin Disorders)	NBS						
Sickle Cell Test	NBS	Whole blood	5 ml	LT	Hgb Disorders		<b>Gently invert</b> tube 6-8 times to mix blood with El anticoagulant; <b>do NOT shake.</b>

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<b>Test Name</b>	<b>Div./ Lab</b>	<b>Specimen Type Volume</b>	<b>Contain er or Transpo rt Media</b>	<b>DHMH outfit</b>	<b>Usual Turn Around Time</b>	<b>Comments Special Requirements</b>
SLE (St. Louis Encephalitis) (see Arbovirus Serology)	VIR-IMM					
Spinal Fluid Cultures, Viral	VIR-IMM	CSF	1 ml	Sterile		4 days - 5 weeks Deliver on wet ice.
Stool Culture	MICRO	Stool	Follow insert instructions	Refrigerate	#8 Enteric pathogen	72 hours Method: Culture Covers: Salmonella, Shigella, E coli 0157:H7 and Campylobacter.
Streptococcus Grouping	MICRO	Isolate on blood agar slant				72 hours
Streptococcal Enzyme Test	VIR-IMM	Serum	3 ml	RT	#27 Serological Test	5 days Notify the lab is acute and convalescent sera are to be tested.
St. Louis Encephalitis (SLE) (see Arbovirus Serology)	VIR-IMM					
Strongyloides	VIR-IMM	Serum	2 ml	RT	#27 Serological Test	Requires special form to be sent with specimen. Call lab before submitting.
STS (See Syphilis Serology)	VIR-IMM					
Syphilis Serology	VIR-IMM	Serum	2 ml	RT	#29 STS Single tube	2 days Plasma is not acceptable for the FTA-Abs test.
T-4 (Thyroxine), Infants (see Newborn Screening)	NBS					
T4/T8 Ratio (see Flow Cytometry)	VIR-IMM					
Thalassemia (â Thalassemia) (see Hemoglobin Disorders)	NBS					
Tetanus Antitoxin (see Bacterial Serology)	VIR-IMM					10 days
Thermophilic Actinomycetes	VIR-IMM	Serum	2 ml	RT	#27 Serological test	Requires special form to be sent with specimen. Call

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<b>Test Name</b>	<b>Div./ Lab</b>	<b>Specimen Type Volume</b>	<b>Contain er or Transpo rt Media</b>	<b>DHMH outfit</b>	<b>Usual Turn Around Time</b>	<b>Comments Special Requirements</b>
						lab before submitting.
Throat Culture (Beta-Strep Only)	MICRO	Throat Swab			#31 Throat Culture	24-48 hours Method: Culture
Tick Identification	MICRO	Tick in alcohol		Screw-Cap Jar		Approx 24 hours Method: Microscopic identification
Torch Test, Congenital Infections (See Toxo-Rubella-CMV-Herpes Serologies)	VIR-IMM					
Toxocara canis, Serology (Visceral Larva Migrans)	VIR-IMM	Serum	2 ml	RT	#34 Virus blood	Requires special form to be sent with specimen. Call lab at x6152 before submitting.
Toxoplasma/Toxoplasmosis Serology	VIR-IMM	Serum	2 ml	RT	#27 Serological test	2 - 6 days
Trichinella Agglutination (Trichinosis), see Parasite Serology	VIR-IMM	Serum	2 ml	RT	#27 Serological test	5 days
Triple Screen (AFP, HCG & UE3)	NBS	Serum	7 cc blood/ 2 cc amniotic fluid	RT		5 days Please stress that all the information requested on the lab form should be filled in completely
Trisomy 18	NBS	Serum	3 ml serum	RT	#2 AFP	5 days Please supply all information requested on lab form
TSH (Thyroid Stimulating Hormone), Neonatal, (see Newborn Screening)	NBS					
Tuberculosis Bacteriology	MICRO	Aspirates or lesion material	As much as possible	Sterile Screw Cap Jar/50 ml Plastic Centrifuge Tube	#28 Sputum - TB culture	Swabs are acceptable only if volume is insufficient for aspiration. Dry swabs are unacceptable.
Tuberculosis Bacteriology	MICRO	Blood	5 ml/8 ml	Green Top (Heparin) (SPS or ACD) Yellow Top		Do NOT refrigerate blood specimens. Transport to as soon as possible. Hold at room temperature if unable to transport immediately. Do NOT submit Coagulated blood
Tuberculosis Bacteriology	MICRO	Body fluids/	5 - 10 ml	Screw-Cap Jar/50	#28 Sputum-TB	Bone marrow and other bloody specimens should be



<b>Test Name</b>	<b>Div./ Lab</b>	<b>Specimen Type Volume</b>	<b>Contain er or Transpo rt Media</b>	<b>DHMH outfit</b>	<b>Usual Turn Around Time</b>	<b>Comments Special Requirements</b>
		pleural Pericardial CSF  Bone Marrow	2 ml  1 - 2 ml	ml Plastic Centrifuge Tube RT	culture	collected in SPS (yellow) or Heparin (green) blood collection tubes.
Tuberculosis Bacteriology	MICRO	Culture for Identification	Minimum 3ml (if liquid culture submitted)	(RT) inside (50 ml centrifuge) inside (Metal container) inside (Mailer)	#28 Sputum (TB Culture) AFB Culture	TB Complex and MAC probes are assayed most days.  DNA probes are available for TB complex, <i>M. Avium</i> complex, <i>M. Kansasi</i> and <i>M. Gordonae</i>
Tuberculosis Bacteriology	MICRO	Gastric lavage	10 - 20 ml			Gastric lavage: Collect fasting early morning specimen on 3 consecutive days. Use special outfit provided Lab which contains Sodium Carbonate for neutralization
Tuberculosis Bacteriology	MICRO	Sputum, nebulized sputum, bronchial washing	5 - 10 ml	Screw-Cap Jar/50 ml Plastic Centrifuge Tube	#28 Sputum (TB Culture)	Results are faxed the day they are entered into the Lab Information System (LIS)  Collect first morning specimen on at least 3 consecutive days. Specimens are processed M-F. Any specimens arriving after 8 a.m. will be processed the next work day. Positive AFB smears will be phoned to submitter and to TB Control Program the day smears are read. Results on new patient positive cultures identified a tuberculosis Complex will be phoned to submitter as soon as identification is finalized. Susceptibility results of resistant <i>M tuberculosis</i> will be reported by phone
Tuberculosis Bacteriology	MICRO	Tissue biopsy		50 ML Plastic Centrifuge Tube Sterile Screw-Cap Jar	#28 Sputum (TB Culture)	Specimens submitted in formalin are unacceptable.
Tuberculosis Bacteriology	MICRO	Urine	25 - 50 ml	50 ML Plastic Centrifuge Tube		Urine: Collect first morning specimen on at least 3 consecutive days. Use a fresh outfit each day.
Tularemia Agglutination (see Bacterial Serology)	VIR-IMM				5 days	

<b>Test Name</b>	<b>Div./ Lab</b>	<b>Specimen Type Volume</b>	<b>Contain er or Transpo rt Media</b>	<b>DHMH outfit</b>	<b>Usual Turn Around Time</b>	<b>Comments Special Requirements</b>	
Tularemia Culture	MICRO	Wound, Sputum, Blood		Screw Cap Jar		Call the lab at X6125 as soon as possible.	
Typhoid Agglutination (see Bacterial Serology)	VIR-IMM						
Typhus Fever Antibody (see Rickettsial Serology)	VIR-IMM				5 days		
Tyrosinemia (see Newborn Screening)	NBS						
uE3 (see Neural Tube Defects)	NBS						
Undulant Fever, Agglut. (See Bacterial Serology)	VIR-IMM						
Upper Respiratory Cultures	MICRO	Naso-pharyngeal swab			Misc	48 hours	Method: Culture Submitter must indicate suspec diagnosis.
Upper Respiratory Infections, Viral	VIR-IMM	Throat wash Throat swab Biopsy/spec. Autopsy/spec	1 ml fluid 1 ml fluid 4 grams 4 grams	Sterile	#33 Viral throat swab	1 - 5 weeks	Leave swab in fluid. Deliver promptly on wet ice.
Ureaplasma urealyticum Culture	VIR-IMM	Genito-Urinary	5 - 10 ml	Mycoplasma transport	#19Mycoplasma/ Ureaplasma culture	3 -6 days	
Urine Cultures, Viral	VIR-IMM	Urine	1 ml	Sterile		1 - 5 weeks	Deliver promptly on wet ice.
Urine Culture	MICRO	Urine	5 - 10 ml	Screw-Cap Jar		48 hours	Refrigerate specimen. Must transport to lab within hours on wet ice.
Vaccine Preventable Disease, Serology	VIR-IMM	Serum	2 ml	RT	#34 Virus Blood	1 - 5 days	Borderline or equivocal results are <u>not</u> acceptable pr of immunity. For clinical illness submit acute and convalescent sera 14 days apart.

<b>Test Name</b>	<b>Div./ Lab</b>	<b>Specimen Type Volume</b>		<b>Contain er or Transpo rt Media</b>	<b>DHMH outfit</b>	<b>Usual Turn Around Time</b>	<b>Comments Special Requirements</b>
Vaginal Culture (Herpes, Viral)	VIR-IMM	Vaginal Genital	1 ml fluid	Herpes transport media	#14 Herpes culture	3 - 7 days	Leave swab in fluid. Deliver promptly on ice.
Varicella Zoster Culture (see Chickenpox Culture)	VIR-IMM						
Varicella-Zoster Virus (V-ZV), Isolation	VIR-IMM	Throat washing/ vesicle fluid/ swab biopsy	1 swab in 1 ml fluid  4 grams	#43 Viral throat swab, sterile container		Negative and Positive Results: 3 - 4 weeks	Leave swab in fluid. Deliver promptly on wet ice.
Varicella-Zoster Serology (see Vaccine preventable disease)	VIR-IMM	Serum	2 ml	RT	#34 Virus Blood	1 - 5 days	Borderline or equivocal results are <u>not</u> acceptable pr of immunity.
VDRL for CSF (see Syphilis Serology)	VIR-IMM	CSF	1 ml	RT	#27 Serological Test	5 days	<b>CSF only.</b>
Venereal Diseases (Syphilis) (see Syphilis Serology)	VIR-IMM						
Vibrio Cultures and/or Confirmation	MICRO	Isolate Cary/Blair Slant				5 - 10 days	Method: Culture
Vibrio Parahaemolyticus Culture	MICRO	Rectal swab			#8 Enteric Campylobacter/Vibrio Culture	72 hours	Method: Culture
Viral Load (HIV)	VIR-IMM					6 days	Special request test - must contact lab at x6163 for instructions.
Visceral Larva Migrans (see Toxocara Canis Serology)	VIR-IMM						
Viral Hepatitis	VIR-IMM	Serum	2 ml	RT	#32 Viral Hepatitis	3 - 7 days	

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Test Name	Div./ Lab	Specimen		Contain er or Transpo rt Media	DHMH outfit	Usual Turn Around Time	Comments Special Requirements
		Type	Volume				
Viral Isolations	VIR-IMM	Stool Throat wash CSF Tissue Urine	4 grams 1 ml fluid 1 ml fluid 4 grams 1 ml fluid	Sterile	#8 Enteric pathogen #33 Viral throat swab	1 - 5 weeks	Deliver promptly on wet ice.
WEE (see Arbovirus Serology)	VIR-IMM						
West Nile Culture (see Arbovirus Culture)	VIR-IMM						
West Nile Serology (see Arbovirus Serology)	VIR-IMM						
Worm Identification	MICRO	Worm in alcohol, saline		Screw-Cap Jar		24 hours	
Yellow Fever	VIR-IMM	Serum	2 ml	RT	#27 Serological Test		Require special form and must meet specific criteria Call lab at x6152 for further information.
Yersinia Pestis (see Bacterial Serology)	VIR-IMM						
Yersinia Pestis Culture	MICRO	Wound, Sputum, Blood		Screw Cap Jar			Call the lab at X6125 as soon as possible.
Yersinia Enterocolitica Culture	MICRO	Stool or rectal swab	Size of Marble	Cary/Blair	#8 Enteric Pathogen	72 hours	Method: Culture
Zoster Immune Titer (see Vaccine Preventable Diseases, Serology)	VIR-IMM						

## E. GUIDE TO INTERPRETATION OF SEROLOGIC TESTS

### I Bacterial Serology

### Significant Results

A. Agglutinations			
1. <i>Brucella abortus</i> .....	1:160 or greater	2. <i>Brucella canis</i>	1:80 or greater
3. <i>Tularemia</i> .....	1:160 or greater		
4. Typhoid "H" and "O"			
a. Non-vaccinated cases .....	1:160 or greater		
b. Vaccinated cases .....	1:320 or greater		
c. <i>Salmonella paratyphi</i> A and B .....	Same as Typhoid		
5. <i>Pertussis</i> (unvaccinated) .....	1:80 or greater or four-fold rise between acute & convalescent		
6. <i>Yersinia pestis</i> (Latex agglutination) .....	Four-fold rise between acute & convalescent		
B. Complement Fixation (CF)			
1. <i>Chlamydia</i> ( <i>Psittacosis</i> and <i>LGV</i> ) .....	1:64 or four-fold rise between acute and convalescent		
2. <i>Mycoplasma pneumoniae</i> .....	Four-fold rise between acute & convalescent		
C. Enzyme Immuno Assay (EIA) & <i>Borrelia</i> ( <i>Lyme Disease</i> ) ... Value >1.1 by EIA screen-			

## Western Blot (WB)

ing is considered positive for antibodies to *Borrelia burgdorferi* (Lyme Disease). IgM WB is positive when 2 of following bands are present: 24kDa (OspC), 39kDa (BmpA), 41 kDa (fla).

IgG WB is positive when 5 of following bands are present: 18kDa, 24kDa, 28kDa, 30kDa, 39kDa, 41 kDa, 45 kDa, 58 kDa, 66 kDa, 93 kDa.

**NOTE:** A positive IgM test result alone is not recommended for use in determining active disease in person with illness of longer than one month duration because likelihood of a false positive test result for a current infection is high for these persons. Positive or equivocal EIA result followed by negative WB results should be considered as negative. A negative result does not exclude the possibility of infection with *B. burgdorferi*. Early administration of antibiotics may diminish antibody response.

### D. Enzyme Reactions

#### 1. Anti-DNase B

Preschool Children.....	1:60 IU
School Children .....	1:170 IU
Adults .....	1:85 IU

#### 2. Antihyaluronidase..... 1:256 or greater

#### 3. Anti-streptolysin O..... 333 Todd units or greater

- E. Indirect Fluorescent Antibody (IFA)
1. Cat Scratch Fever ..... 1:64 or greater  
(*Rochalimaea henselae*,  
*Rochalimaea quintana*, and  
*Rochalimaea elizabethae*)
  2. Ehrlichia IFA  
E. canis ..... 1:128 or greater
  3. Legionella pneumophila..... 1:256 or greater or  
four-fold rise in titer  
between an acute &  
convalescent sera
  4. Rocky Mountain Spotted Fever (RMSF)..... 1:32 or greater
  5. Typhus - IFA  
scrub/murine ..... 1:32 or greater
- F. Indirect Hemagglutination (IHA)
1. Diphtheria antitoxin titer ..... 0.01 International Units/ml  
(protective level)
  2. Leptospira ..... 1:100 or greater
  3. Tetanus antitoxin titer..... 0.01 International Units/ml  
(protective level)
  4. Yersinia pestis IHA ..... 1:10 or greater  
(presumptive)  
1:128 or greater  
(confirmatory)

## II. Fungal Serology

## Significant Results

### A. Agglutinations

1. *Candida albicans* ..... 1:250 or greater
2. *Coccidioidomycosis* ..... Any degree of agglutination is positive, but titers 1:16 or greater are strongly indicative of dissemination
3. *Cryptococcus antigen* ..... Any titer
4. *Histoplasmosis* ..... Same as *coccidioidomycosis*
5. *Sporotrichosis* ..... 1:8 or greater

### B. Complement Fixation (CF)

1. *Blastomycosis* ..... 1:32 or greater
2. *Coccidioidomycosis* ..... 1:32 or greater
3. *Histoplasmosis*
  - a. yeast phase ..... 1:32 or greater
  - b. mycelial phase ..... 1:32 or greater

### C. Indirect Fluorescent Antibody (IFA)

1. *Candida albicans* ..... 1:128 or greater
2. *Cryptococcus neoformans* ..... 1:16 or greater

## III. Parasite Serology

## Significant Results

### A. Complement Fixation (CF)

1. Chagas disease ..... 1:8 or greater

### B. Enzyme Immuno Assay (EIA)

1. Amebiasis ..... 50 Au/ml or greater
2. Chagas disease ..... 1.0 or greater value



- 3. Schistosomiasis..... 1:8 or greater activity units  
     Immunoblot..... Positive
- 4. Toxocariasis ..... 1:32 or greater
- 5. Trichinosis..... 0.4 or greater value

C. Indirect Fluorescent Antibody (IFA)

- 1. Babesia microti..... 1:64 or greater
- 2. Chagas Disease..... 1:32 or greater
- 3. Echinococcosis..... 1:64 or greater
- 4. Leishmaniasis ..... 1:16 or greater
- 5. Malaria ..... 1:64 or greater
- 6. Pneumocystis carinii..... Any titer
- 7. Schistosomiasis..... 1:2 or greater
- 8. Toxoplasmosis..... 1:256 or greater
- 9. Trypanosomiasis..... 1:16 or greater

D. Indirect Hemagglutination (IHA)

- 1. Chagas disease ..... 1:128 or greater
- 2. Cysticercosis..... 1:128 or greater
- 3. Echinococcosis..... 1:128 or greater
- 4. Filariasis ..... 1:128 or greater
- 5. Toxoplasmosis..... 1:256 or greater
- 6. Visceral Larva Migrans
  - a. Ascaris..... 1:128 or greater
  - b. Toxocara ..... 1:128 or greater

**IV. Viral Serology**

**Significant Results**

- A. Complement Fixation (CF)
- Adenoviruses, Influenza A,B,C..... Four-fold or greater rise
  - Parainfluenza 1,2,3 in titer between acute
  - Respiratory Syncytial Virus (RSV) and convalescent sera
  - Lymphocytic choriomeningitis (LCM)
  - Arboviruses: Eastern Equine Encephalitis (EEE)
  - St. Louis Encephalitis (SLE)
- B. Enzyme Immuno Assay (EIA)
1. Cytomegalovirus (CMV) ..... PI value of 1.1 or greater  
= prior exposure  
Critical ratio 1.6  
= fourfold rise in titer  
between an acute and  
convalescent sera =  
current infection
  2. Hantavirus
    - IgG ..... 1:100 or greater =  
past infection
    - IgM 1:100 or greater =  
current infection
  3. Hepatitis A
    - HAVAB IgM..... Positive =  
early acute disease
    - HAVAB Total..... Positive =  
early recovery or  
immune
    - Hepatitis B ..... SEE FOLLOWING CHART

**DIFFERENT DIAGNOSIS OF HEPATITIS ACUTE PANEL  
(A,B, and C Infections)**

	TEST Anti-HBc	RESULT Anti HAV		
Hbs Ag	Igm	Igm	Anti HCV	Interpretation
-	-	+	-	Acute HAV infection
+	+	-	-	Acute HBV infection
-	-	-	+	HCV infection (past or current)
-	-	-	-	HCV infection possible (Follow-up in 2 months)
+	+	-	+	Co-infection of acute or recent HBV and HCV.
+	-	-	+	Co-infection of chronic HBV and chronic HCV.

HEPATITIS B SERODIAGNOSTIC ASSESSMENT

iBeAg	HBsAg	HBc IgM Ab	HBc Total Ab	HBe Ab	HBs Ab	Interpretation
-	+	-	-	-	-	Early acute (Infectious)
+	+	-	-	-	-	Early acute (Infectious)
+	+	+	+	-	-	Acute (Infectious)
-	+	+	+	+	-	Acute Seroconversion in progress (Infectious)
-	-	+	+	+	-	Convalescent (Low infectious)
-	-	+	+	+	+	Early Recovery (Immune)
-	-	-	+	+	+	Recovery (Immune)

+	+	-	+	-	-	<b>Chronic HBsAg Carrier (Infectious)</b>
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4. Herpes Simplex Virus (HSV) .....PI value of 1.1 or greater =  
Prior exposure

Critical ratio 1.6 or greater  
= Fourfold or greater  
increase in titer between an  
acute & convalescent sera =  
current infection

5. Mumps .....1:8 or greater = immunity  
or infection

6. Retroviruses

a. Human Immunodeficiency Viruses.....Reactive results indicates  
(HIV) presence of HIV antibody in  
serum. All reactive sera are  
confirmed by WB. Antigens  
used in WB are HIV protein(p)  
and glycoprotein(gp) that vary  
in their mol.wt. Important bands

are p24 (core protein) gp41,

(envelope gp).

A positive WB is presence of

gp120 and gp160

Core protein	2 bands, including one or more	envelope proteins.
		may be the only one detected in early infection or when the patient is infected with another retrovirus.
	b. Human T Lymphocytic Viruses ..... (HTLV I and HTLV II)	Reactive results indicate presence of HTLV I/II antibody in serum. All reactive sera are confirmed with WB and interpreted as follows:  SEE FOLLOWING CHART
	c. HTLV I/II	
	1) Reactivity to gag (p19 or p24) and env (gp46 or rgp21) bands=.....	HTLV-I/II Positive
or rgp 46-1)	Reactivity to gag (p19 or 24), and rgp21 bands, OR = .....	and env (gp46
		HTLV-I Positive
	Reactivity to gag gene product p24 and to an env gene product (gp46 and/or gp61/68)* = .....	HTLV-I Positive
	Reactivity to gag (p24) and env (rgp 46-II) and rgp21 bands.....	HTLV-II Positive

NOTES:

- 1) Seroreactivity to rgp46-I is specific for HTLV-I.
- 2) Seroreactivity to rgp46-II is specific for HTLV-II.
- 3) Sera reactive to rgp46-I, rgp46-II, rgp21 and p19 and p24 would be classified as dual infection.

\*Interpretation adopted by Public Health Service Working Group - must meet this criteria to be HTLV-I Positive.

7.	Rubella IgG .....	1:8 or greater = immunity or infection
	IgM .....	Positive: Current infection
8.	Rubeola.....	1:4 or greater = immunity or infection
9.	Varicella Zoster IgG.....	1:4 or greater = immunity or infection

C. Indirect Fluorescent Antibody (IFA)

1.	Arboviruses:	
	a. California Encephalitis (CE).....	1:16 or greater
	b. Eastern Equine Encephalitis (EEE).....	1:16 or greater
	c. St. Louis Encephalitis (SLE).....	1:16 or greater
	d. Western Equine Encephalitis (WEE) .....	1:16 or greater
2.	CMV IgM.....	1:10 or greater
3.	Epstein Barr Virus (EBV).....	CHART ATTACHED
4.	HSV IgM.....	1:10 or greater
5.	Mumps IgM.....	1:16 or greater
6.	Parvovirus B19 IgG .....	1:64 or greater
	IgM .....	1:16 or greater
7.	Rubeola IgM.....	1:16 or greater
8.	Varicella Zoster IgM.....	1:16 or greater

D. Virus Neutralization

1. Polio, Coxsackie, and Echoviruses.....1:4 or greater (immunity)  
Fourfold rise or greater rise in  
Titer indicates recent infection
2. Rabies RFFIT .....0.5 IU/ml or greater **OR**  
1:16 or greater (immunity)

**EPSTEIN BARR VIRUS SEROLOGY: INTERPRETATION OF RESULTS**

Footnote:	VCA		EA IgG		Anti-EBNA	Interpretation
	IgM	IgG	D	R		
a. Antibodies to the EBV nuclear antigen (EBNA) are absent during the acute phase and appear 3 weeks to 6 months after onset.	-	-	-	-	-	Non-Immune
b. IgG antibody to Viral Capsid Antigen (VCA) peaks during the acute state (3-4 wks.) and declines gradually post infection.	+	+	+	+/-	-	Current Primary Infection
c. IgM antibody to VCA peaks 3-4 weeks, disappears in 8-10 weeks.	-	+	+	+/-	-	Recent Primary Infection
d. Most patients with IM have a transient Early Antigen.	-	+	-	-	+	Past Infection
	-	+	-	+/-	+	Reactivation
	-	+	+	-	+	Nasopharyngeal Carcinoma



	-	+	-	+	+	Burkitt's Lymphoma
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## F. GUIDE TO INTERPRETATION OF HEREDITARY DISORDERS

### I. Tests

### Significant Results

#### A. Phenylketonuria (PKU) (Phenylalanine)

##### 1. Newborns:

- a. Normal.....<2.0 mg/dL
- b. Borderline .....2.1-3.9 mg/dL
- c. Abnormal.....>4 mg/dL

##### 2. Subsequents: (First well baby visit - 7 -14 days of age)

- a. Normal.....<4 mg/dL
- b. Borderline .....4.0-4.9 mg/dL
- c. Abnormal.....>5 mg/dL

#### B. Maple Syrup Urine Disease (BCK) (Leucine)

##### 1. Newborns:

- a. Normal.....<2.0 mg/dL
- b. Borderline .....2.1-3.9 mg/dL
- c. Abnormal.....>4 mg/dL

(Neonatal Emergency)

##### 2. Subsequents:

- a. Normal.....<4 mg/dL
- b. Borderline .....4.0-4.9 mg/dL
- c. Abnormal.....>5 mg/dL

(Neonatal Emergency)

C. Methionine (Homocystinuria)

1. Newborns

- a. Normal.....<1 mg/dL
- b. Borderline .....1.1-2 mg/dL
- c. Abnormal.....>2 mg/dL

2. Subsequents:

- a. Normal.....<2 mg/dL
- b. Borderline .....2.0-3.9 mg/dL
- c. Abnormal.....>4.0 mg/dL

D. Tyrosine

1. Newborns:

- a. Normal.....<10 mg/dL
- b. Borderline .....10.1-12.0 mg/dL
- c. Abnormal.....>12.0 mg/dL or greater

2. Subsequents

- a. Normal.....less than 12 mg/dL
- b. Borderline .....12.0-12.9 mg/dL
- c. Abnormal.....>13 mg/dL

E. Galactosemia - Enzyme

1. Newborns:

- a. Normal.....Presence of fluorescence or enzyme activity
- b. Abnormal.....Absence of fluorescence or enzyme activity

2. Subsequents

- a. Normal.....Presence of fluorescence or enzyme activity
- b. Abnormal.....Absence of fluorescence or enzyme activity

F. Galactosemia - Sugar

1. Newborns:

- a. Normal.....less than 10 mg/dL

- b. Borderline .....10-20 mg/dL
- c. Abnormal.....20,40,60,80, or greater mg/dL

(Neonatal Emergency)

2.

Subsequents:

- a. Normal.....less than10 mg/dL
  - b. Borderline .....10-20 mg/dL
  - c. Abnormal.....20,40,60,80, or greater mg/dL
- G.

Biotinidase

- 1. Newborns:
  - a. Normal.....Color change indicating enzyme activity
  - b. Abnormal.....Lack of color change - lack of enzyme activity
- 2. Subsequents:
  - a. Normal.....Color change indicating enzyme activity
  - b. Abnormal.....Lack of color change - lack of enzyme activity

H. Thyroxine

- 1. Newborns:
  - a. Normal.....equal to or greater than 6.5 µg/dL
  - b. Borderline .....3.0 - 6.49 µg/dL
  - c. Abnormal.....2.0 - 2.9 or less than 2.0 µg/dL
- 2. Subsequents:
  - a. Normal.....equal to or greater than 4.0 µg/dL
  - b. Borderline .....3.0 - 3.9 µg/dL
  - c. Abnormal.....2.0 - 2.9 or less than 2.0 µg/dL

I. TSH

- 1. Newborns:
  - a. Normal.....equal to or less than 30 µIU/mL

- b. Borderline .....31-40  $\mu$ IU/mL
- c. Abnormal.....equal to or greater than 40  $\mu$ IU/mL

- 2. Subsequents:
  - a. Normal.....equal to or less than 30  $\mu$ IU/mL
  - b. Borderline .....31-40  $\mu$ IU/mL
  - c. Abnormal.....equal to or greater than 40  $\mu$ IU/m

**J. Hemoglobin**

- 1. Newborns:
  - a. Normal.....FA hemoglobins
  - b. Borderline .....FAS, FAC, FAV, A, AF, ACF, ASF,  
AVF, FA(C), FA(S)
  - c. Abnormal.....FS, FC, FSC, F, FV, FSV, FCV,  
FSA, FVA, FACV, FASV
- 2. Subsequents:
  - a. Normal.....FA hemoglobins

- b. **Borderline** .....FAS, FAC, FAV, ASF, ACF, AVF
- c. **Abnormal**.....FS, FC, FSC, F, FV

## II. CLINICAL AND HEMOTOLOGIC ASPECTS OF SOME HEMOGLOBINOPATHIES

<b>Trait <sup>1</sup></b>	<b>Hb-Type</b>	<b>Clinical Severity</b>	<b>Red-Cell Morphology</b>	<b>Anemia</b>	<b>Sickling</b>
Hb-S trait	A+S	±	Normal	±	+
Hb-C trait	A+C	-	Normal	-	-
Hb-E trait	A+E	-	Normal	±	-
<b>Disease <sup>2</sup></b>	<b>Hb Types</b>	<b>Clinical Severity</b>	<b>Red-Cell Morphology</b>	<b>Anemia</b>	<b>Sickling</b>
Homozygous					
Sickle cell anemia	S+S	+++	Normocytic normochromic	+++	+
HbC disease	C+C	+	Slightly microcytic normochromic	±	-
HbD disease	D+D	-	Microcytic normochromic	-	-

HbE disease	E+E	+	Microcytic normochromic	±	-
Mixed Heterozygous					
<b>Disease <sup>2</sup></b>	<b>Hb Types</b>	<b>Clinical Severity</b>	<b>Red-Cell Morphology</b>	<b>Anemia</b>	<b>Sickling</b>
Sickle Cell HbC Disease	C+S (F*)	- to +++	Slightly microcytic, slightly hypochromic	- to +++	+
Sickle Cell HbD Disease	C +S (F*)	++		+++	+
Thalassemia Syndrome Thalassemia major	A + F	++++	Microcytic hypochromic	++++	-
Thalassemia HbS Disease	S + F + A	+ to ++++	Microcytic hypochromic	++ to ++++	+
Thalassemia HbC Disease	A + C (F*)	+ to ++	Microcytic hypochromic	- to	-
Thalassemia HbE Disease	E + F	+ to ++++	Microcytic hypochromic	+ to ++++	-

References (to "Clinical and Hemotologic Aspects of Some Hemoglobinopathies")

<sup>1</sup> Neremberg, S.T. **Electrophoresis**. F.A. Davis Co. Philadelphia. 1966. p.127.

<sup>2</sup> Modified from Chernoff (1958)

\* F may be present

### III. COMPARISON OF IRON-DEFICIENCY ANEMIA AND THALASSEMIA

Parameter	Iron-Deficiency Anemia	Beta-Thalassemia minor
RBC .....	decreased.....	normal to increased
Hemoglobin .....	decreased.....	decreased
Hematocrit .....	decreased.....	decreased
Mean Corpuscular Volume (MCV) and Mean Corpuscular Hemoglobin (MCH) .....	decreased.....	decreased
Mean Corpuscular Hemoglobin Concentration (MCHC) .....	decreased.....	normal
Serum Iron .....	decreased.....	normal to increased
Total Iron Binding Capacity (TIBC).....	increased .....	normal to increased
Response to parenteral iron administration.....	very rapid .....	negligible

### IV. IMPROVED PREGNANCY OUTCOME

- A. Neural Tube Defects (NTD's)  
"At Increased Risk" At increased risk
  - 1. Maternal Serum-AFP
    - a. Single fetus:
      - 1. Non-Insulin Dependent Diabetic .....2.3 MoM or greater
      - 2. Insulin Dependent Diabetic .....1.8 MoM or greater
    - b. Twins:



- 1. Non-Insulin Dependent Diabetic .....4.0 MoM or greater
- 2. Insulin Dependent Diabetic .....3.6 MoM or greater
- B. Down Syndrome (DSR)
  - 1. Down Syndrome risk is 1:270 or greater (meaning the numerical risk value is actually less than 270)
- C. Trisomy 18 (T-18)
  - All of the following must be below their cutoffs of:
    - a. AFP .....0.75 MoM
    - b. uE3 .....0.60 MoM
    - c. hCG.....0.55 MoM

**V. COMMON VIRAL AND RICKETTSIAL CLINICAL SYNDROMES**

As a guide to the physician in submitting specimens for viral and rickettsial studies, the following chart has been included. It lists the common clinical syndromes, viruses which have been associated with each, and the clinical materials which should be collected. Every attempt should be made to obtain all of the materials listed for each illness, since this will greatly increase the chances of the laboratory in establishing an etiologic diagnosis.

MANIFESTATION	AGENT	SOURCE OF SPECIMEN	
		CLINICAL	AUTOPSY
A. Cardiovascular 1. Myocarditis and Pericarditis	Enteroviruses: (Including Coxsackie A), (types 4, 14, 16) B-1 - B-5	Throat swab/washing Feces Pericardial fluid	Blood Pericardial Fluid
B. Central Nervous System (CNS) 1. Paralysis	Enteroviruses:	Throat swab/washing	Brain

<b>MANIFESTATION</b>	<b>AGENT</b>	<b>SOURCE OF SPECIMEN</b>	
		<b>CLINICAL</b>	<b>AUTOPSY</b>
2. Aseptic meningitis and/or encephalitis	Polioviruses types 1,2,3 Coxsackie A-7, A-9 ECHO types 2 and 9	CSF Feces	Intestinal contents
	Enteroviruses: Poliovirus Coxsackie Groups A and B ECHO viruses Herpes simplex	Throat swab/washing CSF Feces	Brain Intestinal contents
	Mumps	Mouth swab CSF	Brain
	Arboviruses	Mouth swab of Swenson's ducts CSF Urine	Brain Parotid
	Lymphocytic choriomeningitis	Blood Throat CSF	Brain
	Lymphogranuloma venereum	Blood CSF	Brain
			CSF Primary lesion site
Central Nervous System (CNS) Cont.	Rabies	Mouth swab	Brain Subaxillary glands
	Adenoviruses	Throat swab CSF	Brain

<b>MANIFESTATION</b>	<b>AGENT</b>	<b>SOURCE OF SPECIMEN</b>	
		<b>CLINICAL</b>	<b>AUTOPSY</b>
3. Guillain-Barre´ Syndrome	Measles (Rubeola)  Coxsackie A ECHO viruses	Feces  Blood CSF  Throat swab/washing CSF Feces	Brain  Brain cord
4. Subacute sclerosing Pan encephalitis (Dawson’s encephalitis)	Measles (Rubeola)	CSF Blood	Brain
<b>C. Exanthematous Infection</b> 1. Skin and Mucous Membrane a. Smallpox b. Chickenpox  c. Fever blisters  d. Herpangina  e. Hand, foot and mouth	Vaccinia variola Varicella zoster  Herpes simplex  Enterovirus: Coxsackie A  Enterovirus	Crusts Throat swab/washing Vesicle fluid Scrapings from vesicle base  Mouth swab Vesicle fluid and scrapings  Vesicle fluid Throat swab/washing Feces Vaginal swab  Vesicle fluid	Liver Spleen (Lung also for varicella)  CNS  Feces

<b>MANIFESTATION</b>	<b>AGENT</b>	<b>SOURCE OF SPECIMEN</b>	
		<b>CLINICAL</b>	<b>AUTOPSY</b>
disease  f. Dengue fever  2. Maculopapular Rash a. Enterovirus  b. German measles	Coxsackie A  Dengue virus (types 1-4)  Rubella	Throat swab/washing (types 5, 10, 16)  Blood  Throat swab/washing Feces  Heparinized blood CSF Products of conception Throat swab/washing Urine	(Types 1-4)  Lung Liver Spleen
Exanthematous Infection Cont. c. Measles	Rubeola	Heparinized blood CSF Products of conception Throat swab/washing Urine	Lung Liver Spleen
D. Ocular (Ophthalmic diseases) 1. Kerato-conjunctivitis  2. Ocular Herpes	Adenoviruses (types 8, 19, and 37)  Herpes simplex	Eye swab  Eye swab	Throat swab/washing  CNS

<b>MANIFESTATION</b>	<b>AGENT</b>	<b>SOURCE OF SPECIMEN</b>	
		<b>CLINICAL</b>	<b>AUTOPSY</b>
3. Follicular Conjunctivitis	Adenoviruses (types 3,7, and others)	Eye swab	Throat swab/washing Eye swab
4. Conjunctivitis	New Castle Disease Virus		Conjunctival scrapings
E. Respiratory Infection Lower Tract 1. Bronchitis Laryngotracheo bronchitis (croup)	Influenza Parainfluenza Respiratory syncytial virus (infants)	Nasopharyngeal Aspirate Sputum	Lung Bronchial scrapings (for influenza, add spleen, liver, and/or kidney)
	Chlamydia	Sputum Pleural fluid Throat swab/washing	Lung Liver Spleen
	Adenoviruses	Sputum Nasopharyngeal Aspirate Feces Throat swab/washing	Lung Bronchial scrapings  Intestinal contents
2. Pneumonia	Enteroviruses	Feces	
	RSV Adenoviruses	Throat swab/washing Feces Sputum	Lung
3. Pneumonitis	Coxsackie A infants (types 9, 16)	Throat swab/washing Feces	Intestinal contents
4. Pleurodynia	Coxsackie B (types 1 -6)	Throat swab/washing Feces Pleural effusion	Lung Intestinal contents

<b>MANIFESTATION</b>	<b>AGENT</b>	<b>SOURCE OF SPECIMEN</b>	
		<b>CLINICAL</b>	<b>AUTOPSY</b>
Respiratory Infection (Cont.) Upper Tract	Adenoviruses  Echovirus, Coxsackie - A21 Reovirus Parainfluenza viruses Rhinoviruses	Throat swab/washing Feces	Lung Bronchial scrapings  Intestinal contents
1. Exudative tonsillopharyngitis	Adenoviruses Epstein Barr virus of infectious mononucleosis	Blood Feces Throat swab/washing	
2. Acute lymphonodular pharyngitis	Coxsackie A (type 10)	Throat swab/washing Feces	
3. Pharyngo-conjunctival Fever	Adenoviruses	Throat swab/washing Feces	
4. Herpangis, Stomatitis or all Three	Coxsackie A Herpes simplex	Throat swab/washing Feces	Swab of oral lesions
F. Rickettsial Infections			
1. Rocky Mountain Spotted Fever	Rickettsiae rickettsi	Blood	Liver Spleen
2. Ehrlichiosis	Ehrlichia chaffeensis	Blood	
3. Epidemic typhus	R. Prowazeki	Blood	
4. Murine typhus	R. Typhi	Blood	
5. Q Fever	Coxiella burneti	Sputum Urine	Liver Spleen

<b>MANIFESTATION</b>	<b>AGENT</b>	<b>SOURCE OF SPECIMEN</b>	
		<b>CLINICAL</b>	<b>AUTOPSY</b>
6. Rickettsial pox R. Akari		CSF Blood  Blood	Liver Spleen
<b>G. Sexually transmitted diseases (STD)</b> 1. Acquired Immuno-Deficiency Syndroms (AIDS)  2. Genitourinary tract infection  3. Vulvovaginitis  4. Lymphogranuloma venereum, cervicitis, urethritis	Human Immuno-deficiency virus HIV1, HIV2  Herpes Simplex 2  Coxsackie B Herpes Simplex 2  Chlamydia trachomatis	Heparinized blood  Lesion scraping Vaginal swab  Vaginal swab Lesion scraping  Fluid and pus, cervical swab, urethral swab	
<b>H. Systemic</b>	Cytomegalovirus        Adenoviruses	Urine, Saliva Throat swab/washing Heparinized blood CSF Lung Biopsy  Throat swab/washing Sputum Feces Urine CSF	Kidney Lung Liver Brain    Intestinal contents  Lung Brain Liver

<b>MANIFESTATION</b>	<b>AGENT</b>	<b>SOURCE OF SPECIMEN</b>	
		<b>CLINICAL</b>	<b>AUTOPSY</b>
	Coxsackie B	Throat swab/washing CSF Feces, pleural, or as indicated	Kidney Heart  Brain Heart Lymph node Intestinal
<b>I. Miscellaneous</b> 1. Infantile diarrhea  2. Hepatitis  3. Hemolytic-uremic Syndrome	Coxsackie A Feces (types 18, 20, 21, 22, 24)  Enteroviruses (including Coxsackie A) (types 4,9)  Coxsackie A (type 4)	Throat swab/washing Feces Liver  Throat swab/washing Feces	Intestinal contents   Lung Kidney Intestinal contents
Miscellaneous cont. 4. T cell leukemia  5. Gastroenteritis  6. Orchitis and Epididymitis	HTLV I, II  ECHO Coxsackie B Rotaviruses Norwalk virus  Mumps Coxsackie B	Heparinized blood  Feces Throat swab/washing Vomit  Urine Throat swab/washing Feces	Parotid



<b>MANIFESTATION</b>	<b>AGENT</b>	<b>SOURCE OF SPECIMEN</b>	
		<b>CLINICAL</b>	<b>AUTOPSY</b>
7. Intussuception	Adenoviruses	Feces Mesenteric lymph node	
8. Colorado Tick Fever	CTF virus	Blood	
9. Acute infectious Lymphocytosis	Epstein-Barr virus (EB) Coxsackie-like virus	Blood	
10. Post Perfusion Syndrome	CMV EB	Blood	

**NOTE:** Whenever possible, send "paired sera" for serological testing of the above viruses

## GENERAL ORGANIZATION OF THE LABORATORIES ADMINISTRATION

<b>REGISTRATION and LAB REPORTS SECTION</b> .....	410-767-6116
<b>DIVISION OF and FISCAL SERVICES:</b>	
BILLING OFFICE.....	410-767-6908
PROCUREMENT OFFICE.....	410-767-6103
<b>DIVISION OF ENVIRONMENTAL HEALTH CHEMISTRY:</b>	
DIVISION CHIEF.....	410-767-5838
AIR QUALITY LAB.....	410-767-5948
FOOD LAB.....	410-767-6194
TRACE ORGANICS.....	410-767-4388

INORGANICS SECTION.....	410-767-6180
MULTI-ELEMENT SECTION .....	410-767-6184
OCCUPATIONAL HEALTH.....	410-767-5948
PHARMACEUTICAL CHEMISTRY.....	410-767-6199
RADIATION CHEMISTRY.....	410-767-5537
PESTICIDES SECTION.....	410-767-8185
INORGANIC DRINKING WATER.....	410-767-6192
INORGANIC WASTEWATER.....	410-767-6192
NUTRIENTS LAB .....	410-767-6191

**DIVISION OF ENVIRONMENTAL HEALTH MICROBIOLOGY:**

DIVISION CHIEF.....	410-767-6125
DAIRY BACTERIOLOGY.....	410-767-6146
DAIRY CHEMISTRY.....	410-767-6195
FOOD/SHELLFISH.....	410-767-6149
MEDIA and REAGENTS.....	410-767-6139
WATER BACTERIOLOGY.....	410-767-6145
WATER LAB CERTIFICATION .....	410-767-5074

**DIVISION OF PUBLIC HEALTH MICROBIOLOGY:**

DIVISION CHIEF.....	410-767-6125
CLINICAL MICROBIOLOGY .....	410-767-6135
ENTERIC BACTERIOLOGY.....	410-767-6141
GONORRHEA.....	410-767-6132
MYCOBACTERIOLOGY .....	410-767-6128
MYCOLOGY.....	410-767-6127
PARASITOLOGY .....	410-767-6135

**DIVISION OF MOLECULAR BIOLOGY:**

DIVISION CHIEF ..... 410-767-5772  
HIV VIRAL LOAD..... 410-767-6058  
MOLECULAR IMAGING..... 410-767-5835  
NUCLEIC ACID AMPLIFICATION..... 410-767-5825  
NUCLEOTIDE SEQUENCING..... 410-767-6098  
PULSED- FIELD GEL ELECTROPHORESIS ..... 410-767-6094

**DIVISION OF NEWBORN AND CHILDHOOD LABORATORY SCREENING:**

NEWBORN SCREENING (PKU, HEMOGLOBIN DISORDERS, ETC)..... 410-767-6171  
CHILDHOOD LEAD POISONING SCREENING ..... 410-767-6086

**DIVISION OF VIROLOGY and IMMUNOLOGY:**

DIVISION CHIEF ..... 410-767-6151  
CELLULAR IMMUNOLOGY (FLOW CYTOMETRY) ..... 410-767-6163  
CHLAMYDIA..... 410-767-6154  
HEPATITIS LABORATORY..... 410-767-6169  
MICROBIAL SEROLOGY..... 410-767-6159  
RABIES ZOONOSIS..... 410-767-6177  
RETROVIROLOGY ..... 410-767-6157  
RUBELLA IMMUNOHEMATOLOGY ..... 410-767-6164  
SYPHILIS SEROLOGY..... 410-767-6175  
VIRUS ISOLATION..... 410-767-6153

**DIVISION OF QUALITY ASSURANCE, SAFETY and TRAINING:**

DIVISION CHIEF ..... 410-767-6909  
PROGRAM ADMINISTRATOR ..... 410-767-6909  
QUALITY ASSURANCE OFFICER..... 410-767-6909  
SAFETY OFFICER ..... 410-767-6081  
GLASSWARE PREP ..... 410-767-6119  
SPECIMEN CONTAINER PREP ..... 410-767-6120

## DIRECTORY OF LOCAL HEALTH DEPARTMENTS

<b>Phone No.</b>	<b>Health Department</b>	<b>Address</b>	<b>Fax No.</b>
301-777-5600	ALLEGANY COUNTY	Box 1745 12500 Willowbrook Road, SE Cumberland, MD 21501-1745	301-777-5674
410-222-7095	ANNE ARUNDEL COUNTY	Health Services Buildings 3 Harry S. Truman Parkway Annapolis, MD. 21401	410-222-7294
410-396-4387	BALTIMORE CITY	210 Guilford Avenue, 3rd Fl. Baltimore, MD. 21202	410-396-1571
410-887-3740	BALTIMORE COUNTY	Investment Building 1 Investment Place, 11th Fl. Towson, MD 21204	410-296-0639
410-535-5400	CALVERT COUNTY	P.O. Box 980 Prince Frederick, MD 20678	410-535-5285
410-479-0556	CAROLINE COUNTY	Box 10, 411 Franklin Street Denton, MD 21629	410-479-0554
410-876-2152	CARROLL COUNTY	Box 845, Westminster, MD 21158-0845	410-876-4988
410-996-5550	CECIL COUNTY	John M. Byers Health Center 401 Bow Street Elkton, MD 21921	410-996-5179
301-609-6900	CHARLES COUNTY	4545 Crain Highway, P.O. Box 1050 White Plains, MD 20695-1050	301-609-
410-228-3223	DORCHESTER COUNTY	751 Woods Road Cambridge, MD 21613	410-228-9319
301-694-1029	FREDERICK COUNTY	350 Montevue Lane Frederick, MD 21702	301-631-3111
301-334-1599	GARRETT COUNTY	c/o G.W. Plaza 2008 Maryland Highway	301-334-1014

<b>Phone No.</b>	<b>Health Department</b>	<b>Address</b>	<b>Fax No.</b>
		Mt. Lake Park, MD 21550	
410-838-3047	HARFORD COUNTY	119 Hays Street, Box 797 Bel Air, MD 21014-0797	410-879-6823
410-313-6300	HOWARD COUNTY	6751 Columbia Gateway Drive Columbia, MD 21046	410-313-6303
410-778-1350	KENT COUNTY	Box 359, 125 S. Lynchburg Street Chestertown, MD 21620	410-778-6119
240-777-1349	MONTGOMERY COUNTY	401 Hungerford Drive, 5th Floor Rockville, MD 20850	301-217-1494
301-883-7832	PRINCE GEORGES COUNTY	1701 McCormick Drive Largo, MD 20774	301-883-7896
410-758-0720	QUEEN ANNE'S COUNTY	206 N. Commerce Street Centreville, MD 21617	410-758-2838
301-475-4330	ST. MARY'S COUNTY	Peabody Street, P.O. Box 316 Leonardtown, MD 20650	301-475-4350
410-651-5600	SOMERSET COUNTY	7920 Crisfield Highway Westover, MD 21871	410-651-5680
410-819-5600	TALBOT COUNTY	100 S. Hanson Street Easton, MD 21601	410-819-5690
301-791-3200	WASHINGTON COUNTY	1302 Pennsylvania Avenue P.O. Box 2067 Hagerstown, MD 21742	301-791-3198
410-749-1244	WICOMICO COUNTY	100 East Main Street Salisbury, MD 21801	410-543-6975
410-632-1100	WORCESTER COUNTY	P.O. Box 249 Snow Hill, MD 21863	410-632-0906

**Mental Hygiene (DHMH) are operated on a non-discriminatory basis. This**  
**“ The services and facilities of the Maryland Department of Health and**  
**policy prohibits discrimination on the basis of race, color, sex, or national**  
**origin and applies to the provisions of employment and granting of**  
**advantages, privileges and accommodations. The Department in**  
**compliance with the Americans with Disabilities Act, ensures that**  
**qualified individuals with disabilities are given an opportunity to**  
**participate in and benefit from DHMH services, programs, benefits, and**  
**employment opportunities.”**

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