Mississippi Public Health Laboratory

Guide to Services

Revised March 2023

MISSISSIPPI STATE DEPARTMENT OF HEALTH

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Welcome

Dear Mississippi Public Health Laboratory Customer:

Our laboratory is pleased to provide you with the most recent version of our services guide. We have designed the guide to give you the latest information on all the tests performed by our laboratory. The guide also provides a brief overview of the laboratory organization, contact information, and our procedures for the submission, collection, and handling of specimens. Our guide also includes quick reference charts and diagrams that can be printed to assist you with collecting and submitting specimens. We have included a list of forms for submitting specimens. Thank you for your continued support of our laboratory.

Sincerely,

Daphne Ware, Ph.D.
Director, Mississippi Public Health Laboratory

General Information

Mississippi Public Health Laboratory
570 E. Woodrow Wilson Drive
Jackson, MS 39216
Telephone: 601-576-7582
FAX: 601-576-7720
After Hours and Holidays phone: 601-576-7400

Hours of Operation

Normal business hours are from 8:00 am to 5:00 pm, Monday through Friday.

Holiday Schedule

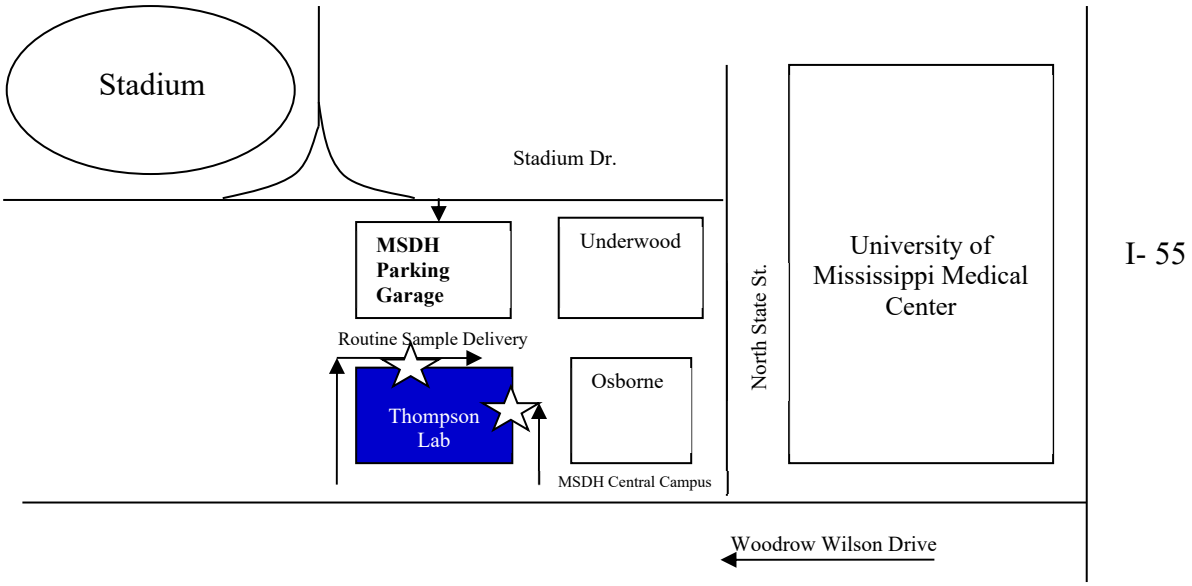
The Mississippi Public Health Laboratory follows Department of Health policy for holiday operation. Please consider this when submitting time-limited specimens, such as milk and water, during holiday periods.

Web Address:

http://msdh.ms.gov/msdhsite/_static/14,0,188.html

Directions to the MPHL

The MPHL is located at the Dr. F.E."ED" Thompson, JR Public Health Laboratory Facility on the MSDH's central office campus in Jackson, MS.



To Visit MPHL:

Take I-55 to the Woodrow Wilson Exit. After passing through North State Street (2nd red light), turn right into the 1st MSDH entrance off of Woodrow Wilson Drive. Immediately after entering the MSDH campus, park in one of the spots labeled as "Visitor". Walk up the left sidewalk that is directly in front of the Thompson Laboratory. Turn and walk up the ramp to the front of the Thompson Building. The Thompson Laboratory entrance is identified with a white star. Additional visitor parking is available on the 1st floor of the parking garage.

Telephone Numbers and Administrative Staff Contact Information

General Laboratory Inquiries	**601-576-7582 Phone** **601-576-7722 Fax**

Administrative Staff Information

Daphne Ware, PhD **Director, Public Health Laboratory** **daphne.ware@msdh.ms.gov**	**601-576-8035 Phone** **601-576-7037 Fax**
Karin Thurman **Director, Administrative Services** **karen.thurmin@msdh.ms.gov**	**601-576-7745 Phone** **601-576-7037 Fax**
Janet Hartin **Director, Environmental Services** **janet.hartin@msdh.ms.gov**	**601-576-7672 Phone** **601-576-7037 Fax**
Lucersia Nichols **Director, Clinical Services** **Lucersia.nichols@msdh.ms.gov**	**601-576-8138 Phone** **601-576-7037 Fax**
Gillian O'Dwyer **Director, Informatics** **gillian.odwyer@msdh.ms.gov**	**601-576- 8043 Phone** **601-576-7037 Fax**
Dana White, **Director, Outreach Services** **dana.white@msdh.ms.gov**	**601-576- 8134 Phone** **601-576-7037 Fax**

After Hours Emergency Number	**601-576-7400 Phone** **Toll-free: 1-866-458-4948**

Laboratory Organization

The Mississippi Public Health Laboratory (MPHL) is organizationally located under the Office of the State Health Officer of the Mississippi State Department of Health (MSDH). The mission of the MPHL is to provide quality environmental and clinical testing services for the diagnosis, prevention and surveillance of infectious and chronic diseases and environmental contaminates to reduce the incidence of illness and death and to improve the quality of life among Mississippians. MPHL testing and support functions are arranged into three different service areas that are under the administration of the laboratory director. Each service area is identified in the table below with associated sections shown beneath.

Administration Services	**Clinical Services**	**Environmental Services**	**Outreach Services**	**Informatics Services**
▪ Logistics ▪ Records and Data Entry	▪ Mycobacteriology ▪ STD/Immunology ▪ Special Microbiology ▪ Chemistry/Hematology ▪ Molecular Diagnostics ▪ Biochemistry ▪ Core Sequencing	▪ Chemistry Organic ▪ Chemistry Inorganic ▪ Environmental Microbiology ▪ Quality Assurance	▪ Lab Training ▪ Terrorism Response Coordination ▪ Lab Safety ▪ Biosafety Outreach	▪ LIMS

Administrative Services

The administrative services area provides laboratory support services that include financial, human resources, and logistical components. This service area is responsible for records management and maintenance of the Laboratory Information Management System (LIMS). This service area manages all funding, purchasing, and billing activities associated with the laboratory.

Clinical Laboratory Services

The clinical services area offers analyses of clinical samples in support of the MSDH program requirements and the agency mission of public health surveillance. In addition to testing clinical samples, the clinical services area also performs testing on food products associated with infectious disease outbreaks and environmental samples associated with suspected bioterrorism events. The MPHL participates in the College of American Pathologists, Wisconsin State Lab of Hygiene, American Association of Bioanalysts, American Proficiency Institute and Centers for Disease Control proficiency testing programs. The MPHL is certified to provide clinical laboratory services by the Center of Medicare and Medicaid Services through compliance with the Clinical Laboratory Improvement Amendments of 1988 (CLIA). All clinical test requests for diagnosis must be authorized by a licensed physician or nurse practitioner and must be submitted by a client approved to submit the requested test. Test orders require the submission of a MPHL test requisition and must include the submitter, patient, and specimen information. When medically indicated, rabies testing of animals is available to all Mississippi residents at no cost by the clinical services section. (See Appendix C for complete information.)

Environmental Laboratory Services

The environmental services area provides comprehensive analyses of drinking water for various chemical and/or physical parameters as well as for the presence of bacteriological agents. Public and private water system samples are submitted through the MSDH Bureau of Public Water Supply. The area also provides bacteriological and chemical analysis for raw milk and dairy products produced within the state. These analyses help verify that Mississippi dairy products are in compliance with state and federal standards.

The environmental services area participates in the Environmental Protection Agency (EPA) Drinking Water Certification Program and the Food and Drug Administration (FDA) Dairy Lab Evaluation Program. The MPHL is a member of the Environmental Response Laboratory Network (ERLN). The ERLN is the Environmental Protection Agency's (EPA) national network of laboratories that can be accessed as needed to support large scale environmental responses.

Outreach Services

The Outreach services area coordinates the state laboratory network and promotes statewide sentinel laboratory communication. The area assists with coordinating biological and chemical laboratory response network activities within the State of Mississippi. This service area assists hospital sentinel laboratories by providing training and support in specimen collection, storage, and shipment, evidence-control measures and recognition of chemical and biological terrorism agents. This area also provides biosafety expertise and is available to assist all clinical laboratories in laboratory biosafety by providing training, risk assessments and mitigation strategies. The outreach services area oversees the MPHL's safety and training programs.

Informatics Services

The Informatics services area supports the automated or electronic transfer of information between the MPHL and clients. This area oversees all Laboratory Information Systems through the development, coordination, implementation and maintenance of existing applications and electronic interfaces. The area also assists clients with LIMS access and performs laboratory data analysis as a part of the laboratory quality assurance process.

Emergency Response Capability

The MPHL has been pro-active in terrorism preparedness since 1999. The laboratory has trained response teams that are available 24/7 to perform chemical and biological agent testing. The MPHL is a member of the Laboratory Response Network Biological (LRN-B) and Laboratory Response Network Chemical (LRN-C). The LRN is an integrated national and international network of laboratories that are able to quickly deploy rapid testing, timely notification and secure messaging of results associated with acts of biological or chemical terrorism and other high priority public health emergencies. The MPHL is designated as a LRN Reference Laboratory for biological and Level 2 chemical threat agents. The laboratory has rapid response molecular testing capabilities to aid law enforcement in identifying specimens that may pose a threat to the citizens of our state.

Quality Assurance

The MPHL has an extensive internal quality assurance program that defines and implements the quality tools required for monitoring and improving the quality of services provided at the laboratory. The quality assurance unit encompasses both clinical and environmental laboratory service functions. The quality assurance program provides the following services: review of federal regulations for guidance and compliance; monitor laboratory performance to assess potential problems and ensure quality laboratory testing; develop, evaluate, and standardize laboratory processes and tools; as well as resolve customer service issues relating to laboratory service. Complaints or suggestions for quality improvement can be made by phone directly to the Quality Assurance Office or in a written format addressed to the attention of the Quality Assurance Office.

Laboratory Service Policy and Limitations

Certain clinical and environmental services are available only to the Department of Health. Some tests are limited to patients in specific health department programs. Other tests are performed on a fee-for-service basis for non-health department sources. Although routine diagnostic testing in all areas cannot be provided outside the health department system, private physicians, hospitals, and laboratories are encouraged to contact the laboratory regarding special cases or emergency matters.

Samples must be submitted through a local health department, physician, water system or other authorized submitter. Private citizens are authorized to submit drinking water samples for metal or microbiology testing for a fee.

The report of results is sent to the authorized submitter of the specimen. Certain results are furnished to MSDH programs for follow-up, compliance or epidemiologic purposes. The patient or their designated personal representative can request a copy of their completed laboratory results. For privacy protection, the laboratory will require proof of identity prior to issuing the test results. This request must be made in writing on form AS0-1, MPHL Patient Request for Release of Completed Laboratory Results, located at

The MPHL, in collaboration with public health officials, reserves the right to withdraw services in the case of misuse or improper specimen submission. The services offered by the MPHL are in accordance with Department of Health policies, licensure requirements, and mission.

Record Retention
The MPHL clinical services retains all test requisitions and patient test results at a minimum for the retention period required to comply with and adhere to the CLIA. The MPHL environmental services retains all sample testing data at a minimum for the retention period required to comply and adhere to the FDA and the EPA. A copy of the original report can be reconstructed including reference ranges, interpretive comments, flags, and footnotes by the MPHL upon request.

Referral of Tests to Another Laboratory
The MPHL forwards tests to other laboratories as a service to its clients. If a specimen is sent to a reference laboratory for initial, follow-up or verification testing by the Mississippi Public Health Laboratory, the sender will be notified that the specimen has been referred. The original result report from the reference laboratory is forwarded or faxed to the sender or the result is reported by the MPHL as a part of the specimen report, with the reference laboratory identified as the testing laboratory. A copy all reports are maintained by the MPHL.

Sample Submission and Shipment
The MSDH operates a state-wide courier system for clinical and environmental sample shipment to the MPHL. The MSDH courier system transports samples from local health departments daily and delivers the samples to the MPHL directly. Samples must be properly collected and packaged in accordance with all Department of Transportation (DOT) regulations prior to delivery to a local Health Department. The local Health Department staff is not responsible for packaging external samples or providing shipping supplies. Refer to Appendix E for shipping guidelines. Please contact your local health department for additional guidance on sample submission to the MPHL through the MSDH courier. Samples from local clients may be dropped off directly at the MPHL. Refer to Appendix Q for delivery instructions.

Obtaining MPHL Services
To set-up a new account, contact the MPHL Administrative Services Director at (601)576-7582. After account set-up, clients will be provided with supply ordering information and test reporting options.

Billing Information
Tests are billed quarterly to all non-MSDH clients through mailed invoices. Full payment is due 45 days from date of invoice for all lab services. Prices for all testing services and supplies are reviewed annually and updated as necessary. Clients will receive notification of all price changes prior to enforcement.

Delivery of Specimens and Samples

State Courier Services: Specimens may be dropped off at a **local MSDH clinic** Monday- Friday (except holidays) for overnight delivery to the MPHL. Contact your local MSDH clinic prior to dropping off a specimen to confirm the clinic's hours of operation. If an alternate MSDH drop-off location is required, contact the MSDH Office of Field Services at 601-576-7951 for assistance. Specimens arriving on weekends are stored appropriately for testing to begin on the following weekday.

Delivery in Person: Monday-Friday, 8am-4:30 pm.
Specimens may be delivered directly to the UPS, FedEx, and private courier: Monday through Friday, 8am-4:30pm.

Environmental samples for agents of Bioterrorism (BT) must be delivered in person by law enforcement agents or MSDH Office of Emergency Preparedness staff. Clinical isolates/specimens are typically delivered by private courier.

MPHL Quick Reference Chart for Specimen Collection

TEST	COLLECTION	STORAGE	FORM NO.
Amoebic Trophozoites	Call Lab— Stool in PVA bottle	Ambient	402 or 1252
Arbovirus Serology	2 mL serum minimum or 1mL CSF (NO polystyrene tubes)	Refrigerated 2-8 ° C	8021 or 1252
Autoclave Sterility Check	Two test ampules supplied by MSDH nursing program	Ambient	363
Bacterial Isolates (*Salmonella, Shigella, E. coli:O157*, *N. meningitidis*, and other isolates)	Bacterial growth on Isolation Media/Tube (MacConkey Broth, or GN Broth for *E.coli* isolates)	Ambient	402 or 1252
Blood Parasites/Malaria	Call Lab—Blood smears & whole blood in EDTA (lavender top) tube	Ambient	402 or 1252
Bottled Water-Source	Water in sterile, lab supplied bottle	Ambient	411
Bottled Water-Product	Retail container or sterile, lab supplied bottle	Ambient	411
Botulism	Call Lab	Ambient	402 or 1252
Brucella species PCR	Whole blood in EDTA (lavender top) tube		402 or 1252
CBC	Minimum 2 mL whole blood in EDTA (lavender top) tube (half full). Ship on cold packs	Refrigerated 2-8 ° C	403
Chlamydia/GC/TV NAAT	GC/Chlamydia/TV Gen-Probe Collection Kit See Appendix G	Ambient	984 or 1252
Cholera	Call Lab		402 or 1252
Clinical Chemistry analytes	Gold top Serum Separator Tube filled, centrifuged	Refrigerated 2-8 ° C	405 or 1252
CRE, CRPA, or CRAB	Bacterial isolates	Ambient	1042
Cryptosporidium, Cyclospora, Microsporidium	Call Lab— stool in parasite bottle with preservative	Ambient	402 or 1252
Culture, Miscellaneous	Culturette	Ambient	402 or 1252
Dairy Water (environmentalists only)	Call Lab-Water in sterile, lab supplied bottle	Ambient	146
Dairy Products (environmentalists only)	Retail Container	Refrigerated 2-8 ° C	430
Diphtheria	Call Lab- swab from throat, nose or skin lesion in Stuart's Transport medium or Strep collection kit (silica gel)	Ambient	402 or 1252
Drinking Water Microbiology	Water in sterile, lab supplied bottle	Ambient	425/427
Drinking Water Fluoride	Water in sterile, lab supplied bottle	Ambient	428
Drinking Water Chemistry	Sampling schedule and containers supplied by Bureau of Public Water Supply	Varies based on analyte	Provided with container

TEST	COLLECTION	STORAGE	FORM NO.
Enteric Culture (Stool Culture)	Stool in Enteric Culture Bottle to fill line only, emulsify	Ambient	402 or 1252
Gastrointestinal Panel	Stool in Carey Blair	Ambient	402 or 1252
hCG (Pregnancy test)	Minimum 3 mL serum or whole blood in plain or SST tube	Ambient	402 or 1252
Hepatitis A Antibodies	Whole blood in plain (red top) or SST Tube	Ambient	402 or 1252
Hepatitis B Antigens-Antibodies	Whole blood in plain (red top) or SST Tube	Ambient	499
Hepatitis C Antibodies	Whole blood in plain (red top) or SST Tube	Ambient	499
HIV (AIDS) Serology	Whole blood in plain (red top) or SST Tube	Ambient	364 or 1252
Ice	Ice in two (2) sterile, lab supplied bottles	Frozen	411
Heterotrophic Plate Count	Water in sterile, lab supplied bottle (ship on cold packs/ice)	Refrigerated 2-8 ° C	427
Influenza, SARS-CoV-2 (RT-PCR)	Nasopharyngeal swab or nasal swab placed in viral transport media. (Ship on cold packs)	Refrigerated 2-8 ° C	930
Lead/Copper in drinking water	Call Laboratory Office Manager to order collection kit	Ambient	478
Lead in Blood	200 uL EDTA whole blood in certified lead-free microtainer or certified lead-free EDTA(tan top) tube at least half full	Ambient	402 or 1252
Measles IgG Antibody	Whole blood in plain (red top) or SST Tube	Ambient	402 or 1252
Measles Virus by RT-PCR	Throat or NP swab; Urine	2-8°C	402 or 1252
Meningitis/Encephalitis Panel	CSF	Refrigerated 2-8 ° C	402 or 1252
Mumps Virus by RT-PCR	Buccal swab	2-8°C	402 or 1252
Mumps IgG Antibodies	Whole blood in plain (red top) or SST Tube	Ambient	402 or 1252
Norovirus (RT-PCR)	Minimum of a quarter size sample of solid stool, 1 mL of liquid stool , stool in Carey Blair medium or 2 mL of vomitus in sterile specimen cup w/ screw-cap lid	2-8°C	402 or 1252
Ova and Cysts (parasitology)	Stool in parasite collection bottle to fill line only, emulsify	Ambient	402 or 1252
Pertussis (PCR) (Whooping Cough)	Polyester or synthetic nasal swab only w/ plastic or metal shaft or nasal wash in sterile tube or in sterile specimen cup w/ screw-cap lid (ship on cold packs)	Ambient	402 or 1252
Pinworm	Perianal Touch Prep prepared as cellulose tape slide	Ambient	402 or 1252
Rabies	See Appendix C	Refrigerated 2-8 ° C	433
Raw Milk (environmentalists only)	Milk in plastic vial	Refrigerated 2-8 ° C	431
Recreational Surface Water	Call lab-Water in sterile, lab supplied Bottle (ship on cold packs/ice)	Ambient	410
Respiratory Viral Panel	Nasopharyngeal swab in Viral Transport Media.	Refrigerated 2-8 ° C	402 or 1252

TEST	COLLECTION	STORAGE	FORM NO.
	(Ship on cold packs)		
RPR/Syphilis confirmation	Minimum half-filled plain(red top) tube	Ambient	450 or 1252
SARS-CoV-2 Molecular Testing	Nasopharyngeal or nasal swab in transport media.	Refrigerated 2-8 ° C	1198
TB EIA (QuantiFERON In-tube) Plus	See Appendix N	Ambient	493
TB Isolate, Reference Culture	Bacterial growth on mycobacterial media	Ambient	416 or 1252
TB Culture (Raw Specimen)	Appropriate specimen in sterile container, See TB specimen source listing, page 52	Ambient or Refrigerated 2-8 ° C	416 or 1252
TB Direct PCR	NALC-NAOH concentrated respiratory sediments in sterile container	Refrigerated 2-8 ° C	416 or 1252
Non-Orthopoxvirus (suspect Monkeypox)	TWO separate dry swabs (either polyester, nylon, or Dacron) per lesion	Refrigerated 2-8 ° C	402 or 1252

An ambient temperature range is between 15° to 27°C (59°-80°F).
A refrigerated temperature range is between 2-8 ° C (35.6°-4 6.4°F).

Clinical Services
Specimen Collection and Submission

Specimen Collection

Review the specimen requirements for the desired test(s). Use only the specimen containers specified and the collection techniques provided by this manual.

- Collection devices and containers must be within the expiration date stated by the manufacturer.
- Samples submitted in leaking containers cannot be tested.
- Collect the appropriate volume of sample required for desired test(s).

Specimen Labeling

All specimens should be labeled at the time of collection with at least 2 patient identifiers that must also appear on the test order or requisition. If a client is participating in electronic test order and reporting (ETOR) with the MPHL, the specimen label must contain the order information as well as two patient identifiers.

1. The patient's name (full last name, then full first name) is always required. The patient's first and last name must be recorded exactly as it appears in the patient chart; do not use nicknames. If a label is used, ensure that it is completely attached to the specimen for accurate identification.
2. The second patient identifier may be one of the following:

- Patient's Date of birth (month/day/year)
- Other unique patient identifier, e.g., hospital or office ID code, file number or Medical Record Number
- Patient's Social Security Number

NOTE: Location-based identifiers are NOT acceptable, e.g., hospital room number or street address.

Each specimen must have a securely affixed label with the following information:

- The patient's name written exactly as it appears on the test requisition (e.g., Doe, Jane)
- A second patient identifier as noted above.

If the label is handwritten, use a ballpoint pen. Do not use a felt tip pen. If glass slides are submitted, use a pencil for labeling the frosted end. Two identifiers are preferred, although patient's name alone is acceptable. When submitting a specimen in a container other than the tube used to draw the sample (e.g., transfer vials), also indicate specimen type on the label (e.g., serum, plasma, urine). When submitting specimens for microbiological testing (e.g., cultures, bacterial antigen, microscopic examination), the nature and anatomic source of the sample and the specific organism(s) to be detected, if any, should be specified.

Printed Labels must be scannable. Please ensure that printed labels are placed on a specimen container in such a way as to allow a label scanner to read the barcode (vertically along the length of the tube). Labels that are too big, are wrinkled, or are used to seal the specimen shut compromise the ability to scan them, which affects the ability to process the specimen properly.

Test Orders

All specimens received by the MPHL must be appropriately labeled and be associated with an electronic test order or a paper requisition that is prepared either by hand or printed as a PDF. At a minimum, all test orders, electronic or through a paper requisition, should contain the following information:

- Adequate patient identification (e.g., name, address, telephone number, medical record number)
- Patient gender
- Patient date of birth, or age
- Name and address of clinic/submitter ordering the test
- Test(s) requested

- Date of specimen collection
- Collection time, if requested
- Source and type of specimen and time of collection, when appropriate
- Additional clinical information, if requested

Specimens that are unlabeled or improperly labeled will be rejected. Specimens received without submitter information will be rejected.

The patient identification information on the specimen and test order must match. Laboratory tests will only be performed if the specimen container is labeled with the correct patient identification information and if the information on the container label exactly matches the requisition.

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Clinical Specimen Shipment

Package each clinical specimen in a separate transport bag containing an absorbent pad, placing the specimen in the ziplock portion of the bag and the requisition, if used as the test order, in the outside pocket. Ensure that the test requisition is placed in the pouch so that the test and patient information is facing outward.
Do not place specimens for multiple tests or multiple patients in the same bag.
Prior to shipment, ensure that all specimen transport bags are securely fastened.

All samples shipped through the MSDH courier system must be placed in an MPHL-supplied shipping container at the Department of Health facility. **See Appendix E for detailed shipping information.**

Note that some laboratory procedures require the approval of the Epidemiology Office or other agency program offices. MSDH representatives may be reached Monday through Friday 8am to 5pm at 601-576-7725 or 601-576-7400 on nights and weekends.

Reporting

The report of testing results is sent to the authorized submitter of the clinical specimen, as designated on the test requisition. Copies of clinical laboratory results may be furnished to another authorized submitter upon request of the initial authorized submitter. Certain results are furnished to public health programs for follow-up or epidemiologic purposes.

Reports are faxed to submitters enrolled in automatic fax reporting or can be accessed and printed daily by approved submitters through the internet via the MPHL clinical services web portal. Reports are mailed daily to submitters that are not enrolled in fax or web-based reporting through the Department of Health courier system or the Postal Service. The MPHL also submits test results to all MSDH clinics electronically using an HL7 message. To set-up electronic reporting, the MPHL will actively work with each client's software vendor and staff to develop an interface solution. The MPHL is committed to industry and regulatory standards for data transmission including HL7, LOINC, and SNOMED. Submitters are notified by the result reporting process of unsatisfactory or rejected samples. Unsatisfactory samples are appropriately discarded and cannot be returned. Submitters will be notified by telephone of any critical test values and corrected test reports. See each individual test description for a list of appropriate critical test values.

Disease Reporting

The MPHL complies with the MSDH Reportable Disease regulation as required in the Mississippi Code of 1972, Section 41-3-1. For a complete listing of reportable diseases, please visit the MSDH website at www.msdh.state.ms.us.

Correcting Reporting Errors

If a reporting error is discovered by the MPHL after results have been mailed or accessed through a result point, the submitter will be notified immediately by telephone of the error and the correct result. A corrected report will be issued that contains the statement "corrected report" and a comment documenting the telephone notification process. If a data entry error is discovered by the MPHL after a report has been mailed or accessed through a result point, the report will be corrected immediately and any potentially affected results will be re-verified to assure that the demographic change did not alter the result and to assure reference ranges are correct. Submitters should immediately notify the laboratory of any observed reporting errors. Submitter-identified errors will be corrected and a corrected report will be released.

Surveillance/Confirmation Specimen Submission

The World Health Organization describes public health surveillance as the continuous, systematic collection, analysis and interpretation of health-related data needed for the planning, implementation, and evaluation of public health practice. Such surveillance can:

- serve as an early warning system for impending public health emergencies;
- document the impact of an intervention, or track progress towards specified goals; and
- monitor and clarify the epidemiology of health problems, to allow priorities to be set and to inform public health policy and strategies.

The Mississippi Public Health Laboratory (MPHL) performs surveillance/confirmation testing to monitor diseases of public health significance. The MPHL uses both conventional and innovative research-based methods to characterize and identify organisms in support of state reportable disease requirements and national surveillance programs. The success of the state's surveillance program is dependent upon our laboratory network for the identification and rapid submission of the requested specimens. Please refer to "Appendix T, the MPHL Surveillance and Reportable Disease Submission Guide" for a summary of all isolates or clinical specimens requested as a part of public health surveillance.

Common Unsatisfactory Clinical Specimen Causes and How to Prevent Rejections

Rejection Statement	How to Prevent
No patient identifier on specimen or No name on specimen	Specimen identifying label or notation is not attached to collection device. Each specimen must be labeled to ensure correct identification of patient/sample. * **Mismatched and missing identifiers are the primary cause for specimen rejection.**
Name (identifier) on specimen does not match request form	Verify that the patient information on the sample container/tube matches the information on the requisition exactly. If possible, allow a coworker to verify that the information on both matches as well. ***Mismatched and missing identifiers are the primary cause for specimen rejection.**
No submitter listed on test requisition	Label test requisition legibly with submitter name and address.
Specimen identification illegible.	Label specimen legibly by writing clearly on the specimen or by applying a label containing patient information that is written or typed clearly.
No specimen received	Be careful to include specimen in transport bag. Verify that transport bag is securely sealed prior to shipment.
Quantity not sufficient	Specimen volume did not meet minimum volume requirements. Check minimum sample requirements before beginning venipuncture. Assure that an adequate sample has been obtained before dismissing the patient. Quantity Not Sufficient (QNS) samples cannot be processed.
Specimen leaked, damaged, or crushed in transit	The specimen was damaged during shipment. Add packing material to secure specimens as needed in shipping container.
Specimen too old when received Or Specimen too old for analysis	MPHL has specific time requirements for tests. Follow all specimen receipt requirements defined in this guide.
Specimen submitted in an expired collection tube/container.	MPHL-specified collection device had exceeded manufacturer expiration date. Obtain in-date collection devices and recollect/resubmit the specimen.
Specimen submitted in the wrong kind of tube or device.	MPHL only accepts specific collection devices for certain tests. Obtain the appropriate collection device and recollect/resubmit the specimen.
Specimen clotted	Clotting may occur at the time of collection; a specimen does not clot as it ages. To avoid clotting of a venous specimen, perform the following: Mix collection device immediately after collection for at least 2 minutes. Ensure that blood comes in contact with the entire inner surface of the tube.

Specimen grossly hemolyzed Or Specimen rejected due to severe hemolysis.	For difficult venipunctures, never use anything smaller than a 21 gauge needle. RBCs are fragile and will burst if too much pressure is applied by small needles. Draw samples by slow, steady pressure. Too much pressure will either burst the RBCs causing the sample to be "hemolyzed" or cause the vein to collapse in on itself and stop the blood flow. Hemolysis is defined as breakage or rupture of the red cell membrane allowing the release of hemoglobin and other cellular fluids into the surrounding fluid.
Specimen not centrifuged correctly	Have a blood tube rack in the phlebotomy area. Blood tubes with gel type separator need to clot in the **upright** position before centrifugation to ensure a good plug is produced prior to transportation. Place tubes upright in racks as they are collected. A more secure and properly positioned gel plug helps keep cellular components i.e. red cells, from washing back into serum while in transit and reduces the number of samples rejected as "not centrifuged correctly".
Specimen Under-filled or Over-Filled	Specimen volume incorrect for test performance. Verify that collection device volume is sufficient for desired test and that collection device is filled to appropriate fill line.
Specimen received at the incorrect temperature condition	Temperature-sensitive specimens delivered to the laboratory are untestable if they were shipped at the wrong temperature or were not packed with enough refrigerant. When packing specimens that need to remain at refrigeration temperatures, please account pack the shipper with enough cold packs to keep the specimens cool for up to 48 hours.

BLOOD COLLECTION TUBES for MPHL TESTING			
Tube Cap Color	**Test Used for**	**Tube Order Information**	**Proper Tube Handling Instructions**
PLAIN (RED) 6.0 mL BD Plastic tube W/Hemogard Closure	RPR, TPPA, HCG, Measles, Mumps, Hepatitis	BD Vacutainer Tube **#367815** 100/BX; 1000/CS	Invert gently 5 times immediately after collection. Contains a clot activator.
Serum Separator Tube(SST) GEL (GOLD) 5.0 mL BD Plastic tube W/Hemogard Closure	Chemistry Tests: Liver Enzymes, Creatinine, BUN, Uric Acid, Lipids, Cholesterol, Triglycerides, HDL	BD Vacutainer Tube **#367986** 100/BX; 1000/CS	Invert gently 5 times immediately after collection. Contains a clot activator. **KEEP VERTICAL until spun.** Avoid further movement to prevent hemolysis. Between 30 minutes and 1 hour, spin for 15 minutes at approximately 3000 RPMs.
SST GEL (STRIPED) 8.5 mL BD Plastic tube W/Hemogard Closure	HIV Screening, Hepatitis	BD Vacutainer Tube **#367988** 100/BX; 1000/CS	Invert gently 5 times immediately after collection. Submit a full tube.
EDTA (PURPLE) 4.0 mL BD Plastic tube W/Hemogard Closure	CBC, Hemoglobin, Hematocrit	BD Vacutainer Tube **#367861** 100/BX; 1000/CS	**Invert gently 8-10 times IMMEDIATELY after collection.** Tube contains EDTA anticoagulant and prevents clotting. Ship CBC, Hemoglobin and Hematocrit on Cold Packs) **DO NOT CENTRIFUGE**
EDTA (PURPLE) MICROTAINER 500uL BD Plastic W/Microgard Closure	Blood Lead Screening, capillary	BD Microtainer Tube **#365974** 50/BX; 200/CS	**Mix gently during collection. Tube contains anticoagulant which prevents clotting. Fill to 500 uL line, do not overfill.**
CERTIFIED LEAD FREE EDTA (TAN) 500uL BD Plastic tube W/Hemogard Closure	Blood Lead Screening, venous	BD Vacutainer Tube **#367855** **Provided by Lab**	EDTA TAN-TOP Venous blood collection tubes for confirmatory blood lead. **MUST BE OBTAINED DIRECTLY FROM THE LABORATORY TO BE CERTIFIED LEAD FREE. USE ONLY FOR LEAD TESTING.**

1. **If it is necessary to re-centrifuge a tube, DO NOT DELAY. The clot is continuing to retract and will expel more serum that has been in contact with the cells for too long if there is a delay in re-centrifuging.**
2. **Do not place labels over expiration dates or remove expiration dates of collection tubes. If the expiration date of a collection tube cannot be verified, the tube will be assumed to be expired and the specimen will be rejected.**

MPHL Order of Draw for Multiple Tube Collections

	Stopper/Closure Color	Laboratory Use	Additives/Inversions at Collection
1	 Gold	Serum Separator Tube (SST®) for serum determinations in chemistry. Contains separator gel and clot activator.	Invert gently 5 times immediately after collection. KEEP TUBE VERTICAL until spun to prevent hemolysis. Between 30 minutes and 1 hour after collection, spin for 30 minutes at approximately 3000 RPMs.
2	 Tiger-top	For serum determinations in serology. Tiger-top Gel Separator Tube (HIV, Hepatitis)	Invert gently 5 times immediately after collection. Submit a full tube.
3	 Red	For serum determinations in serology (RPR, TPPA, HCG, Measles, Mumps, Hepatitis). Tube contains clot activator.	Invert gently 5 times immediately after collection
4	 Tan	For lead determinations. This EDTA tube is certified to contain less than 0.01 µg/mL (ppm) lead. Inversions prevent clotting.	Mix 8 to 10 times immediately after collection to prevent clotting.
5	 Lavender	EDTA tubes for whole-blood hematology determinations. Inversions prevent clotting.	Mix 8 to 10 times immediately after collection to prevent clotting.
6	 QuantiFERON	1 mL whole blood collected in Nil control (gray), TB1 antigen (green), TB2 antigen (yellow cap) and Mitogen control (purple) Tubes are used only for detecting tuberculosis infection only.. Collect in the following order: gray, green, yellow, and purple.	Shake tubes 10 times firmly enough to ensure the entire surface of the tube is coated with blood cells to solubilize the antigen on the tube walls. Tube must be moved to a 37°C ±1°C incubator within 16 hours of collection. Do not centrifuge or refrigerate specimens.

CLINICAL SERVICES
TEST DESCRIPTIONS

A

Amoebic Trophozoites
Form 402 or 1252
Approved Submitters: All
Sample Type: Stool collected in PVA preservative and/or Trichrome stained slide. Please contact the lab for appropriate collection bottle.
Volume/Amount Required: Add stool until PVA rises to fill line.
Collection Guidelines: Completely emulsify the stool using spork attached to lid.
Do not overfill the bottle. Fill to the fill line.
Storage Instructions: Ambient temperature
Shipping Requirements: Current shipping guidelines for biological substances, Appendix E.
Test Method: Trichrome stain
Test Availability: Monday-Friday
Limitations: The ability to detect parasites is limited by the quality of the specimen collection. A single negative specimen does not rule out parasitic infection.
Reference Value: Normally Negative
Turnaround time: 1-5 business days
Critical organism identification will be phoned to Health Care Providers immediately.

Anemia Screen :see Hemoglobin and Hematocrit

Arbovirus IgM antibody Screening for West Nile, LaCrosse, St. Louis Encephalitis Virus, and Eastern Equine Encephalitis Viruses.
Form 8021 or 1252
West Nile Virus antibody screening is performed on all submissions. LaCrosse antibody screening is automatically performed for patients under 25 years old. St. Louis Encephalitis Virus (SLE), and Eastern Equine Encephalitis (EEE) IgM antibody screening is performed as recommended by Office of Epidemiology.
Approved Submitters: All
Sample Requirements: 2mL Serum or 2mL CSF
Collection Guidelines: Serum samples should be collected at least 7 days post onset of symptoms. Samples testing negative and collected sooner should be recollected.
Storage instructions: Do not freeze. CSF samples may be stored at 2-8 degrees C (in the refrigerator) for indefinite periods in tightly capped glass or polypropylene tubes. Do not store in polystyrene. Some CSF collection kits have polystyrene containers. If CSF is collected into polystyrene, aliquot into glass or polypropylene for storage and shipping. Once serum has been separated from red cells, it may be stored at 2-8 degrees C for indefinite periods. Do not store in polystyrene. Serum should be collected in tubes with gel separator. Free hemoglobin causes false positive test results. All samples with visible hemolysis will be rejected. DO NOT FREEZE.
Shipping Requirements: Current shipping guidelines for biological substances, Appendix E.
Additional Test Information:

- Testing may be performed on serum or CSF or both. However, serum is the specimen of choice. Antibody levels in CSF tend to be lower.
- Request must include travel history, date of onset and date of collection. Travel history is mandatory for determining which antigens to test. All samples must be accompanied by a completed MSDH Form # 8021.

Test Method: Enzyme Immunoassay (EIA)
Test Availability: Monday-Friday
Limitations: Cross-reactivity between St. Louis Encephalitis Virus and West Nile Virus is common. Generally, primary responders exhibit mainly monotypic antibody responses; however, during successive infections, the antibody response broadens to include heterotypic reactivity to other flaviviruses in the same or different antigenic groups. Results from immunosuppressed patients must be interpreted with caution.
Test Specific Causes for Rejection: West Nile: Specimen grossly hemolyzed or lipemic; **St. Louis Encephalitis (SLE); LaCrosse (LAC), and Eastern Equine Encephalitis (EEE):** Specimen grossly hemolyzed.
Reference Value: Normally Non-Reactive
Turnaround time: 10 business days. Testing may be delayed in winter months when demand is lower.

Arbovirus (Zika, Dengue, Chikungunya) IgM Antibody Testing

Approved Submitters: Office of Epidemiology approval required prior to submittal.
Sample Type: Serum and CSF. CSF MUST be submitted with a patient-matched serum specimen.
Volume/Amount Required: 2mL serum; 2mL CSF
Collection Guidelines: Collect whole blood in serum separator tube (SST) or plain red top tube. SST is the preferred specimen collection device. Collect CSF in a sterile container.
Storage Instructions: Store all specimens at 4°C. Ship on cold pack within 24 to 72 hours.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier. Specimens must be received within 24 hours of collection.
Test Method: Enzyme Immunoassay (EIA)
Test Availability: Monday-Friday
Limitations: IgM antibodies against Zika virus, dengue viruses, and other flaviviruses (e.g., yellow fever virus, West Nile virus) can cross-react possibly generating false positive results in serological tests; therefore, all IgM positive samples will be referred to the CDC for plaque-reduction neutralization testing to discriminate among these viruses.
Results of this test cannot be used as the sole basis of patient management decisions and must be combined with clinical observations, patient history, epidemiological information, and other laboratory evidence. Zika IgM levels over the course of illness are not well characterized. IgM levels are variable, but generally are positive starting near day four post onset of symptoms and continuing for 12 or more weeks following initial infection.
Negative results do not preclude the possibility of Zika virus infection, past or present. Negative results may be seen in specimens collected before day four post onset of symptoms or after the window of detectable IgM closes.
Test Specific Causes for Rejection: Specimen received at room temperature. A CSF specimen received without a complimentary serum specimen.
Reference Value: Normally Non-Reactive
Turnaround time: 5 to 10 business days

Arbovirus (Zika Dengue, and Chickungunya Virus) RNA by RT-PCR

Zika Virus Test Requisition Form

Approved Submitters: Office of Epidemiology approval required prior to submittal
Sample Type: Serum, whole blood and urine MUST be submitted on all patients. CSF and amniotic fluid may also be submitted in conjunction with serum, whole blood and urine specimens.
Collection Guidelines:

- Collect a minimum of 2mL of serum, 2mL whole blood and 1mL of urine from symptomatic patients < 14 days post onset of symptoms or from asymptomatic pregnant women < 14 days after return from travel or exposure.
- 2mL of CSF or amniotic fluid may also be submitted in conjunction with above three specimen types for symptomatic patients.

Required Specimens:
Urine: Always obtain a urine first. Collect urine in a sterile container. Urine specimen cups leak and are not recommended for shipping. To avoid leakage of the urine sample, transfer the urine to a small sterile screw-cap tube (e.g., 15mL conical tube) and use parafilm to seal.
Serum: Collect serum in a red top or marble-top (serum separator) Vacutainer type tube. If using a SST, promptly separate (centrifuge) serum from cells. Store the SST tube refrigerated. If using a red top, centrifuge and transfer the serum to a screw cap sterile tube. Store the serum refrigerated. Submit 2-5 mL of serum transported with a cold pack.
Whole Blood: Collect whole blood in a EDTA tube.
Optional Specimens:
CSF: If CSF is obtained, collect > 1mL of CSF in a tube with NO anticoagulant or preservative. Transport with a cold pack**.** A serum, urine and whole blood specimen must be submitted along with the CSF.
Amniotic fluid: Collect fluid in a sterile container. Urine specimen cups leak and are not recommended for shipping. To avoid leakage of the urine sample, transfer the urine to a small sterile screw-cap tube (e.g., 15mL conical tube) and use parafilm to seal.
Storage Requirements: Store samples refrigerated until transport. Ship specimens on cold packs.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier.
Label the package to the attention of Molecular Diagnostics.
Additional Test Information: Real-Time PCR testing for Zika Virus, Chikungunya Virus, and Dengue Virus by the CDC Trioplex rRT-PCR Assay, verified for use under Emergency Use Authorization by the FDA.
Test Method: Reverse Transcription Polymerase Chain Reaction (RT-PCR)
Test Availability: Monday-Friday. With notification Saturday and Sunday testing is available.
Limitations: Reliable results are dependent on appropriate specimen collection and transport procedures.
Reference Value: Normally Not Detected
Turnaround time: **3** business days

ALT: see Chemistry Panel

B

Bacillus anthracis

Form 1251
Approved Submitters: MS Sentinel Laboratories, Law Enforcement, MSDH Office of Emergency Preparedness and Response
Sample Type: Clinical Specimens- aseptically collected lesions or eschar aspirates, whole blood in EDTA, serum, plasma, tissue, tissue biopsies in screw-capped tube (with or without swab used to collect sample), stool or rectal swab(s), sputum, pleural fluid, and transtracheal aspirates or washes.
Culture- pure growing culture isolate on an appropriate agar slant in a screw capped tube; blood culture isolate.

Environmental samples as submitted by law enforcement personnel.
Volume/Amount Required: Stool should be equal to or greater than 5 grams (pecan size). Sputum volume must equal at least 1mL. Whole blood, plasma, serum, pleural fluid, and aspirates/washes volume must equal at least 0.5mL.
Collection Guidelines:

For vesicular fluid or eschar material	Unroof vesicle and aspirate fluid or collect with two sterile swabs (dacron). Insert swab (dacron) beneath the edge of the eschar, rotate swab or obtain an aspirate. Transport specimens at room temperature.
For tissue	Tissue pieces should be collected and kept moist. Transport in sterile container at room temperature within 1 hour of collection.
Whole blood	(PCR only) Allow any size EDTA (lavender top) tube to completely fill.

Shipping Requirements: Ship all clinical specimens on cold packs within 24 hours of collection using current shipping guidelines for biological substances, Appendix E. Ship all isolates at room temperature using current shipping guidelines for biological substances, Appendix E.
Additional Test Information: Notify MPHL Bioterrorism Coordinator or MPHL Special Microbiology Section at 601-576-7400 prior to submission.
Test Method: Conventional culture and Polymerase Chain Reaction (PCR)
Test Availability: Tested Monday-Friday. With notification, Saturday and Sunday testing available.
Limitations: PCR: If inhibitors are present in a DNA extraction, PCR assays may produce a false negative result. A false negative result may occur if a sample is improperly collected, transported or handled. False negative results may occur if inadequate numbers of organisms are present in the sample. Conventional Culture and Biochemicals: Organism must be viable for testing.
Reference Value: Normally Not Detected
Turnaround time: A preliminary report is available within 24 hours. A final report is available within 10 days.
Critical Test Value: All test results are reported to submitter.

See Appendix E for more shipping information

Bilirubin, total: see Chemistry Panel

Bordetella species (*B. pertussis, parapertussis*, and *holmesii*) PCR

Form 402 or 1252
Approved Submitters: All
Sample Type: A dry nasopharyngeal swab with a synthetic tip and a metal or plastic shaft in a sterile 15mL conical tube/urine cup without transport media or 0.5 mL of a nasal wash.
Collection Guidelines:

- Swabs with calcium alginate or cotton tips and wooden shafts are **NOT** acceptable.
- For best results, collect specimens prior to beginning antibiotic regimen.
- **See Appendix J for complete instructions.**

Storage Requirements: Specimen should be immediately refrigerated at 2°-8°C
Shipping Requirements: Shipped on ice packs within 24 hours following current shipping guidelines for biological substances, Appendix E.

Additional Test Information: PCR has optimal sensitivity during the first 3 weeks of cough when bacterial DNA is still present in the nasopharynx. After the fourth week of cough, the amount of bacterial DNA rapidly diminishes which increases the risk of obtaining falsely-negative results.
Test Method: Polymerase Chain Reaction (PCR)
Test Availability: Monday-Friday
Limitations: PCR testing following antibiotic therapy can result in falsely-negative findings. The exact duration of positivity following antibiotic use is not well understood, but PCR testing after 5 days of antibiotic use is unlikely to be of benefit and is generally not recommended.
Test Specific Causes for Rejection: Improper shipping conditions; swab with calcium alginate or cotton tips and wooden shafts used for collection.
Reference Value: Normally Not Detected
Turnaround time: 3 business days
Critical Test Value: All positives phoned to Health Care Providers immediately.

See Appendix H for complete collection instructions

Brucella species

Form 1251
Approved Submitters: MS Sentinel Laboratories, Law Enforcement, MSDH Office of Emergency Preparedness and Response.
Sample Type: Clinical Specimens: EDTA whole blood, serum, tissue (spleen, liver), joint fluid, abscesses, exudates.
Culture: pure growing culture isolate on an appropriate agar slant in a screw capped tube, bone marrow culture, blood culture.
Environmental samples submitted by law enforcement personnel.
Volume/Amount Required: 1 mL fluid, 0.5 mL blood, and 0.1 gram tissue.
Collection Guidelines: For whole blood, allow any size EDTA (lavender top) tube to completely fill, half full minimum. Tissue pieces (at least the size of a pea) should be collected and kept moist for transport in sterile container at room temperature.
Storage Instructions: Clinical specimens should be stored at 2-8°C. Isolates and environmental samples should be stored at room temperature.
Shipping Requirements: Ship all clinical specimens on cold packs within 24 hours of collection using current shipping guidelines for biological substances, Appendix E. Ship all isolates at room temperature using current shipping guidelines for biological substances, Appendix E.
Additional Test Information: Notify MPHL Bioterrorism Coordinator or MPHL Special Microbiology Section at 601-576-7400 prior to submission.
Test Method: Conventional Culture and Polymerase Chain Reaction (PCR)
Test Availability: Tested Monday-Friday. With notification, Saturday and Sunday testing available.
Limitations: PCR: If inhibitors are present in a DNA extraction, PCR assays may produce a false negative result. A false negative result may occur if a sample is improperly collected, transported or handled. False negative results may occur if inadequate numbers of organisms are present in the sample. Conventional Culture and Biochemicals: Organism must be viable for testing.
Reference Value: Normally Not Detected
Turnaround time: A preliminary report is available within 24 hours. A final report is available within 10 days.
Critical Test Value: All test results are reported to submitter.

See Appendix E for more shipping information

Burkholderia mallei/pseudomallei species

Form 1251
Approved Submitters: MS Sentinel Laboratories, Law Enforcement, MSDH Office of Emergency Preparedness and Response.
Sample Type: Clinical Specimens: EDTA whole blood, serum, sputum, bronchial aspirates, abscess material, wound swabs, urine.
Culture: pure growing culture isolate on an appropriate agar slant in a screw capped tube, bone marrow culture, blood culture.
Environmental samples submitted by law enforcement personnel.
Volume/Amount Required: 1 mL fluids, 0.5 mL blood, and 0.1 gram tissue.
Collection Guidelines: For whole blood, allow any size EDTA (lavender top) tube to completely fill, half full minimum. Tissue pieces (at least the size of a pea) should be collected and kept moist for transport in sterile container at room temperature.
Storage Instructions: Clinical specimens should be stored at 2-8°C. Isolates and environmental samples should be stored at room temperature.
Shipping Requirements: Ship all clinical specimens on cold packs within 24 hours of collection using current shipping guidelines for biological substances, Appendix E. Ship all isolates at room temperature using current shipping guidelines for biological substances, Appendix E.
Additional Test Information: Notify MPHL Bioterrorism Coordinator or MPHL Special Microbiology Section at 601-576-7400 prior to submission.
Test Method: Conventional Culture and Polymerase Chain Reaction (PCR).
Test Availability: Tested Monday-Friday. With notification, Saturday and Sunday
Limitations: PCR: If inhibitors are present in a DNA extraction, PCR assays may produce a false negative result. A false negative result may occur if a sample is improperly collected, transported or handled. False negative results may occur if inadequate numbers of organisms are present in the sample. Conventional Culture and Biochemicals: Organism must be viable for testing.
Reference Value: Normally Not Detected
Turnaround time: A preliminary report is available within 24 hours. A final report is available within 10 days.
Critical Test Value: All test results are reported to submitter.

See Appendix E for more shipping information

BUN: see Chemistry Panel

C

Campylobacter see Enteric Culture

Carbapenem-resistant *Enterobacterale*s (CRE), *Pseudomonas aeruginosa* (CRPA) or *Acinetobacter baumannii* (CRAB)

Form 1042
Approved Submitters: All
Sample Types:

CRE $^{+}$	All isolates of ***Escherichia coli*, *Klebsiella oxytoca*, *Klebsiella pneumoniae*, *Enterobacter* spp, *Providenicia*, *Proteus**, *Morganella**, *Citrobacter* and *Serratia*** from any specimen source that are resistant to any carbapenem antibiotic following current CLSI M100 guidelines and/or identified as a carbapenemase-producer.
CRPA^{+}	All non-mucoid* isolates that are resistant to any carbapenem antibiotic following current CLSI M100 guidelines and/or identified as a carbapenemase-producer. Additionally, any CRPA isolates that are non-susceptible to all antibiotics tested (pan-nonsusceptible). *Non-mucoid isolates are preferred due to an increased tendency for drug resistance in mucoid isolates.
CRAB $^{+}$	All isolates that are resistant to any carbapenem antibiotic following current CLSI M100 guidelines

Volume/Amount Required: bacterial isolates

Collection Guidelines: All isolates must be pure, low passage isolates submitted on a non-inhibitory, non-selective agarplate or slant. Only 1 isolate per patient from the same source will be accepted unless approved by the Office of Epidemiology.
Storage Instructions: Ambient temperature
Shipping Requirements: Current shipping guidelines for biological substances, Appendix E.
Test Methods: MALDI-TOF mass spectrometry, Modified Carbapenem Inactivation Method (mCIM), PCR, Disc Diffusion Antimicrobial susceptibility testing.
Test Availability: Monday-Friday
Limitations: Molecular methods do not detect all know carbapenemase genes.
Reference Value: Normally Negative
Turnaround time: 1-14 business days
Results are reported to the submitting institutions within 48 hours of their completion. Results are also reported to the HAI coordinator of the Office of Epidemiology. Any results requiring immediate public health action are reported to the HAI coordinator and to the CDC within 24 hours. Actionable results include:
1. Suspected Novel carbapenemase. Includes CRE or CRPA positive for carbapenemase production by phenotypic methods and negative by PCR to KPC, NDM-1, OXA-48-like, IMP and VIM. This does not include Serratia spp. resistance to carbapenems and susceptible to 3rd generation cephalosporins or isolates that are susceptible to cefepime.
2. Non-KPC carbapenemase in Enterobacterales.
3. Carbapenemase-producing Pseudomonas aeruginosa, i.e. isolates that test positive for carbapenemase production and/or positive by PCR for KPC, NDM-1, OXA-48-like, or VIM..

Chemical Terrorism Agents

Form 402
Approved Submitters: Approval must be received from the Office of Epidemiology at 601-576-7400.
For Sample Type, Collection Guidelines, Storage Requirements and Documentation Requirements visit https://www.msdh.ms.gov/msdhsite/_static/14,0,188,617.html

The PHL has the capacity to analyze certain clinical samples for specific chemical terrorism agents. These include :

Trace metals in blood and urine by ICP-MS
Toxic Elements in blood and urine-ICP/DRC/MS
Cyanide in blood by GC-MS
Volatile Organic Compounds (VOC) in blood by GC-MS
Tetramine in urine by GC-MS
Organophosphate Nerve Agent (OPNA) metabolites in urine by LC/MS/MS
Abrine/ricinine in urine by LC/MS/MS
HNPAA (Tetranitromethanes) in urine by LC/MS/MS

Additional Test information

Prepare, maintain and send chain of custody forms. Prior to submitting chemical samples for laboratory testing, contact the Chemical Terrorism Coordinator, or the Biochemistry Section Director at 601-576-7400.

Test Specific Causes for Rejection:

- **Tetramine, HNPAA, OPNA, and Abrine/Ricine**: Specimen not stored at -20°C; urine specimen contains visible blood or contamination.
- **Cyanide**: Failure to maintain specimen at refrigerated temperatures (4-8°C); Specimen frozen; Specimen clotted.

Test Availability: Tested Monday-Friday. With notification Saturday and Sunday testing is available.

See Appendix D for more shipping information

Chemistry Panel

Tests available: BUN, Creatinine, Uric Acid, AST (SGOT), ALT (SGPT), Total Bilirubin, Total Cholesterol, HDL Cholesterol, Triglycerides, calculated LDL Cholesterol and Glucose.

Approved Submitters: MSDH facilities

Sample Type: Serum

Volume/Amount Required: 3 mL minimum

Collection Guidelines: Collect serum in a gold topped SST (gel-separator) tube. Immediately invert gently 5 times. Keep tube in vertical position until centrifugation step. Centrifuge at 3000 RPMs for 15 minutes between 30 minutes and 2 hours after collection.

Storage Instructions: Specimens must be received within 5 days of collection. Submit samples as soon as possible after collection. Refrigerate specimens until shipment.

Shipping Requirements: Ship specimen with a cold pack in a rigid leak-proof container (cooler or Styrofoam box only).

Test Methods: Automated chemistry analyzer.

Test Availability: Monday-Friday

Test Specific Causes for Rejection: Na, K, Cl – Blood collection tube not centrifuged; blood collection tube centrifuged incorrectly resulting in too many red cells remaining above the gel plug; hemolysis (invalidates the potassium result); specimen not received within 1 week ; Bun, Creatinine, Uric Acid, Total Bilirubin, Total Cholesterol, HDL Cholesterol, Triglycerides, ALT: Blood collection tube not centrifuged; blood collection tube centrifuged incorrectly resulting in too many red cells remaining above the gel plug; specimen not received within 96 hrs; hemolysis.

Reference Ranges:

BUN	Males: 9-20 mg/dL Females 7-17 mg/dL

Creatinine	Males: 0.66-1.25 mg/dL Females: 0.52-1.04 mg/dL
Uric Acid	Males: 3.5-8.5 mg/dL Females: 2.5-6.2mg/dL
AST	Males: 17-59 U/L Females: 14-36 U/L
ALT	Males: 21--72 U/L Females: 9-52 U/L
Total Bilirubin	0.2 - 1.3 mg/dl
HDL Cholesterol	40-60 mg/dL
Triglycerides	Less than 150 mg/dL
Calculated LDL Cholesterol	Less than 100 mg/dL
Fasting glucose	74-106 mg/dL
Random or casual glucose (CPG)	Less than140mg/dL

Turnaround time: 3 to 5 business days
Critical Test Values: The following results are phoned to Health Care Providers immediately:

Total Bilirubin greater than 3.0 mg/dL
BUN greater than 50 mg/dL
Creatinine greater than 2.5 mg/dL

Chikungunya Virus: see Arbovirus IgM Antibody Testing and Arbovirus RNA Virus detection by RT-PCR

Chlamydia trachomatis (CT) / *Neisseria gonorrhoeae (NG)* / *Trichomonas vaginalis (TV)* Nucleic Acid Amplification Test (NAAT)

Form 984 or 1252

Approved Submitters: MSDH facilities

Sample Type: Specimens for CT/NG may be of oral, cervical, vaginal, rectal, or urethral origin. TV testing is not available for specimens of oral or rectal origin. Specimens must be either urine collected using a Hologic Aptima Urine Specimen Collection Kit for Male and Female Urine Specimens or a swab collected using a Hologic Aptima Multitest Swab Specimen Collection Kit. NOTE: Different MPHL-provided collection and transport kits are required for each collection site.

Volume/Amount Required: Transfer urine into the Gen-Probe Urine Specimen Transport Tube until volume is between black fill lines on device. Place swab into Gen-Probe Swab Transport tube and break swab shaft at the score line.
Collection Guidelines: See Appendix G for detailed instructions.
Storage Instructions: Samples in transport tubes may be kept at room temperature for up to 30 days. Samples must be shipped at room temperature.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier.
Test Method: NAAT (Aptima Combo 2 for CT/NG or Aptima Combo 2 for CT/GC/TV).
Test Availability: Monday-Friday
Limitations: Results from the NAAT are not intended for the evaluation of medico-legal cases. Reliable results are dependent on adequate specimen collection. Theraputic failure or success cannot be determined with the NAAT because nucleic acids may persist following appropriate antimicrobial therapy.
Test Specific Causes for Rejection: Specimen transported refrigerated or frozen; inappropriate specimen collection kit used for identified site/source; no swab in tube or 2 swabs submitted in the same specimen transport tube; cleaning swab submitted in specimen transport tube; insufficient amount of urine in specimen collection tube (should not be above or below fill lines); specimen collected for medico-legal purposes.
Reference Value: Normally Negative
Turnaround time: 5 to 10 business days

See Appendix F for complete collection instructions.

Cholera and Non-Cholera *Vibrio*

Form 402 or 1252
Approved Submitters: All
Sample Type: Stool in Cary-Blair transport media, bacterial isolates.
Volume/Amount Required: Fill transport bottle to fill line for stool Do not overfill the bottle.
Collection Guidelines: Completely emulsify the stool using spork attached to lid.
Storage Instructions: Ambient temperature.
Shipping Requirements: Current shipping guidelines for biological substances, Appendix E.
Test Method: Conventional culture and biochemicals.
Test Availability: Monday-Friday
Limitations: Culture must be viable.
Reference Value: Normally Negative
Turnaround time: Bacterial isolation, typing and identification can take up to 21 days.
Critical Test Value: All results are phoned to Health Care Providers immediately.

Cholesterol, total, LDL and HDL: see Chemistry Panel

Complete Blood Count (CBC)

Approved Submitters: MSDH facilities
Sample Type: EDTA whole blood
Volume/Amount Required: Allow any size lavender top tube to completely fill, minimum half full. 2 mL whole blood required for analysis.
Collection Guidelines: Immediately invert gently 8-10 times after collection. Do not collect specimens on Friday for Saturday delivery.

Storage Instructions: Specimens must be received by the laboratory within 24 hours of collection. Refrigerate if possible until shipment.

Shipping Requirements: Specimens must be shipped on cold packs. Specimens should not be placed in direct contact with the cold packs as this may affect specimen integrity. Blood tube should be wrapped or separated from the cold packs with multiple layers of paper towels, absorbent paper or padded envelopes. Follow current shipping instructions for MSDH Contract Courier using cold packs in a rigid outer container (Styrofoam box or cooler); Do not ship specimens in an envelope to avoid damage and leakage issues during transit.

Additional Test Information: CBC without WBC differential includes total WBC and Platelet count. If a CBC with WBC differential is ordered, an automated differential is performed initially. Additional manual assessments of stained smears are performed if results meet specific instrument flagging criteria. Smear review includes assessment of WBC cell populations, presence of WBC and/or RBC inclusions, RBC morphology, and platelet evaluation.

Test Method: Electronic impedance

Test Availability: Tuesday-Friday. Do not collect on Friday for Saturday delivery.

Limitations: CBC parameters may be affected by the length of time between specimen collection and test performance.

Test Specific Causes for Rejection: Specimen hemolyzed; Specimen not received within 24 hrs of collection; specimen clotted; specimen received at room temperature.

Reference Ranges:

	1-30 days of age	2-12 months of age	13-23 months of age	2-9 years of age	10-18 years of age		>18 years of age/Adult	
					Male	Female	Male	Female
White Blood Cells	5.0 - 21.0	6.0 - 17.5	6.0 - 14.0	4.0 - 12.0	4.1 - 9.3			
Red Blood Cells	3.90 - 6.40	3.30 - 5.30			4.20-5.60	4.10-5.30	4.52-5.90	4.10-5.10
Hemoglobin	13.4 - 19.9	11.0 - 14.0			12.5-16.1	12.0-15.0	14.0-17.5	12.3-15.3
Hematocrit	42.0 - 65.0	33.0 - 43.0			36.0-47.0	35.0-45.0	41.5-50.4	35.9-44.6
mean corpuscular volume (MCV)	85.0 - 123.0	72.0 - 84.0		76.0 - 90.0	77.8 - 96.8			
mean corpuscular hemoglobin (MCH)	28.0 - 40.0	24.0 - 30.0		25.0 - 32.0	25.9 - 34.2			
mean corpuscular hemoglobin concentration (MCHC)	32.6 - 35.7							
Platelets	150 - 600				150 - 475		173 - 402	

	1-30 days of age	2-12 months of age	13-23 months of age	2-9 years of age	10-18 years of age	>18 years of age/Adult
Red cell distribution width (RDW)	13.0 - 18.0	11.5 - 16.0	11.5 - 15.0			11.4 – 14.4

Mean platelet volume (MPV).	7.4 – 10.3		
Neutrophil %	15.0 – 35.0	25.0 – 45.0	41.4 – 72.6
Neutrophil #	0.8 - 8.0	1.5 – 8.5	2.2 – 6.4
Lymphocyte%	46.0 – 76.0	36.0 – 65.0	17.4 – 45.4
Lymphocyte #	4.0 – 10.5	3.0 – 9.0	1.1 – 2.9
Monocytes %	4.5-13.5		
Monocytes #	0.2 - 0.8		
Eosinophil %	0.5 - 9.5		
Eosinophil #	0.0 0.7		
Basophil %	0.0 – 1.1		
Basophil #	0.0 – 0.1		

Turnaround time: 3 business days
Critical Test Value: The following test results are phoned to Health Care Providers immediately: Hemoglobin less than 6.0 and greater than 20.0 mg/dL; Platelet count less than 50,000/dL.
WBC less than 2,000/µL and greater than 25,000/ul; nucleated RBC, sickle cells, immature or abnormal cells on differential count.

Core Antibody: see Hepatitis B Core Antibody

Coxiella burnetii

Form 1251
Approved Submitters: MS Sentinel Laboratories, Law Enforcement, MSDH Office of Emergency Preparedness and Response.
Sample Type: Clinical Specimens: EDTA whole blood, serum.
Environmental samples submitted by law enforcement personnel.
Volume/Amount Required: 0.5 mL blood
Collection Guidelines: Collect blood in EDTA (lavender) or sodium citrate (blue) and maintain at 4°C for storage and shipping.
Storage Instructions: Clinical specimens should be stored at 2-8°C.
Shipping Requirements: Ship all clinical specimens on cold packs within 24 hours of collection using current shipping guidelines for biological substances, Appendix E.
*Label the package to the attention of Molecular Diagnostics.
Test Method: Polymerase Chain Reaction (PCR)
Additional Test Information: Notify MPHL Bioterrorism Coordinator or MPHL Special Microbiology Section at 601-576-7400 prior to submission. Due to the extreme infectivity of *C. burnetii*, Level A (Sentinel) laboratories should not attempt to culture this organism.
Test Availability: Tested Monday-Friday. With notification, Saturday and Sunday testing available.
Limitations: PCR: If inhibitors are present in a DNA extraction, PCR assays may produce a false negative result. A false negative result may occur if a sample is improperly collected, transported or handled. False negative results may occur if inadequate numbers of organisms are present in the sample.
Reference Value: Normally Not Detected
Turnaround time: 24 hours. A preliminary report is available within 24 hours. A final report is available within 10 days.
Critical Test Value: All test results are reported to submitter.

See Appendix E for more shipping information

Creatinine: see Chemistry Panel

Cryptosporidium, *Cyclospora*, *Microsporidium*, *and Isospora*

Form 402 or 1252
Approved Submitters: Performed only on special request. Please contact the lab before sending.
Sample Type: Stool in 10% formalin
Volume/Amount Required: Add stool exactly to fill line. Do not overfill the bottle.
Collection Guidelines: Submit in formalin transport bottle obtained from the laboratory; completely emulsify the stool using spork attached to lid.
Storage Instructions: Ambient temperature
Shipping Requirements: Current shipping guidelines for biological substances, Appendix E.
Additional Test Information: Please contact the lab for collection bottle and instructions.
Test Methods: Biochemical staining and microscopy.
Test Availability: Monday-Friday
Limitations: The ability to detect parasites is limited by the quality of the specimen collection. A single negative specimen does not rule out parasitic infection.
Test Specific Causes for Rejection: Specimen bottle over or under filled; Stool not emulsified.
Reference Value: Normally Negative
Turnaround time: 5 days, longer if referred to CDC
Critical Test Value: All positives phoned to Health Care Providers immediately.

Cultures (eye, ear, superficial wound, other sites)

Form 402 or 1252
Approved Submitters: MSDH facilities
Sample Type : Swab from body site collected using Culturette ™ or equivalent.
Collection Guidelines: Take care to crush or break ampule to release transport media immediately following collection.
Storage Instructions: Follow instructions for collection device. Culturette must be received within 48 hours of collection.
Shipping Requirements: Silica Gel Strep Mailers are unacceptable. Current shipping instructions for MSDH Contract Courier.
Test Methods: Conventional culture and biochemicals.
Test Availability: Monday-Friday
Limitations: Organism must be viable.
Test Specific Causes for Rejection: Culturette with ampule crushed must be received within 48 hours of collection.
Reference Value: Normally Negative
Turnaround time: **3-14 business days**

D

Dengue Virus: see Arbovirus IgM Antibody Testing and Arbovirus RNA Virus detection by RT-PCR

Diphtheria Culture

Form 402 or 1252
Approved Submitters: All
Sample Type: Swab obtained from nose, throat or skin lesion in transport media.
Collection Guidelines: The swab should be submitted in Stuart's or Amie's Transport Media available in the form of a culturette from Central Supply. NOTE: This is the same culturette used other miscellaneous cultures. Swabs in silica gel packs will be accepted.
Storage Instructions: Specimens should be received within 24 hours of collection. Store at ambient temperature until shipment.
Shipping Requirements: Current shipping guidelines for biological substances, Appendix E.
Test Methods: Conventional culture and biochemicals.
Additional Test Information: Notify lab when a specimen is being collected.
Test Availability: Monday-Friday
Limitations: Organism must be viable.
Reference Value: Normally Negative
Turnaround time: Bacterial isolation and identification can take up to 14 days.
Critical Test Value: All results are phoned to Health Care Providers immediately.

E

Eastern Equine Encephalitis Virus Antibodies: see Arbovirus Screening

Enteric culture-*Salmonella*/*Shigella*/*Campylobacter*/*E. Coli* O157

Form 402 or 1252
Approved Submitters: All
Sample Type: Stool in Cary-Blair transport media, bacterial isolates.
Volume/Amount Required: Fill transport bottle to fill line for stool. Do not overfill the bottle.
Collection Guidelines: Completely emulsify the stool using spork attached to lid.
Storage Instructions: Refrigerate; stool must be received within 96 hours of collection (Ship on cold packs).
Shipping Requirements: Current shipping guidelines for Biological Substances, Appendix E.
Test Methods: Conventional culture and biochemicals; Whole-Genomic Sequencing
Test Availability: Monday –Friday
Limitations: Organism must be viable.
Test Specific Causes for Rejection: Specimen preserved in Cary Blair vial must be received within 96 hours of collection; culturette with ampule crushed must be received within 3 days of collection; specimen in specimen container without preservative should be received on a cold pack within 24 hours (raw stool specimen received on cold pack after 24 hours of collection will be acceptable for Shiga toxin producing E. coli testing only); specimen container under-filled or overfilled.
Reference Value: Normally Negative
Turnaround time: Bacterial isolation and identification can take up to 14 days; Salmonella typing can take up to 31 days.

F

Flu: see Influenza

Francisella tularensis

Form 1251

Approved Submitters: MS Sentinel Laboratories, Law Enforcement, MSDH Office of Emergency Preparedness and Response.

Sample Type: Clinical Specimens: tissue, scraping of ulcer, swab(s) of ulcer, lymph node aspirate, tissue aspirates, pleural fluid, EDTA whole blood, and respiratory samples.

Culture: pure growing culture isolate on an appropriate agar slant in a screw capped tube or blood culture.

Environmental samples submitted by law enforcement personnel.

Volume/Amount Required: 1 mL sputum, 0.5 mL blood, 0.5 mL fluids and 1 gram tissue.

Collection Guidelines: For whole blood, allow any size EDTA (lavender top) tube to completely fill, half full minimum. Tissue pieces (at least the size of a pea) should be collected and kept moist for transport in sterile container at room temperature.

Storage Instructions: Clinical specimens should be stored at 2-8°C. Isolates and environmental samples should be stored at room temperature.

Shipping Requirements: Ship all clinical specimens on cold packs within 24 hours of collection using current shipping guidelines for biological substances, Appendix E. Ship all isolates at room temperature using current shipping guidelines for biological substances, Appendix E.

Additional Test Information: Notify MPHL Bioterrorism Coordinator or Special Microbiology Section at 601-576-7400 prior to submission.

Test Method: Conventional culture and Polymerase Chain Reaction (PCR).

Test Availability: Tested Monday-Friday. With notification, Saturday and Sunday.

Limitations: PCR: If inhibitors are present in a DNA extraction, PCR assays may produce a false negative result. A false negative result may occur if a sample is improperly collected, transported or handled. False negative results may occur if inadequate numbers of organisms are present in the sample. Conventional Culture and Biochemicals: Organism must be viable for testing.

Reference Value: Normally Not Detected

Turnaround time: A preliminary report is available within 24 hours. A final report is available within 10 days.

Critical Test Value: All test results are phoned to submitter.

See Appendix E for more shipping information

G

Gonorrhea NAAT: see Chlamydia/Gonorrhea NAAT

Glucose

Approved Submitters: MSDH facilities

Sample Type: EDTA fluoride whole blood (gray top tube).

Volume/Amount Required: Tube designed to draw half full.

Collection Guidelines: Invert gently 10 times immediately after collection.

Storage Instructions: Specimen must be received in laboratory within 72 hrs of collection, store at room temperature until shipment.

Shipping Requirements: Current shipping instructions for MSDH Contract Courier.

Additional Test Information:

- If glucose is ordered as one of several chemistry tests, Form 406 must be completed and submitted with a gray top tube as a separate test.

Test Methods: Photometric, adaption of hexokinase G6PD.

Test Availability: Monday-Friday
Test Specific Causes for Rejection: Specimen too old (must be received within 72 hrs); specimen has excessive hemolysis, lipemia, or icterus.
Reference Ranges:

Fasting glucose	74-106 mg/dL
Random or casual glucose (CPG)	Less than140mg/dL

Turnaround time: 3 business days
Critical Test Value : Results of less than 40 or greater than 250 mg/dL are phoned to Health Care Providers immediately.

H

hCG, quantitative, serum (Pregnancy Testing)

Form 402 or 1252
Approved Submitters: MSDH Facilities
Sample Type: Serum, whole blood in plain (red top) or SST tube.
Volume/Amount Required: 1 mL serum
Collection Guidelines: Avoid hemolysis.
Storage Instructions: Specimen must be received in laboratory within 5 days of collection. Refrigerate the specimen if possible until shipment.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier.
Test Method: Chemiluminescence Immunoassay.
Test Availability: Monday-Friday
Limitations: Heterophilic antibodies in serum or plasma samples may cause interference in immunoassays. These antibodies may be present in blood samples from individuals regularly exposed to animals or who have been treated with animal serum products. Exogenous hCG administered within 7–10 days of sampling may give a detectable test result. When using the determination of hCG to confirm pregnancy, care should be taken to exclude the possibility of hCG secreting tumors.
Test Specific Causes for Rejection: Specimen not received in laboratory within 5 days of collection.
Reference Value: 0-3mIU/L in healthy males and non-pregnant females.
Values greater than or equal to 25mIU/L indicate possible preganancy in females.
Turnaround time: 5 business days
Critical Test Value: Any decrease in hCG levels from previously reported results phoned to Health Care Providers immediately.

Hemoglobin and Hematocrit (H&H, Anemia Screen)

Approved Submitters: MSDH facilities
Sample Type: EDTA whole blood.
Volume/Amount Required: Allow any size lavender top tube to completely fill, minimum half full. 2 ml whole blood required for analysis.
Collection Guidelines: Immediately invert gently 8-10 times after collection. Do not collect on Friday for Saturday delivery.
Storage Instructions: Specimens must be received by the laboratory on cold packs within 24 hours of collection and refrigerated. Refrigerate until shipment.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier

Test Method: Electronic Impedance
Test Availability: Monday-Friday (Do not collect on Friday for Saturday delivery.)
Reference Ranges:

	1-30 days of age	2-12 months of age	13-23 months of age	2-9 years of age	10-18 years of age		>18 years of age/Adult	
Hemoglobin	13.4 - 19.9	11.0 - 14.0			12.5-16.1	12.0-15.0	14.0-17.5	12.3-15.3
Hematocrit	42.0 - 65.0	33.0 - 43.0			36.0-47.0	35.0-45.0	41.5-50.4	35.9-44.6

Turnaround time: 3 business days.
Critical Test Value: hemoglobin levels less than 6.0 or greater than 20.0 g/dL phoned to Health Care

Hepatitis A Antibody, Total and IgM class

Form 402 or 1252
Approved Submitters: MSDH facilities
Sample Type: Serum, whole blood collected in plain (red top) or SST tube.
Volume/Amount Required: 4 mL whole blood or 2 mL serum.
Collection Guidelines: Collect whole blood in serum separator tube (SST) or plain red top tube. A SST tube can be accepted spun or unspun.
Storage Instructions: Store refrigerated if possible until shipment. However, room temperature storage is acceptable.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier. Specimens must be received within 7 days of collection.
Additional Test Information: Samples are initially tested for Hepatitis A total antibodies with reflex testing for IgM class antibodies if indicated.
Test Methods: Chemiluminescence Immunoassay
Test Availability: Monday-Friday
Limitations: Levels of Hep A antibody may be below detectable limits in early infection. Individuals who received the vaccine may demonstrate a detectable level of antibody. Heterophilic antibodies in serum samples may cause interference in immunoassays.
Test Specific Causes for Rejection: Specimens with less than 2 mL whole blood; specimens with gross lipemia; specimens collected for more than 7 days and not refrigerated or frozen.
Reference Ranges: Normally Non-Reactive
Turnaround time: 5 business days
Critical Test Value: Reactive Hepatitis A IgM Antibody results phoned to Health Care Providers immediately.

Hepatitis B Core Total Antibody with reflex to Hepatitis B Core IgM Antibody

Approved Submitters: MSDH facilities
Sample Type: Serum, whole blood collected in plain (red top) or SST tube
Volume/Amount Required: 4 mL whole blood or 2 mL serum.
Collection Guidelines: Collect whole blood in serum separator tube (SST) or plain red top tube. A SST tube can be accepted spun or unspun.
Storage Instructions: Store refrigerated if possible until shipment. However, room temperature is acceptable.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier. Specimens must be received within 7 days of collection.

Additional Test Information:

- If Hepatitis B Core total antibodies are positive, then a test for hepatitis B core IgM class antibodies is performed.

Test Method: Chemiluminescence Immunoassay
Test Availability: Monday-Friday
Interpretation Guidance: Refer to the CDC's Hepatitis B serologic testing interpretative guide at http://www.cdc.gov/hepatitis/HBV/PDFs/SerologicChartv8.pdf for assistance.
Limitations: Levels of HBC Ab may be undetectable in early infections**.** Heterophilic antibodies in serum samples may cause interference in immunoassays. Results from immunosuppressed individuals should be interpreted with caution.
Test Specific Causes for Rejection: Specimens with less than 2 mL whole blood; specimens with gross lipemia; specimens collected for more than 7 days and not refrigerated or frozen.
Reference Value: Normally Non-Reactive; Interpretation depends on clinical setting.
Turnaround time: 5 business days.

Hepatitis B Surface Antigen

Approved Submitters: MSDH facilities
Sample Type: Serum, whole blood collected in plain (red top) or SST tube.
Volume/Amount Required: 4 mL whole blood or 2 mL serum.
Collection Guidelines: Collect whole blood in serum separator tube (SST) or plain red top tube. A SST tube can be accepted spun or unspun.
Storage Instructions: Store refrigerated if possible until shipment, room temperature is acceptable.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier. Specimens must be received within 7 days of collection.
Additional Test Information: A hepatitis profile consisting of Hepatitis B Core Antibody and Hepatitis B Core IgM Antibody is run on all first time positive patients. Reflex testing for confirmation using antibody neutralization methods performed if indicated.
Test Method: Chemiluminescence Immunoassay
Test Availability: Monday-Friday
Interpretation Guidance: Refer to the CDC's Hepatitis B serologic testing interpretative guide at http://www.cdc.gov/hepatitis/HBV/PDFs/SerologicChartv8.pdf for assistance..
Limitations: A negative result does not exclude the possibility of exposure to or infection with Hepatitis B virus. Recently vaccinated individuals may exhibit a transient positive result.
Test Specific Causes for Rejection: Specimens with less than 2 mL whole blood; specimens from patients less than 3 years of age; specimens with gross lipemia; specimens collected for more than 7 days and not refrigerated or frozen.
Reference Value: Normally Non-Reactive
Turnaround time: 5 business days
Critical Test Value: All results in blood exposure incidents phoned to Health Care Providers immediately.

Hepatitis B Surface Antibody

Approved Submitters: MSDH facilities
Sample Type: Serum, whole blood collected in plain (red top) or SST tube.
Volume/Amount Required: 4 mL whole blood or 2 mL serum.
Collection Guidelines: Collect whole blood in serum separator tube (SST) or plain red top tube. A SST tube can be accepted spun or unspun.
Storage Instructions: Store refrigerated if possible until shipment, room temperature is acceptable.

Shipping Requirements: Current shipping instructions for MSDH Contract Courier. Specimens must be received within 7 days of collection.
Test Method: Chemiluminescence Immunoassay.
Test Availability: Monday-Friday
Interpretative Guidance: Refer to the CDC's Hepatitis B serologic testing interpretative guide at http://www.cdc.gov/hepatitis/HBV/PDFs/SerologicChartv8.pdf for assistance.
Limitations: This assay does not differentiate between a vaccine induced immune response and an immune response induced by infection with HBV. Results from immunosuppressed individuals should be interpreted with caution. Individuals that have received blood component therapy during the previous 3-6 months may have a false reactive result due to passive transfer of antibody.
Test Specific Causes for Rejection: Specimens with less than 2 mL whole blood; specimens from patients less than 3 years of age; specimens with gross lipemia; specimens collected for more than 7 days and not refrigerated or frozen.
Reference Value: Unvaccinated: Normally Non-Reactive; Vaccinated: Normally Reactive
Turnaround time: 5 business days.

Hepatitis C Antibody (HCV)

Form 402
Approved Submitters: MSDH facilities
Sample Type: Serum, whole blood collected in plain (red top) or SST tube.
Volume/Amount Required: 4 mL whole blood or 2 mL serum.
Collection Guidelines: Collect whole blood in serum separator tube (SST) or plain red top tube. A SST tube can be accepted spun or unspun.
Storage Instructions: Store refrigerated if possible until shipment, room temperature is acceptable.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier. Specimens must be received within 7 days of collection.
Test Method: Chemiluminescence Immunoassay
Test Availability: Monday-Friday
Limitations: A negative test result does not exclude the possibility of exposure to or infection with Hepatitis C virus. Results from immunosuppressed individuals should be interpreted with caution. Heterophilic antibodies in serum samples may cause interference in immunoassays.
Test Specific Causes for Rejection: Specimens with less than 2 mL whole blood; specimens from patients less than 3 years of age; specimens with gross lipemia; specimens collected for more than 7 days and not refrigerated or frozen.
Reference Value: Normally Non-Reactive
Turnaround time: 5 business days.
Critical Test Value: All results in blood exposure incidents phoned to Health Care Providers immediately.

Human Immunodeficiency Virus 1 and 2 Antibodies and p24 Antigen Screen (HIV-1, 2 and p24)

Form 364 or 1252

Approved Submitters: MSDH facilities

Sample Type: Serum, whole blood collected in plain (red top) or SST tube.

Volume/Amount Required: 4 mL whole blood or 2 mL serum.

Collection Guidelines: Do NOT centrifuge.

Storage Instructions: Store refrigerated if possible until shipment, room temperature is acceptable

Shipping Requirements: Current shipping instructions for MSDH Contract Courier. Specimens must be received within 7 days of collection.

Additional Testing Information:

- Antibody testing is not recommended for children under 24 months of age.
- The testing sequence may take several weeks.
- A positive test does not necessarily indicate active infection; false positive tests can occur.
- Reflex confirmatory HIV Differentiation Assay by Enzyme Immunoassay (Geenius HIV 1/2 confirmatory assay) is performed on all samples demonstrating HIV 1,2 antibody reactivity.
- An HIV-1 Nucleic Acid Amplification Test (NAAT by PCR) is performed on all specimens that are non-reactive for HIV 1-2, reactive for HIV antibodies-undifferentiated, and indeterminate for HIV-1 by the HIV Differentiation Assay.

Important:

For HIV Rapid Test confirmatory testing, mark Rapid Test Positive on request form. HIV 1,2 antibodies may be below detectable levels in Rapid Test positive patients with early infection.

Test Method: Chemiluminescence Immunoassay (4th generation screen), Enzyme Immunoassay Geenius), and Transcription Mediated Amplification (NAAT).

Test Availability: Monday-Friday

Limitations: Screen Samples with total protein greater than 9g/dL may give false reactive results. Heterophilic antibodies in serum samples may cause interference in immunoassays. Levels of HIV antibodies may be undetectable in the early stages of infection. A negative test result does not exclude the possibility of exposure to or infection with HIV. Nonreactive results for an individual subject indicate absence of detectable HIV antibodies. However, a nonreactive test result does not preclude the possibility of exposure to or infection with HIV-1 and/or HIV-2. Nonreactive results can occur if the quantity of marker present in the sample is below the detection limits of the assay, or if the marker that is detected is not present during the stage of disease in which a sample is collected. False negative results may occur in individuals infected with HIV-1 and/or HIV-2 who are receiving highly active antiretroviral therapy (HAART).

NAAT: Test has not been validated for use with patients receiving anti-retroviral therapy.

Test Specific Causes for Rejection: Specimens with less than 2 mL whole blood; specimens from patients less than 3 years of age; specimens with gross lipemia; specimens collected for more than 7 days and not refrigerated or frozen.

Reference Value: Normally Non-Reactive (Screen, Multispot); Normally Not Detected (NAAT).

Turnaround time: 10 – 15 business days.

Critical Test Value: All results in blood exposure incidents phoned to Health Care Providers immediately.

I

Influenza, SARS-CoV-2 (COVID-19) Multiplex RT-PCR

Form 930

Approved Submitters: MSDH Respiratory Virus Surveillance Sites.
Sample Type: Nasopharyngeal swabs and nasal specimens collected swab.
Collection Guidelines: All respiratory specimens should be placed in viral transport media for shipment. Swab specimens should be collected using only swabs with a synthetic tip such as nylon or Dacron® and an aluminum or plastic shaft. Calcium alginate swabs are not acceptable and cotton swabs with wooden shafts are not recommended and will be rejected.
Storage Instructions: Store at 2-8°C until shipment. Specimens should be submitted within 24 hours of collection to the laboratory for optimal testing. Specimens that are not received cold on frozen ice packs ≤ 3 days from the date of collection will be rejected.
Shipping Requirements: Ship specimens with a **cold pack** in a RIGID outer container (Styrofoam box or cooler). DO NOT SHIP SPECIMENS IN AN ENVELOPE.
* Specimens are shipped to the MPHL through the MSDH courier system. Please contact your district health department surveillance nurse or the State Influenza Coordinator at 601-576-7725 to insure appropriate shipping arrangements through the MSDH courier system.
Additional Test Information: Specimens should be collected from human patients with signs and symptoms of respiratory infection. Subtyping will be performed on all influenza A positive specimens and genotyping on all influenza B specimens.
Test Method: Reverse Transcription Polymerase Chain Reaction (RT-PCR).
Test Availability: Monday-Friday
Limitations: False negative results may occur if a specimen is improperly collected, transported or handled. Negative Multiplex Assay results do not preclude SARS-CoV-2, influenza A, and/or influenza B infection and should not be used as the sole basis for diagnosis, treatment or other patient management decisions. Negative results must be combined with clinical observations, patient history, and/or epidemiological information. Negative results obtained from individuals who are not exhibiting clinical signs and symptoms associated with respiratory viral infection at the time of specimen collections should be interpreted with particular caution. Negative results in asymptomatic individuals cannot be used as definitive evidence that an individual has not been exposed to SARS-CoV-2 or influenza viruses and has not been infected with any of these viruses. An inconclusive test result may be due to amplification inhibitors or inadequate numbers of organisms present in the specimen. An invalid test result may be due to specimen contamination or inappropriate collection.
Test Specific Causes for Rejection: Specimen received at room temperature; specimen not received in viral transport media.
Reference Value: Normally Not Detected
Turnaround time: 3-5 business days.
Critical Test Value: All results of novel influenza strains are reported to Health Care Providers.

See Appendix K for complete collection instructions

Isolates -Confirmation and Grouping *Including Salmonella, Shigella, E. Coli:O157, Non-O157 Shiga-toxin producing E. Coli, N. meningitidis, and H. influenzae*

Form 402 or 1252
Approved Submitters: All
Sample Type: Pure isolates on solid medium (without sugars) in screw cap tube. MacConkey broth or GN broth acceptable for *E. Coli: O157* and other STEC isolates. (Ship broths on cold packs).
Shipping Requirements: Current shipping guidelines for biological substances, Appendix E.
Test Methods: Conventional culture, biochemicals, MALDI-TOF mass spectrometry, serological typing or whole genomic sequencing.
Test Availability: Monday-Friday
Limitations: Culture must be viable.
Reference Value: Not Applicable

Turnaround time: Bacterial isolation and identification can take up to 14 days; Salmonella typing can take up to 31 days.

L

La Crosse Encephalitis Virus Antibodies : see Arbovirus Screening

Lead Screening

Approved Submitters: MSDH facilities
Sample Type: EDTA whole blood
Volume/Amount Required: 200 µL minimum
Collection Guidelines:

- Collect capillary blood in certified lead free EDTA microtainer devices. Use blue lancets provided by the laboratory.
- Collect venous blood in 3 mL certified lead free K2, EDTA tan-topped tubes.

Obtain tan-top venous blood collection tubes from MPHL.
Storage Requirements: Samples may be stored at room temperature until shipping.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier. Specimens must be received within 1 week of collection.
Test method: ICP-MS
Test Availability: Monday-Friday
Limitations: Specimens must be collected with MPHL-approved collection supplies and devices to avoid contamination with environmental lead.
Reference Ranges:

Children 5 years of age or younger	Less than 5µg/dL
Children 6 years of age or older and adults	Less than 10µg/dL

Turnaround time: 5 - 10 business days
Critical Test Value: Results greater than 10 µg/dL are phoned to Health Care Providers immediately.
See Appendix K for complete collection instructions

M

Malaria, Blood Parasites

Form 402 or 1252
Approved Submitters: All. Please notify lab before sending.
Sample Type: Thick and thin blood smears are accepted, EDTA whole blood (lavender top) is the specimen of choice.
Volume /Amount Required: Allow any size lavender top tube to completely fill, minimum half full. 1mL whole blood required for analysis.
Collection Guidelines: Invert whole blood tube gently 5-8 times after collection. Smears should be prepared immediately after collection and allowed to air dry thoroughly before packaging for shipment.
Storage Requirements: Ambient temperature, smears should be kept away from moisture.
Shipping Requirements: Current shipping guidelines for biological substances, Appendix E.
Test Methods: Giemsa Stain and microscopy.
Test Availability: Monday-Friday

Limitations: Specimen quality is dependent on the timing of specimen collection because parasitemia can fluctuate.
Reference Value: Normally Negative
Turnaround time: 5 business days, longer if sent to CDC.
Critical Test Value: All results phoned to Health Care Providers immediately.

Measles Antibody, IgG and IgM

Form 402 or 1252
Approved Submitters: All MSDH facilities for IgG; Office of Epidemiology only for IgM
Sample Type: Serum, whole blood collected in plain (red top) or SST tube
Volume/Amount Required: 4mLs whole blood or 2 mLs serum
Collection Guidelines: Collect whole blood in serum separator tube (SST) or plain red top tube
Storage Instructions: Store refrigerated if possible until shipment. Specimens must be received within 24 hours of collection.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier
Test Methods: IgM Antibodies performed by Enzyme Linked Immunosorbent Assay (ELISA)
IgG Antibodies performed by Enzyme Linked Fluorescent Assay (ELFA)
Test Availability: Monday-Friday
Limitations: Measles IgG: Assay should be used as a mean of determining the immune status of an individual. Measles IgM: The absence of detectable IgM antibody does not rule out the possibility of recent or current infection.
Test Specific Causes for Rejection: **IgG**: Collection tube submitted with less than 2 mLs whole blood for adults; gross lipemia; specimen collected in tubes containing additives such as EDTA or Heparin; specimen collected for more than 24 hours and stored or shipped at an ambient temperature; specimen collected for more than 5 days and not frozen at -20°C; **IgM**: Specimen grossly hemolyzed, grossly icteric or grossly lipemic
Reference Value for IgG: Unvaccinated: Normally Non-Reactive; Vaccinated: Normally Reactive
Reference Value for IgM: Normally Non-Reactive
Turnaround time: 3 working days

Measles Virus RT-PCR

Form 402 or 1252
Approved Submitters: All Office of Epidemiology approval required prior to submittal.
Sample Type: Throat or nasopharyngeal swabs placed in viral transport media; urine.
Collection Guidelines: Collect both specimen types (Throat or NP swab AND a Urine specimen) for PCR as soon as possible after rash onset (maximum 14 days after rash onset). Detection of measles RNA is most successful when samples are collected on the first day of rash through the 3 days following onset of rash.
Collection Instructions: A throat swab is preferred. NP swabs are acceptable but not preferred.
Throat swab**:** Swab tonsillar areas and posterior nasopharynx. Use tongue blade to depress tongue to prevent contamination of swab with saliva. Place swab into 2-3 mL of transport media.
Nasopharyngeal swab: Swab the nasal passage or the nasopharynx. Place swab into 2-3 mL of transport media.
Urine specimen: Collect 10-40 mL of urine in a sterile urine specimen container. Have patient void directly into container, collecting from the first part of the urine stream if possible. First-morning voided specimens are ideal, but any urine collection is adequate.
Storage Instructions: Store at 2-8°C until shipment**.**
Shipping Requirements: Ship specimens with an ice pack in a RIGID outer container (Styrofoam box or

cooler). Specimens must be received within 3 days of collection.
Test Methods: Reverse Transcription Polymerase Chain Reaction (RT-PCR).
Test Availability: Monday-Friday
Limitations: Failure to detect measles virus RNA by RT-PCR in samples from a person with clinically compatible measles symptoms does not rule out measles as a diagnosis. Successful detection of measles virus depends primarily on the timing of collection and quality of the clinical sample. Vaccinated individuals may shed virus for a shorter period and might shed smaller amounts of virus, thus degradation of the sample has greater consequences for successful detection of virus.
Test Specific Causes for Rejection: Specimen not refrigerated during transport; Use of improper swab (swab with calcium alginate or cotton tips and wooden shafts); swab not received in viral transport medium (dry swabs).
Reference Value: Normally Not Detected
Turnaround time: 3 business days.
Critical Test Value: All results are phoned to Health Care Providers immediately.

See Appendix N for complete collection instructions.

Meningitis/Encephalitis Panel

Form 402 or 1252
Approved Submitters: All**.** Office of Epidemiology approval required prior to submittal.
Sample Type: 250 µL of CSF
Collection Guidelines:
1. Do not centrifuge CSF after collection.
2. Label a sterile, screw-capped tube with patient's name (first and last), date of collection.
3. Maintain sterility of specimen by storing at 2 – 8ºC.
4. Send to the laboratory within 24 hours of collection.

Storage Instructions: Store at 2-8°C**.**
Shipping Requirements: Ship specimens with an ice pack in a RIGID outer container (Styrofoam box or cooler).
Test Methods: Nested, multiplex PCR.
Test Availability: Monday-Friday
Test Description: The FilmArray Meningitis/Encephalitis (ME) Panel is a qualitative multiplexed nucleic acid-based *in vitro* diagnostic test capable of simultaneous detection and identification of multiple bacterial, viral, and yeast nucleic acids directly from cerebrospinal fluid (CSF) specimens obtained via lumbar puncture from individuals with signs and/or symptoms of meningitis and/or encephalitis. The following organisms are identified using the FilmArray ME Panel:
Bacteria: *Escherichia coli* K1, *Haemophilus influenza, Listeria monocytogenes, Neisseria meningitidis* (encapsulated) , *Streptococcus agalactiae, Streptococcus pneumonia.*
Viruses: Cytomegalovirus, Enterovirus, Herpes simplex virus 1, Herpes simplex virus 2, Human herpesvirus 6, Human parechovirus, Varicella zoster virus.
Yeast: *Cryptococcus neoformans/gattii.*
Limitations: The FilmArray ME Panel is indicated as an aid in the diagnosis of specific agents of meningitis and/or encephalitis and results are meant to be used in conjunction with other clinical, epidemiological, and laboratory data. Results from the FilmArray ME Panel are not intended to be used as the sole basis for diagnosis, treatment, or other patient management decisions. Positive results do not rule out co-infection with organisms not included in the FilmArray ME Panel. The agent detected may not be the definite cause of the disease. Negative results do not preclude central nervous system (CNS) infection. Not all agents of CNS infection are detected by this test and sensitivity in clinical use may differ from that described in the package insert. The FilmArray ME Panel is not intended for testing of specimens collected

from indwelling CNS medical devices. The FilmArray ME Panel is intended to be used in conjunction with standard of care culture for organism recovery, serotyping, and antimicrobial susceptibility testing.
Test Specific Causes for Rejection: Specimen not refrigerated during transport; Less than 250 µL of CSF received. Specimen received more than 6 days after collection.
Reference Value: Normally Not Detected
Turnaround time: 3 business days.
Critical Test Value: All results are phoned to Health Care Providers immediately.

Microsporidium: see Cryptosporidium

Mumps Virus RT-PCR

Form 402 or 1252
Approved Submitters: All Office of Epidemiology approval required prior to submittal.
Sample Type: Buccal swab placed in viral transport media.
Collection Guidelines: See Appendix I for complete collection instructions.
Storage Instructions: Store at 2-8°C until shipment**.**
Shipping Requirements: Ship specimens with a cold pack in a RIGID outer container (Styrofoam box or cooler).
Test Methods: Reverse Transcription Polymerase Chain Reaction (RT-PCR).
Test Availability: Monday-Friday
Limitations: Failure to detect mumps virus RNA by RT-PCR in samples from a person with clinically compatible mumps symptoms does not rule out mumps as a diagnosis. Successful detection of mumps virus depends primarily on the timing of collection and quality of the clinical sample. Vaccinated individuals may shed virus for a shorter period and might shed smaller amounts of virus, thus degradation of the sample has greater consequences for successful detection of virus.
Test Specific Causes for Rejection: Specimen not refrigerated during transport; Use of improper swab (swab with calcium alginate or cotton tips and wooden shafts); swab not received in viral transport medium.
Reference Value: Normally Not Detected
Turnaround time: 3 business days.
Critical Test Value: All results are phoned to Health Care Providers immediately.

See Appendix G for complete collection instructions

Mumps IgG Antibody(Outbreak Investigation Use Only)

Form 402 or 1252
Approved Submitters: MSDH facilities. Office of Epidemiology approval required prior to submittal.
Sample Type: Serum, whole blood in serum separator tube (SST) or plain red top tube.
Volume/Amount Required: 4 mL whole blood or 2 mL serum.
Collection Guidelines: Collect whole blood in serum separator tube (SST) or plain red top tube.
Storage Instructions: Store refrigerated if possible until shipment.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier. Specimens must be received within 24 hours of collection.
Test Method: IgG Antibodies performed by Enzyme Linked Fluorescent Assay (ELFA).
Test Availability: Monday-Friday
Limitations: Assay should be used as a means of determining the immune status of an individual. Because Mumps virus shares antigenic relationships with other viruses of the paramyxovirus groups, serologic cross reactions are possible.

Test Specific Causes for Rejection: Collection tube submitted with less than 2 mL of whole blood from an adult; gross lipemia; specimen collected in tubes containing additives such as EDTA or Heparin; specimens collected for more than 24 hours and stored or shipped at ambient temperature; specimen collected for more than 5 days and not frozen at -20 degrees; specimens grossly hemolyzed.
Reference Value: Unvaccinated: Normally Non-Reactive; Vaccinated: Normally Reactive.
Turnaround time: 3 business days**.**

Mycobacteria, NTM: see TB

N

N. meningitidis: see Isolates-Confirmation and Grouping

Norovirus RT-PCR

Form 402 or 1252
Approved Submitters: All Office of Epidemiology approval required prior to submittal.
Sample Type: Stool in a sterile container with no preservatives or media and a screw cap lid (i.e. sterile urine cup.). Stool samples submitted in Cary Blair transport media are also acceptable but are not the preferred samples type.
Volume/Amount Required: Minimum sample is a quarter size amount of solid stool, 1 mL of liquid stool, and 2 mL of vomitus. If stool is submitted in Cary Blair, fill container to fill line.
Collection Guidelines: Stool samples collected 24 - 48 hours after onset of symptoms are ideal.
Storage Requirements: After collection, specimens should be immediately refrigerated at 2-8°C,
Shipping Requirements: Ship on ice packs within 24 hours following current shipping guidelines for biological substances, Appendix E.
Test Method: Reverse Transcription Polymerase Chain Reaction (RT-PCR).
Test Availability: Monday-Friday
Limitations: Specimens should be collected within 48 to 72 hours after symptom onset when viral excretion is greatest. Norovirus can sometimes be detected in stool specimens collected later in the illness or after symptoms have resolved (up to 7 to 10 days after onset).
Test Specific Causes for Rejection: Specimen not refrigerated.
Reference Value: Normally Not Detected
Turnaround time: 3 business days.

O

OCP (Ova, Cysts and Parasites)

Form 402 or 1252
Approved Submitters: All
Sample Type: Stool collected in 10% formalin preservative. Please contact the lab for collection bottle and instructions.
Volume/Amount Required: Add stool until formalin rises to fill line.
Collection Guidelines: Completely emulsify stool using spork attached to lid. Do not overfill the bottle. Fill only to the fill line.
Storage Instructions: Ambient temperature
Shipping Requirements: Current shipping guidelines for biological substances, Appendix E.

Test Method: Formalin Ethyl Acetate concentration and microscopy.
Test Availability: Monday-Friday
Limitations: The ability to detect parasites is limited by the quality of the specimen collection. A single negative specimen does not rule out parasitic infection.
Test Specific Causes for Rejection: Specimen bottle over or under filled; Stool not emulsified.
Reference Value: Normally Negative
Turnaround time: 1-5 days.

P

Parasites, Blood: see Malaria

Pertussis (Whooping Cough) Culture

Form 402 or 1252

- Call lab for instructions.
- Transport media and calginate swabs must be obtained from lab.
- PCR is not performed on specimens submitted for culture.

Test methods: Conventional culture
Test Availability: Monday-Friday
Limitations: Culture must be viable and capable of growing in transport media.
Reference Value: Normally Negative.
Turnaround time: 10 business days

Pertussis by PCR: See Bordetella species (*B.pertussis, B. parapertussis, and B.holmesii*) PCR

Pinworm

Form 402 or 1252
Approved Submitters: All
Sample Type: "ScotchTape" Prep
Collection Guidelines:

- Specimens should be collected at night when child is sleeping or in the morning prior to bathing.
- Use clear (not Magic brand) cellulose tape.
- Use only enough tape to cover top of slide. Do not wrap tape around slide.
- Using tongue depressor or equivalent, touch sticky side of tape strip to peri-anal region. Stick tape to clean microscope slide.
- Place in protective mailer or cardboard to prevent breakage.
- Place protective mailer containing slide in a ziplock biohazard shipping bag with requisition in the outer pocket.

Storage Requirements: Store at ambient temperature until shipped.
Shipping Requirements:

- Ship according to current shipping guidelines for biological substances, Appendix E.
- Do not mail in same package as pap smears.

Test Method: Microscopic observation.

Test Availability: Monday-Friday
Limitations: Clear tape must be used. Specimen quality depends on timing of collection**.** A single negative specimen does not rule out parasitic infection.
Test Specific Causes for Rejection: Frosted tape used; tape wrapped around slide.
Reference Value: Normally Negative
Turnaround time: 5 business days.

Potassium: see Chemistry Panel

Pregnancy Testing : see hCG, quantitative

Q

Quantiferon: See TB EIA

R

Rabies

Form 433
Approved Submitters: Mississippi State Department of Health approval required prior to submittal.
Sample Type: Head only for medium and large animals (example dogs, cats, others); whole bats should be submitted to allow identification of species.
Volume/Amount Required: Animal head, whole bat.
Collection Guidelines: Humanely euthanize all animals prior to submittal. Submit the whole bat. Submit the head of all other animals after removal by trained veterinary staff. Veterinarians may submit the entire brain of the animal or labeled cross sections of the brain that clearly identify the cerebellum and brain stem. Cross-sections from the hippocampi may be submitted for the cerebellum when the latter is unavailable**.**
Storage Requirements: 2-8°C (do not freeze)
Shipping Requirements: See Appendix C for complete shipping information.
Additional Testing Information: Specimens should not be frozen because freezing delays and frequently compromises the examination.
Test Availability: Routine testing is available Monday –Friday during regular business hours. Weekend/holiday testing will be restricted to EMERGENCY SITUATIONS ONLY with Office of Epidemiology approval.
Test Method: Direct Fluorescent Antibody (DFA).
Limitations: Rabies infection may be focal, especially in large animals. Therefore, valid rabies results are dependent upon testing the medulla and the cerebellum or hippocampus from both hemispheres of the brain. Repeated sample freeze-thaw cycles may reduce test sensitivity and should be avoided.
Test Specific Causes for Rejection: Animal received decomposed. Fixation of animal tissue in formalin or other chemicals. Brain tissue that has been exposed to excessive heat. Animal head damaged and brain is unidentifiable or missing.
Reference Value: No particles characteristics of Rabies infection seen.
Turnaround time: 4 business days
Critical Test Value: All positives and unsatisfactory results are phoned to Submitter immediately.

Referral Tests

Form 402 or 1252

Approved Submitters: MSDH program approval required prior to submittal.
Sample Type: Test specific requirements provided upon approval
Volume/Amount Required: Test specific requirements provided upon approval
Collection Guidelines: Test specific requirements provided upon approval
Storage Requirements: Test specific requirements provided upon approval
Shipping Requirements: See Appendix C for complete shipping information.
Additional Testing Information: A variety of referral services are available through the Public Health Laboratory for unique serology, molecular, culture, and microscope-based tests performed by the Centers for Disease Control (CDC). A complete patient history must be submitted with each specimen to avoid any delays in testing.
Test Availability: Routine referral testing is available Monday–Friday during regular business hours. Weekend/holiday testing will be restricted to EMERGENCY SITUATIONS ONLY with MSDH program approval.
Turnaround time: Varies depending upon event but routinely 5 business days for molecular and microscopic-based testing and 6 weeks for serology and culture testing.
Critical Test Value: All positive results are phoned to submitter or approving MSDH program immediately. Final reports are mailed to submitter upon receipt.

Respiratory Virus Panel

Form 402 or 1252

Approved Submitters: All Office of Epidemiology approval required prior to submittal.
Sample Type: Nasopharyngeal swab in viral transport medium(VTM).
Volume/Amount: 300 µL sample swab in VTM.
Collection Guidelines: Swab must have a Dacron or Rayon tip with a flexible metal shaft or be a flocked swab with a plastic shaft. Swab must be placed in VTM with the cap securely tightened.
Storage Requirements: Store at 2-8°C until shipment. Specimens should be submitted within 24 hours of collection to the laboratory for optimal testing.
Shipping Requirements: Ship specimens with an **ice pack** in a RIGID outer container (Styrofoam box or cooler). DO NOT SHIP SPECIMENS IN AN ENVELOPE. Specimens are shipped to the MPHL through the MSDH courier system.
Additional Testing Information: The following organism types and subtypes are identified using the FilmArray RP: Adenovirus, Coronavirus 229E, Coronavirus HKU1, Coronavirus NL63, Coronavirus OC43, Human Metapneumovirus, Influenza A, Influenza A subtype H1, Influenza A subtype H3, Influenza A subtype H1-2009, Influenza B, Parainfluenza Virus 1, Parainfluenza Virus 2, Parainfluenza Virus 3, Parainfluenza Virus 4, Human Rhinovirus/Enterovirus, Respiratory Syncytial Virus, *Bordetella pertussis*, *Chlamydophila pneumoniae*, and *Mycoplasma pneumonia*.
Test Method: nested, multi-plex PCR
Limitations: The detection and identification of specific viral and bacterial nucleic acids from individuals exhibiting signs and symptoms of a respiratory infection aids in the diagnosis of respiratory infection if used in conjunction with other clinical and epidemiological information. The results of this test should not be used as the sole basis for diagnosis, treatment, or other management decisions. Negative results in the setting of a respiratory illness may be due to infection with pathogens that are not detected by this test or, lower respiratory tract infection that is not detected by a nasopharyngeal swab specimen. Positive results do not rule out co-infection with other organisms: the agent(s) detected by the Film Array RP may not be the definite cause of disease. Additional laboratory testing (e.g. bacterial and viral culture, immunofluorescence, and radiography) may be necessary when evaluating a patient with possible respiratory tract infection.

Test Specific Causes for Rejection: VTM received without a swab. Dry swab, calcium alginate swab, swabs in bacterial transport systems or other body fluids will not be tested.
Reference Value: Normally Not-Detected
Turnaround time: 3 business days
Critical Test Value: All positives and unsatisfactory results are phoned to Submitter immediately.

See Appendix J for complete collection instructions

RPR (Syphilis Serology Screening test)

Form 450 or 1252
Approved Submitters: MSDH facilities
Sample Type: Serum or whole blood without additives.
Volume/Amount: 5 mL whole blood, 2 mL serum.
Collection Guidelines: Plasma is unacceptable.
Storage Requirements: Ambient temperature
Shipping Requirements: Current shipping instructions for MSDH Contract Courier.
Additional Testing Information: RPR results will be reported as either 'Reactive', 'Non-reactive' or 'Invalid' for the detection of reagin antibodies. The MPHL will also continue to perform RPR titers on "Reactive" specimens. Due to the automation, RPR titer interpretations will be reported as the following: 1:1, 1:2, 1:4, 1:8, 1:16, 1:32, 1:64, 1:128, ≥ 1:256.
*Note that serologic tests for syphilis become reactive four to six weeks after infection or one to three weeks after appearance of the chancre. Tests performed before this time may be nonreactive.
Test Method: Automated Rapid Plasma Reagin (RPR).
Test Availability: Monday-Friday
Limitations: False positive RPR results may occur in autoimmune diseases and pregnancy. False negative RPR results may occur in immunocompromised individuals.
Test Specific Causes for Rejection: Specimen submitted in an EDTA, Sodium fluoride, or SST polymer gel blood collection tube; specimen hemolyzed; specimen other than serum (improper collection site); specimen lipemic; specimen greater than 5 days old; serum that has not been refrigerated.
Reference Value: Normally Non-Reactive
Turnaround time: 5 business days.
Critical Test Value: All reactive results on children less than 12 years old are phoned to Health Care Providers immediately.

S

Salmonella: see Enteric Culture or Isolates-Confirmation and Grouping

Shigella: see Enteric Culture or Isolates-Confirmation and Grouping

SARS-CoV-2 Molecular Testing

Form 1198
Approved Submitter: MSDH
Sample Type: Nasopharyngeal (NP), oropharyngeal (OP; ie, throat), nasal mid-turbinate, or nares/nasal in viral transport media or saline (PBS)
Volume/Amount: 2-3mL of either viral transport medium (VTM), Amies transport medium, or sterile saline

Collection Guidelines: All specimens must be placed in viral transport media for shipment.
Storage Instructions: Store at 2-8°C until shipment. Specimens should be submitted within72 hours of collection to the laboratory for optimal testing.
Shipping Requirements: Ship specimens with a cold pack in a RIGID outer container packaged in compliance with Biological Substance, Category B, UN3373 requirements.
Additional Test Information: Specimens should be collected from patients who are within 24-48 hours of symptom onset, have fever ≥ 100º F **AND** cough and/or sore throat (in the absence of a known cause other than influenza**).** Subtyping will be performed on all influenza positive specimens.
Test Method: Reverse Transcription Polymerase Chain Reaction (RT-PCR).
Test Availability: Monday-Friday
Limitations: The sensitivity of the assay is dependent on the stage of the illness when the sample is collected, the quality of the specimen submitted, and the test's performance characteristics. SARS-CoV-2 is likely at higher viral loads in the upper respiratory tract (eg, nasopharyngeal swab) during the first 3 to 5 days post onset of symptoms. The test is specific for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2); therefore, the results do not exclude the possibility of infection with other respiratory viruses. An undetected (ie, negative) result does not preclude infection with SARS-CoV-2 and should not be used as the sole basis for treatment or other patient management decisions. An inconclusive test result may be due to amplification inhibitors or inadequate numbers of organisms present in the specimen. An invalid test result may be due to specimen contamination or inappropriate collection. False negative results may occur if a specimen is improperly collected, transported or handled.
Test Specific Causes for Rejection: Specimen received at room temperature; specimen not received in viral transport media.
Reference Value: Normally Not Detected
Turnaround time: 3 business days.
Critical Test Value: All results of novel influenza strains are reported to Health Care Providers.
See Appendix P for complete collection instructions

St Louis Encephalitis Virus Antibodies : see Arbovirus Screening

Stool Culture: see Enteric Culture

Syphilis Serology : see RPR, TP-PA, FTA

T

TB EIA (QuantiFeron®TB Gold Plus)

Form 493
Approved Submitters: MSDH facilities and MPHL approved private submitters.
Sample Type: 1 Nil Antigen (Grey cap) tube, 1 TB1 Antigen (green cap) tube, 1 TB2 Antigen tube (yellow cap), and 1 Mitogen (Purple cap) tube should be collected per patient.
Volume/Amount Required: 1 mL (0.8 – 1.2 mL) of blood into each of the collection tubes (the black fill line on the side of the tube indicates the 1 mL fill mark). **Notes: Tube will fill slowly. Under or over-filling of the tubes outside of the 0.8 to 1.2 mL range may lead to erroneous results**.
Collection Guidelines: Blood collection tubes can be requested by contacting the TB Program. Antigens have been dried onto the inner wall of the blood collection tubes. Do not collect blood for QuantiFeron® testing on Friday unless correct incubation times can be assured.

Incubation and Storage Requirements: After filling, the contents of the tubes MUST be thoroughly mixed by firmly shaking. The tubes must be transferred to a 37°C ± 1°C incubator as soon as possible and within 16 hours of collection. Prior to incubation, maintain tubes at room temperature (22°C ± 5°C); Do not refrigerate or freeze the blood samples. Incubate the tubes **UPRIGHT** at 37°C for 16 to 24 hours. After incubation, tubes must be received within 72 hours and may be held between 4°C and 27°C. Do not centrifuge tubes prior to shipping.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier.
Test Method: Interferon Gamma Release Assay (IGRA).
Test Availability: Monday-Friday
Limitations: Cross-reactions may occur with *M. Kansasii*, *M. szulgai* or *M. marinum*. Indeterminate results may occur due to incorrect incubation, transport or handling of specimens. Test results should be used with epidemiological history, medical status and diagnostic evaluations when diagnosing or excluding tuberculosis disease and assessing the probability of latent tuberculosis infection. Test performance has not been evaluated for individuals with compromised or altered immune systems, individuals younger than 17 years or pregnant women.
Test Specific Causes for Rejection: Specimen level not close to the indicator line on collection tube (blood level should be within ± 10% of black line); specimen not incubated properly; specimen received refrigerated, frozen or spun; specimen grossly hemolyzed.
Reference Value: Normally Negative
Turnaround time: 5 business days.

See Appendix M for complete instructions

TP-PA (Syphilis Confirmatory testing)

Form 402 or 1252
Approved Submitters: MSDH facilities
Sample Type: serum
Volume/Amount Required: 5 mL whole blood in plain (red top) tube or 2 mL serum.
Collection Guidelines: Plasma is unacceptable.
Storage Requirements: see RPR, Serological Test for Syphilis, for sample collection and storage.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier.
Additional Test Information: TP-PA is performed when the RPR screening assay is reactive; this test is not performed as a stand-alone assay.
Test method: *Treponema pallidum* particle agglutination.
Test Availability: Monday-Friday
Limitations: TPPA tends to remain reactive following treponemal infection and should not be used to evaluate response to therapy.
Test Specific Causes for Rejection: Improper collection tube (EDTA, Sodium Fluoride, and SST polymer gel); specimen hemolyzed; improper collection site; specimen other than blood or serum; specimen lipemic.
Reference Value: Normally Non-Reactive
Turnaround time: 5 business days
Critical Test Value: <u>All reactive results on children less than 12 years old</u> are phoned to Health Care Providers immediately.

Triglycerides: see Chemistry Panel

Tuberculosis (TB) and Other *Mycobacteria* Culture

Form 416 or 1252

Approved Submitters: MSDH facilities and private facilities approved by the MSDH TB Program.
Specimen Types and Collection Guidelines:
Sputum A series of three specimens is recommended. Collect the specimens in the early morning on consecutive days. A volume of 3 to 10 mL is adequate for each specimen. Induced (or nebulized) sputum specimens are usually very watery, and unless indicated on the specimen submittal form, may be mistaken for saliva, which is an inappropriate specimen. Sputum swabs are unsatisfactory. Do not use any transport medium. Refrigerate specimen if transportation is delayed more than one day.
Bronchoalveolar Lavage Fluids and Bronchial Washings Collect at least 5 mL in a sterile container. Avoid contaminating bronchoscope with tap water. Saprophytic mycobacteria may produce false-positive culture or smear results. Refrigerate specimen if transportation is delayed more than one day.
Gastric lavages Collect 5 to 10 mL of fluid in a sterile container without a preservative, either early in the morning or eight hours after eating or drug therapy. Neutralize specimen within four hour of collection with 100 mg of sodium carbonate powder (Na_2CO_3). Do not use any transport medium.
Tissue (Lymph Node, skin, other biopsy material). Collect 1 g of tissue, if possible, aseptically. Select a caseous portion, if available. Do not immerse the specimen in saline (or other fluid) or wrap in gauze. Freezing decreases yield. A sterile container with a small amount of sterile water or sterile saline (to keep the specimen moist) is acceptable. Do not use any transport medium, preservative or fixative. Tissues in formalin are not acceptable.
Urine Collect catheterized or mid-stream urine voided in early morning. A minimum of 40 mL is recommended. Submit a series of three specimens, taken on three different days. Twenty-four hour cumulative specimens are unsatisfactory. Do not use any transport medium. Refrigerate specimen if transportation is delayed.
Feces Only fecal specimens from confirmed or suspected AIDS or other immunocompromised patients will be accepted. For firm specimens, collect approximately 1 gram feces. For more liquid specimens, collect 10-15 mL minimum in a sterile container.
CSF Submit CSF in sterile container. A minimum of 2 mL of CSF is required for culture and direct smear. Specimens submitted with a volume less than 2 mL will be processed for culture only. Do not use any transport medium. Use sputum mailer or equivalent meeting safety requirements.
Abscess Contents, Aspirated Fluid, Skin Lesions, Wounds Aspirate as much material as possible into a syringe with a luer tip cap. Place fluid into a sterile container. Specimens collected on swabs will be rejected. **Swabs are not recommended for the recovery of mycobacteria.**
Reference Isolates Submit pure culture of mycobacteria on Lowenstein Jenson (LJ) slant or other appropriate solid medium demonstrating good growth. Specimen submitted in liquid culture must be Acid Fast Bacilli smear-positive. Label the media with the patient's name and package carefully. If media is liquid, pack specimen with enough absorbent material to absorb the entire contents in case of breakage or leakage. **Ship specimens to the MPHL according to current shipping guidelines for Category A substances.** State site/source from which isolation was made and date of collection for the original, cultured specimen.

Additional Collection and Shipping Information:

- Please collect samples according to MSDH TB Program guidelines to prevent redundant testing.
- Sterile, leak-proof specimen containers are available upon request for the collection of clinical specimens requiring acid-fast bacilli stain and culture.
- Clinical specimens should be shipped to the MS PHL within 24 hours of collection for optimal recovery.
- Clinical specimens older than eight (8) days are unsatisfactory and will not be processed.
- If *M. haemophilum* or *M. genavense* is suspected, please contact the TB Lab prior to shipping the specimen(s) to insure appropriate isolation procedures are utilized for these organisms.
- **Blood** and **Bone Marrow** specimens are not accepted.

Test Methods and Procedures
Digestion and Decontamination: NALC/NaOH
Microscopic TB exam: Fluorescent and/or Ziehl Neelsen stain.

Culture: Clinical specimens are cultured using the automated Mycobacteria Growth Indicator Tube (MGIT) system and Lowenstein-Jensen slants.

Mycobacteria Species Identification

Species identification is accomplished using high-pressure liquid chromatography (HPLC) and/or nucleic acid probe tests.

Drug Susceptibility for *M. tuberculosis complex*

Primary drug susceptibilities are automatically performed on the first isolate of *M. tuberculosis complex* from an initial new positive patient and repeated at two month intervals as long as patient remains culture positive. Testing is performed using the BACTEC MGIT 960 method. Testing can only be performed on pure cultures of *M. tuberculosis complex*.

Test Availability: Monday-Friday

Limitations: Organisms must be viable for culture studies. Delay in transport of specimen could compromise isolation of organism.

Test Specific Causes for Rejection: Unprocessed specimens older than 8 days from date of collection; gastric aspirates that were not buffered with 100 mg of sodium carbonate within 4 hours of specimen collection; pooled sputum or urine specimens; blood or bone marrow specimens; stool specimens from patients who are not known to be HIV positive; concentrates shipped at ambient temperature.

Reference Value: Normally Negative

Turnaround time: AFB smear results in 2 business days; clinical specimen culture isolation results in 14-60 days; reference isolate identification in 5-25 days; *Mycobacterium tuberculosis complex* drug susceptibility testing in 30-75 days**.**

Critical Test Values: Acid Fast Bacilli positive smears on new patients in last six months, positive MTB/RIF direct PCR test result and drug resistant *M.tuberculosis complex* results are phoned to Health Care Providers within 24 hours.

Direct PCR test for *M. tuberculosis complex* (MTB/RIF)

Form 416 or 1252

Approved Submitters : MSDH facilities and private facilities approved by the MSDH TB Program

Specimen Types and collection guidelines:

The Cepheid GeneXpert assay is automatically performed on smear positive respiratory specimens from new patients with no previous history of tuberculosis infection in last twelve months. The MTB/RIF assay may also be performed on smear negative respiratory specimens from new patients upon special request by the treating physician. Document all assay special requests on the specimen submittal form to ensure that test is performed.

The MTB/RIF test is approved only for respiratory specimens (sputum, tracheal aspirates, and bronchial specimens) or the processed sediment (concentrates) of such specimens. Processed sediment (concentrates) requirements: Only respiratory specimen concentrates prepared from approved adaptions of the NALC-NaOH or NaOH decontamination protocols described by the CDC will be accepted. Resuspension fluids other than phosphate buffer (67mM, pH 6.8) or bovine albumin should not be used. Final specimen concentrations of NaOH other than 1 % to 1.5% should not be used for processing specimens to be tested. Concentrates must be received on cold packs within 7 days of digestion/decontamination and must have been kept cold the entire 7 days.

Test Method: Polymerase Chain Reaction (PCR)

Test Availability: Monday-Friday

Limitations: The MTB/RIF assay is appropriate only for patients who are suspected of having pulmonary TB based on clinical evaluation. The MTB/RIF test must be performed and evaluated in conjunction with culture and clinical symptoms. Results may be affected by antecedent or concurrent antibiotic therapy. A negative MTB/RIF test does not exclude the possibility of isolating *M. tuberculosis complex* on culture. Inhibitory substances or contamination present in some specimens may prevent amplification and cause unreliable test results. A positive MTB/RIF test does not confirm the

viability of mycobacteria. All results are presumptive and must be confirmed by standard practices of identification. Testing is limited to respiratory specimens processed using the NALC-NaOH or NaOH decontamination protocols.
Test Specific Causes for Rejection: Unprocessed sputum or bronchial specimen received more than 3 days after the date of collection if stored at room temperature and more than 7 days if stored at 2-8°C; sputum or bronchial specimen sediments not received within 7 days after digestion and decontamination; non-respiratory specimens; specimen with obvious food particles or other solid particulates; grossly bloody specimens; specimens from patients known to be culture positive for MTBc or non-tuberculosis mycobacterium within the past 12 months; specimens that were concentrated by methods other than the current adaptation of the NALC-NaOH or NaOH decontamination protocols; sediments not received on cold packs; specimens that appear to be saliva; sputum specimens from patients currently being treated for TB for more than 3 days; requests for patients who are less than 18 yrs. of age.
Reference Value: Normally Not Detected
Turnaround time: 3 business days.
Critical Test Values: Positive results for MTB, with and without rifampin resistance are phoned to Health Care Providers immediately.

V

Vaccinia (Non-variola Orthopox) by PCR

Form 402 or 1252
Approved Submitters: MSDH Facilities and private submitters approved by the MSDH Office of Epidemiology.
Sample Type: Vesicular swabs and scabs from crusted lesions.
Collection Guidelines: See appendix M
Storage Requirements: Samples may be stored at room temperature.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier.
Label the package to the attention of Molecular Diagnostics.
Additional Test Information: Please note the requested test as PCR for Vaccinia. Do not place swab or scab into transport medium; the specimen must be kept dry.
Test Method: Polymerase Chain Reaction (PCR).
Test Availability: Monday-Friday. With notification Saturday and Sunday testing is available.
Limitations: Reliable results are dependent on appropriate specimen collection and transport procedures.
Reference Value: Normally Not Detected
Turnaround time: **3** business days.
Critical Test Value: All results are phoned to Health Care Providers immediately.

See Appendix L for complete collection instructions

Varicella-Zoster Virus (VZV) by PCR

Form 402 or 1252
Approved Submitters: MSDH Facilities and private submitters approved by the MSDH Office of Epidemiology
Sample Type: Vesicular swabs and scabs from crusted lesions.
Collection Guidelines: See Appendix L
Storage Requirements: Samples may be stored at room temperature.
Shipping Requirements: Current shipping instructions for MSDH Contract Courier.
Label the package to the attention of Molecular Diagnostics.
Additional Test Information: Please note the requested test as PCR for VZV. Do not place swab or scab into transport medium; the specimen must be kept dry.

Test Method: Polymerase Chain Reaction (PCR).
Test Availability: Monday-Friday
Limitations: Reliable results are dependent on appropriate specimen collection and transport procedures.
Reference Value: Normally Not Detected
Turnaround time: 2 business days.
Critical Test Value: All results are phoned to Health Care Providers immediately.
See Appendix K for complete collection instructions

Vibrio: see Cholera

W

West Nile Virus Antibodies: see Arbovirus Screening

Whooping Cough: see Pertussis

Y

Yersinia pestis

Form 402 or 1251
Approved Submitters: MS Sentinel Laboratories, Law Enforcement, MSDH Office of Emergency Preparedness and Response.
Sample Type: Clinical Specimens- aseptically collected lymph node tissue or aspirate, tissue from liver, spleen, or lung, whole blood in EDTA, sputum, pleural fluid, and transtracheal aspirates or washes.
Culture- pure growing culture on a appropriate agar slant in a screw capped tube; blood culture.
Environmental samples submitted by law enforcement personnel.
Volume/Amount Required: Sputum and all liquid specimen volumes must equal at least 1 mL.
1 gram of tissue.
Collection Guidelines:

Tissue	Tissue pieces should be collected and kept moist. Transport in sterile container at room temperature within 1 hour of collection.
Whole Blood (PCR only)	Allow any size EDTA (lavender top) tube or serum separator tube to completely fill, half full minimum.

Storage Instructions: Clinical specimens should be stored at 2-8°C. Isolates and environmental samples should be stored at room temperature.
Shipping Requirements: Ship all clinical specimens on cold packs within 24 hours of collection using current shipping guidelines for biological substances, Appendix E. Ship all isolates at room temperature using current shipping guidelines for biological substances, Appendix E.
Additional Test Information: Notify MPHL Bioterrorism Coordinator or MPHL Special Microbiology Section at 601-576-7400.
Test Method: Conventional culture and Polymerase Chain Reaction (PCR).
Test Availability: Tested Monday-Friday. With notification, Saturday and Sunday testing available.
Limitations: PCR: If inhibitors are present in a DNA extraction, PCR assays may produce a false negative result. A false negative result may occur if a sample is improperly collected, transported or handled. False

negative results may occur if inadequate numbers of organisms are present in the sample. Conventional Culture and Biochemicals: Organism must be viable for testing.
Reference Value: Normally Not Detected
Turnaround time: A preliminary report is available within 24 hours. A final report is available within 10 days.
Critical Test Value: All test results are reported to submitter.

See Appendix E for more shipping information

Z

Zika Virus: see Arbovirus IgM Antibody Testing and Arbovirus RNA Virus detection by RT-PCR

ENVIRONMENTAL SERVICES
TEST DESCRIPTIONS

Environmental Microbiology

Drinking Water Compliance sampling must be approved by the MSDH Bureau of Public Water Supply. Submission of public water supply samples will not be accepted from private individuals**.**

For status of regulated water systems, information on remedial actions for unsatisfactory samples, sample results and to register complaints contact the Bureau of Public Water Supply at 601-576-7518.

Drinking Water Microbiology – Coliform Presence/Absence test, MPN
Form 425, Form 427 Monitoring

- Submit sample in sterile bottle containing sodium thiosulfate provided by laboratory.
- Do not rinse bottle. Fill to 100 mL fill line as marked on the bottle. Samples will be rejected when sample volume is insufficient.
- Use the appropriate form and include all information requested on the form. Samples will be rejected should information be incomplete.
- Form 425 is for use by Public Water Systems (PWS)
- Form 427, Monitoring, is for use by MSDH Environmental Wastewater Region Offices, Central Office Food Protection, and Private (fee paid) Submitters.
- **Place appropriate matching barcode labels on sample bottle and form.** Barcode labels are provided to each Public Water System (PWS), MSDH Environmental Wastewater Region Office, and Central Office Food Protection by the Bureau of Public Water Supply. Place sample and form in shipping box.
- If a barcode is not available, matching unique ID numbers must be written on the bottle and form or the sample will be rejected.
- Samples may be shipped in cardboard boxes available from county health departments.
- Date and sign Custody Seals and place on box as directed in instructions on pages 83-84.
- Place Lab Mailing Label #477 on shipping box.
- Samples may be dropped off at country locations Monday through Wednesday for delivery to the laboratory via courier. The lab will not accept **routine** bacteriological samples on Friday or Saturday. Contact the Bureau of Public Water Supply for boil water and other special sample types.
- Samples may be delivered directly to the laboratory sample receipt room Monday through Thursday no later than 4:00 pm.
- Samples received in the laboratory more than 30 hrs after collection will be rejected.

Bottled Water and Ice
Form 411

Fee for non-health department bottled water/ice plant samples by prearrangement with the laboratory and program office. For bottled water cap and container submissions contact the Environmental Microbiology Laboratory.

Bottled Water - Source Water - Coliform Presence/Absence test

- Submit plant source water sample in sterile bottle containing sodium thiosulfate provided by the laboratory.
- Do not rinse bottle. Fill to 100 mL fill line as marked on the bottle. Samples will be rejected when sample volume is insufficient.
- Use Form 411 and complete for all information requested. Samples will be rejected should information be incomplete. **Place appropriate matching barcode labels on each sample bottle and form.** Barcode labels are provided by the Public Health Laboratory. Place sample and form in shipping box.
- Samples may be shipped in cardboard water sample boxes available from county health departments. Place Lab Mailing Label #477 on shipping box.
- Samples must be received and tested within 30 hours of collection.

Bottled Water - Product Water – Total Coliform Most Probable Number (MPN) test

- For each product sample submit ten (10) product water containers; either ten sterile bottles provided by the laboratory filled with product collected throughout the day's production run, or ten unopened retail containers selected at random from the lot/batch.
- Do not rinse lab supplied bottle. Fill to 100 mL fill line as marked on the bottle. Samples will be rejected when sample volume is insufficient.
- For <u>each</u> container submitted, complete a form 411 for all information requested. **Include batch number, lot number or production date on each form.** Samples will be rejected should information be incomplete.
- **Place appropriate matching barcode labels on <u>each</u> of the ten (10) sample bottles and forms.** Barcode labels are provided by the Public Health Laboratory.
- Samples may be shipped, Monday through Wednesday only, in cardboard water sample boxes available from county health departments. Place Lab Mailing Label #477 on shipping box.

Ice - Coliform Presence/Absence test

- Submit ice product sample in two (2) 100 mL sterile bottles containing sodium thiosulfate provided by the laboratory. Two bottles allow ample sample after volume change upon melting.
- Do not rinse bottle. Use Form 411 and complete for all information requested. Samples will be rejected should information be incomplete. **Place appropriate matching barcode labels on each sample bottle and form.** Barcode labels are provided by the Public Health Laboratory.
- Sample and form may be shipped, Monday through Wednesday only, in cardboard water sample boxes available from county health departments.
- Samples must be received and tested within 30 hours of collection.

Complaint/Monitoring samples must be submitted by an environmentalist.

The Bottled Water Program is monitored and regulated by the Office of Environmental Health. For complaints, contact the Office of Dairy and Bottled Water at 601-576-7606.

Recreational Surface Water – A1 Test

Form 410

Fee for non-health department sources by prearrangement with the laboratory.

- Contact the laboratory one week before samples are to be submitted.
- Submit sample in sterile bottle containing sodium thiosulfate provided by the laboratory.
- Do not rinse bottle. Fill to 100 mL fill line as marked on the bottle. Samples will be rejected when sample volume is insufficient.
- Use the appropriate form and include all information requested on the form. Samples will be rejected should information be incomplete. **Place appropriate matching barcode labels on sample bottle and form.** Barcode labels are provided by the Public Health Laboratory.
- Place the sample bottle in a large plastic bag; close with large rubber band; place inside bag that lines shipper; add crushed ice to fill remaining space in shipper. Shipper may be blue polyfoam shipper supplied by lab, or insulated shipper provided by the submitter. Do not allow sample bottle to have direct contact with ice. Protect sample submission form from water/ice by placing in lid or attaching to the outside of the shipping container.
- Temperature control identical to sample must accompany sample.
- Samples must be maintained at 10˚C or below until analysis.
- S**pecial Note: Samples not tested within 8 hours of collection will be reported with a disclaimer.**
- Samples will be rejected if received 30 hours after collection.
- Samples may be shipped, Monday through Wednesday only, through the local health department by courier or delivered directly to the Public Health Laboratory. Place Lab Mailing Label #477 on shipping container.

Autoclave Sterility Check
Form 363
Health Department clinics and state certified private drinking water laboratories only.

Health Department Clinics: Submit test ampoules that have been treated according to the Monthly Autoclave Sterility Check Instructions in the Public Health Nursing Manual.

Drinking Water Laboratories: Submit test ampoules that have been treated according to instructions provide by the MPHL Lab Certification Officer.

- **Write lot number and expiration date of ampoule on completed form 363.**
- Wrap treated ampoules carefully in packing material, place the ampoules inside a zip-lock biohazard bag and place completed Form 363 in the outside pocket of the bag for shipping.
- Ship the same day as tested in a 2" X 5" unlined mailer, available from the laboratory. Label mailer, “Attention: Environmental Microbiology.”
- Ship Monday through Wednesday only.
- This is a 48 hour test. Please refer to holiday closure schedules before submitting.

Heterotrophic Plate Count
Form 427
State certified private drinking water laboratories only- by prearrangement with the laboratory

- Submit sample in sterile bottle containing sodium thiosulfate provided by the laboratory.
- Do not rinse bottle. Fill to 100 mL fill line as marked on the bottle.

- Temperature control identical to sample must accompany sample.
- Samples must be maintained at 4˚C or below. Transport on ice or frozen cold packs. Protect sample bottle by placing in a sealed plastic bag. Do not allow sample bottle to have direct contact with ice.
- Complete Form 427, Drinking Water Microbiology Monitoring Sample. Write "HPC-Simplate MPN" on form. Form must include date and time of collection.
- Protect sample submission form from water/ice by placing in shipping container lid or attaching to the outside of the shipping container.
- Sample must be received within 24 hours of collection.

Dairy Testing

Milk Program environmentalists only

- Milk sampling schedules are arranged by the Environmental Microbiology Supervisor and the Milk Environmentalists. Routine milk samples are not accepted Friday through Sunday. Samples must be received within 60 hours of collection. Refer to Milk Program for further instructions, interpretation of results, and regulatory actions.

Raw Milk – Aerobic Plate Count, Coliform count, Microbial Inhibitor Assay, Antibiotic Residue, Electronic Somatic Cell Count, Somatic Cell Count
Form 431

he submitter, complete and apply a lab supplied, Lab Sample ID label to top of sample vial

- Submit in plastic vial (available from lab) no more than three fourths full.
- When a sample vial does not have a vial top label applied by t for each sample and temperature control.
- Place sample vials in a large plastic bag; close with large rubber band; place inside bag that lines shipper; add crushed ice to fill remaining space in blue polyfoam shipper supplied by lab.
- Include temperature control in same size/type vial.
- Complete Form # 431 and place between outer and inner lids of shipper.
- Sample must be maintained at 0-4.5ºC until analysis. Sample may not be frozen.

Pasteurized Milk and Dairy Products (Finished Product) - Aerobic Plate Count, Coliform Count, Microbial Inhibitor assay, Antibiotic residue, Phosphatase, Butterfat, Freezing Point
Form 430

- Submit in unopened retail container.
- Ship in blue polyfoam shipper using procedure described under Raw Milk.
- Include temperature control which must be at least one half the size of the largest container.
- Complete Form # 430 and place between outer and inner lids of shipper.
- Sample must be maintained at 0-4.5ºC until analysis. Sample may not be frozen.

Dairy Water-Well sample -Presence/Absence Coliform test
Glycol and Sweetwater-Multiple Tube Fermentation
Form 146

- Contact the Environmental Microbiology laboratory the day before submitting samples to allow time for media incubation.
- Submit sample in sterile bottle containing sodium thiosulfate provided by laboratory.
- Do not rinse bottle. Fill to 100 mL line or no higher than the curve in the neck of the bottle.
- Use the appropriate form and include all information requested on the form. Samples will be rejected should information be incomplete.
- **Place appropriate matching barcode labels on sample bottle and form.** Barcode labels are provided by the Laboratory.
- Place sample vials in a large plastic bag; close with large rubber band; place inside bag that lines shipper; add crushed ice to fill remaining space in blue polyfoam shipper supplied by lab.
- Include temperature control in same size sample bottle.
- Complete Form # 146 and place between outer and inner lids of shipper.
- Samples must be tested within 30 hours of collection.
- Sample must be maintained at 0- 4.5ºC until analysis. Sample may not be frozen.

Environmental Inorganic Chemistry Testing for Private Submitters

Lead and Copper in Drinking Water

Form 478

Samples may be submitted by private citizens. Results cannot be used for compliance purposes. A fee will be charged.

- Contact the Public Health Lab Office Manager to order sample collection container, submission form and mailer.
- Before collection materials are sent to the requestor, the laboratory must receive a check payable to the Public Health Laboratory for $20 for **each** sample to be tested. Each sample will be tested for both lead and copper.
- Collect sample, complete sample submission form 478 for each sample. Submit in mailer per instructions provided.
- If multiple samples are sent, number or identify each sample according to location, time collected, etc.
- Samples may be shipped by courier from county health departments.

After testing, the laboratory will report results by mail to the submitter.

Drinking Water Compliance Testing for Public Water Systems
Environmental Inorganic Chemistry

Sampling must be approved and scheduled by the MSDH Bureau of Public Water Supply. Submission of public water supply samples will not be accepted from private individuals**.**

For status of regulated water systems, information on remedial actions for unsatisfactory samples, sample results and to register complaints contact the Bureau of Public Water Supply at 601-576-7518.

Drinking Water Fluoride
Form 428

- Submit sample in sterile bottle provided by laboratory.
- Do not rinse bottle. Fill to 100 mL fill line as marked on the bottle.
- Use the appropriate form and include all information requested on the form. Samples will be rejected should information be incomplete. **Place appropriate matching barcode labels on sample bottle and form.** Barcode labels are provided to each Public Water System (PWS) by the Bureau of Public Water Supply. Place sample and form in shipping box.
  - If a barcode is not available, matching unique ID numbers must be written on the bottle and form or the sample will be rejected.
- Samples may be shipped in cardboard boxes available from county health departments.
- Date and sign Custody Seals and place on box as directed in instructions pages 83 & 84.
- Place Lab Mailing Label #477 on shipping box.

Fluoride	**Method:** QC10-109-12-2A
	Sample Size: 100 mL
	Container: Plastic Container
	Preservation: N/A
	Hold time: 28 Days

Bromate & Chlorite	**Method:** EPA 300.1
	Sample Size: 100 mL
	Container: Plastic Container
	Preservation: N/A
	Hold time: 28 days

Inorganics	**Method:** EPA 200.8
Beryllium	**Sample Size:** 1 Quart
Chromium	**Container:** Plastic Container
Nickel	**Preservation:** N/A
Cobalt	**Hold time**: 180 Days
Arsenic	
Selenium	
Molybdenum	
Cadmium	

Antimony Barium Thallium	

Mercury	**Method:** EPA 245.1
	Sample Size: 1 Quart
	Container: Plastic Container
	Preservation: N/A
	Hold time: 28 Days

Nitrates/Nitrites	**Method: QC** 10-107-04-1-C
	Sample Size: 100 mL
	Container: Plastic Container
	Preservation: $\leq$ 4ºC
	Hold time: 48 Hours

Trace Metals	**Method:** EPA 200.8
	Sample Size: 1 Quart
	Container: Plastic Container
	Preservation: N/A
	Hold time: 60 Days

Cyanides	**Method:** ME355.01
	Sample Size: 40 mL
	Container: Amber glass Container
	Preservation: 1 mL 1 N NaOH, maintain at $\leq$ 4ºC
	Hold time: 7 Days

Cyanides	**Method:** QC10-204-00-1-X
	Sample Size: 125 mL
	Container: Amber Plastic Container
	Preservation: Ascorbic Acid supplied in collection container, NaOH (pH > 12.5) added in field, maintain at $\leq$ 4ºC
	Hold time: 14 Days

Physical Chemistry/Inorganics	**Method:** EPA 300.0
Chloride Sulfate Fluoride	**Sample Size:** 1 Quart
	Container: Plastic Container
	Preservation: N/A
	Hold time: 28 Days

Physical Chemistry/Metals	**Method:** EPA 200.8
Iron Magnesium Manganese Calcium Sodium	**Sample Size:** 1 Quart
	Container: Plastic Container
	Preservation: N/A
	Hold time: 180 Days

Potassium	

Lead & Copper	**Method:** EPA 200.8
	Sample Size: 1 Liter
	Container: Plastic Container
	Preservation: N/A
	Hold time: 180 Days

Uranium	**Method:** EPA 200.8
	Sample Size: 1 Quart
	Container: Plastic Container
	Preservation: N/A
	Must be received within 5 days of collection
	Hold time: 6 months

Drinking Water Compliance Testing for Public Water Systems
Environmental Organic Chemistry

Sampling must be approved and scheduled by the MSDH Bureau of Public Water Supply. Submission of public water supply samples will not be accepted from private individuals**.**

For status of regulated water systems, information on remedial actions for unsatisfactory samples, sample results and to register complaints contact the Bureau of Public Water Supply at 601-576-7518.

EDB, DBCP	**Method: EPA 504.1 Rev 1.1**
1,2-Dibromoethane (EDB) 1,2-Dibromo-3-Chloro-Propane (DBCP)	**Sample Size:** 40 mL
	Container: 40 mL vials; Teflon-lined caps
	Preservation: 3 mg of sodium thiosulfate, 4ºC
	Hold Time: 14 days

Glyphosate	**Method: EPA 547**
N-phosphonomethyl glycine	**Sample Size:** 60 mL
	Container: 60 mL glass; Teflon lined septum
	Preservation: 100 mg/L sodium thiosulfate, 4ºC
	Hold Time: 14 Days

Organohalide Pesticides:	**Method: EPA 505, Rev. 2.1**
Chlordane	**Sample Size**: 40 mL
Endrin	**Container**: 40 mL glass; Teflon lined septum
Heptachlor	**Preservation**: 3 mg sodium thiosulfate, 4ºC
Heptachlor Epoxide	**Hold Time**: 14 Days (7 days for heptachlor)
Hexachlorobenzene	
Hexachlorocyclopentadiene	
Lindane	
Methoxychlor	
Toxaphene	
Aroclors	

Organic Compounds	**Method: EPA 525.2 Rev.2.0**
Alachlor Atrazine Dieldrin Di(2-ethylhexyl)adipate Di(2-ethylhexyl)phthalate Endrin Heptachlor Heptachlor Epoxide Hexachlorobenzene Hexachlorocyclopentadiene Lindane (gamma-BHC) Methoxychlor Simazine Trifluralin	**Sample Size**: 1 Liter
	Container: 1 L amber; Teflon lined caps
	Preservation: 40-50 mg sodium sulfite, 2 mL of 6N hydrochloric acid at sampling, 4ºC
	Hold Time: 14 days

Carbamates	**Method: EPA 531.2 Rev.1.0**
Carbofuran Oxamyl	**Sample Size:** 15 mL
	Container: 60 mL Amber glass; Teflon lined septum
	Preservation: 560 mg potassium dihydrogen citrate / 6 mg sodium thiosulfate, <10ºC,
	Hold Time: 28 Days

Diquat, Paraquat	**Method: EPA 549.2**
Diquat Paraquat	**Sample Size**: 250 mL
	Container: ≥250 mL brown plastic bottle
	Preservation: 4ºC, 100 mg/L of sodium thiosulfate, dark, H_2SO_4 pH <2
	Hold Time: 7 Days

Regulated Herbicides:	**Method: EPA 515.4**
2,4-D Dalapon Dinoseb Pentachlorophenol Picloram 2,4,5-TP (Silvex)	**Sample Size**: 40 mL
	Container: 60 mL Amber glass; Teflon lined septum
	Preservation: 4ºC, dark, 3 mg of Sodium Sulfite
	Hold Time: 14 Days

Polychlorinated Biphenyls	**Method: EPA 505, Rev. 2.1**
Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260	**Sample Size**: 40 mL
	Container: 40 mL glass; Teflon lined septum
	Preservation: 3 mg sodium thiosulfate, 4ºC
	Hold Time: 14 Days

Adipate/Phthalates	**Method: EPA 525.2 Rev.2.0**
Di(2-ethylhexyl)adipate Di(2-ethylhexyl)phthalate Simazine Alachlor Atrazine	**Sample Size**: 1 Liter
	Container: 1 L Amber glass, Teflon lined caps
	Preservation: 40-50 mg/L sodium sulfite, 2 mL of 6N hydrochloric acid at sampling, 4ºC
	Hold Time: 14 days

Polycyclic Aromatic Hydrocarbons	**Method: EPA 550.1**
Benzo(a)pyrene	**Sample Size**: 1 Liter
	Container: 1 L Amber glass; Teflon lined caps
	Preservation: 4ºC, 100 mg/L sodium thiosulfate, pH<2 HCL
	Hold Time: 7 days

Trihalomethanes	**Method: EPA 524.2 Rev. 4.2**
Chloroform Bromodichloromethane Dibromochloromethane Bromoform	**Sample Size:** 40 mL
	Container: 40 mL Amber glass vials; Teflon-faced silicone septum
	Preservation: 4ºC, 5 mg sodium thiosulfate
	Hold time: 14 days

Haloacetic Acids	**Method: EPA 552.2**
Chloroacetic acid Bromoacetic acid Dichloroacetic acid Trichloroacetic acid Dibromoacetic acid	**Sample Size**: 40 mL
	Container: 60 mL Amber glass vials; Teflon lined septum
	Preservation: 4ºC, dark , 100 mg/L ammonium chloride
	Hold Time: 14 Days

Volatile Organic Compounds	**Method: EPA 524.2 Rev. 4.2**
1,2-Dichloropropane Methylene Chloride Ethylbenzene Styrene Tetrachloroethylene Toluene 1,2,4-Trichlorobenzene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethylene Vinyl chloride Xylenes (o-, m-, and p-) Benzene Carbon tetrachloride Chlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichloroethane 1,1-Dichloroeth(yl)ene cis-1,2-Dichloroethylene trans-1,2-Dichloroethylene	**Sample Size:** 40 mL
	Container: Amber 40 mL screw-cap vials; Teflon-faced silicone septum
	Preservation: 4ºC, 25 mg of powdered ascorbic acid, 2 drops 1:1 HCL
	Hold time: 14 days

Suspected Drinking Water Contamination

Individuals concerned about drinking water supply contamination should contact the MSDH Office of Emergency Preparedness and Response (OEPR) at 601-576-7400 or the Department of Health Bureau of Public Water Supply at 769-798-4258. The MPHL in coordination with OEPR and Water Supply will perform analyses for pH, nitrites/nitrates, chlorides, sulfates, metals, volatile organic contaminants, fluoride, cyanides, pesticides, total coliform and *E. coli*. The MPHL tests only drinking water samples; all other water samples should be directed to the appropriate testing agency.

APPENDIX A

SUPPLIES AVAILABLE FROM LABORATORY
(* Denotes Fee to Non-Health Department Sources)

All orders must be placed on MSDH form 1152.

Supply Item	Quantity
*TB-EIA, Quantiferon® Plus, collection tubes (Set of 4 per patient)	Request quantity
*Enteric Culture Bottle	Request quantity
*Venous Blood Lead Collection Supplies	Request quantity
*Gen-Probe Aptima GC/CT Collection Kits	Request quantity
*Lead and Copper Drinking Water Container	Request quantity
*Parasite Bottle	Request quantity
Raw Milk Sample Vial- Sterile 1.5 oz	Request quantity
Specimen Biohazard Bag (Absorbent included)	Package of 50 or 500/case
Specimen transport container	Request quantity
TB Sputum Container	Pack of 10
Water Bottle containing sodium thiosulfate, Sterile with 100 mL fill line	Box of 12 bottles Request number of boxes needed
Water Bottle containing sodium thiosulfate, Sterile with 100 mL fill line	Case of 6 boxes Requests number of cases needed
Water Boxes: 1. Two sample box (4 5/16 X 3 5/8 X 2 1/8) Accommodates 2 samples 2. Six sample box (6 ¾ X 4 ¼ X 5) Accommodates 6 samples 3. Twelve sample box - (4 ½ X 8 ¼) Accommodates 12 samples	 Request number of <u>empty</u> boxes needed or case of approximately 50 <u>empty</u> boxes Request number of <u>empty</u> boxes needed Request number of <u>empty</u> boxes needed

APPENDIX B

PRINTED FORMS AVAILABLE FROM LABORATORY

Form Number	Form Description	Quantity
146	*Dairy Water Microbiology*	Request quantity
363	*Autoclave Sterility Check*	Request quantity
364	*HIV*	Pkg of 100
402	*Miscellaneous*	Pkg of 200
410	*Surface Water*	Request quantity
411	*Bottled Water*	Request quantity
416	*TB Culture*	Pkg of 100
425	*Water Microbiology*	Pkg of 100
427	*Water Microbiology Monitoring*	Pkg of 100
428	*Fluoride*	Pkg of 50
430	*Finished Product Milk*	Request quantity
431	*Raw Milk*	Request quantity
433	*Rabies*	Request quantity
450	*RPR*	Pkg of 100
477	*Lab Mailing Label*	Pkg of 100
478	*Lead/Copper in drinking water Private submitter*	Request sample kit quantity
493	*TB EIA*	Request quantity
499	*Hepatitis B*	Pkg of 50
930	*Influenza And SARS-CoV-2 Surveillance*	Request quantity from Epidemiology
984	*Chlamydia/ GC by NAAT*	Request quantity
8021	*Arbovirus Panel*	Pkg of 25

FORMS AVAILABLE ONLINE

Form Number	Form Description	URL
1252	*Clinical Specimen Submission Requisition*	https://msdh.ms.gov/page/14,0,188,614.html
1251	*Clinical Select Agent Rule-Out Submission Requisition*	
1198	*SARS-CoV-2 Testing Requisition*	
1140	*Mosquito Testing Requisition*	
1042	*CRE, CRPA and CRAB Isolate Requisition*	
8021	*Arbovirus Panel Request Form*	
364	*HIV Antibody Requsition*	
930	*Influenza and SARS-CoV-2 Surveillance Test Requisition*	
402	*Miscellaneous Laboratory Examination Request Form*	
416	*Mycobacteriology Culture Request Form*	
493	*TB EIA Request Form*	
433	*Rabies Test Request Form*	
411	*Bottle Water or Ice Microbiology Request Form*	
428	*Drinking Water Fluoride Request Form*	
425	*Drinking Water Microbiology Request Form*	
427	*Drinking Water Microbiology Monitoring Sample Request Form*	
397	*First Responder/HAZMAT Field Testing For Environmental Samples*	

APPENDIX C
General Rabies Testing Information

Requesting Rabies Testing

Rabies testing questions must be directed toward the closest County Health Department or District Health Office. The MPHL will test specimens ONLY after the requestor has consulted with the appropriate MSDH county clinic or district office staff and obtained testing approval. The MPHL will provide testing at no charge for exposure events associated with public health significance as a public service.

Animals that bite humans

Wild animals
Raccoons, skunks, foxes, and coyotes are the terrestrial animals most often infected with rabies in the United States. All bites by such wildlife must be considered a possible exposure to the rabies virus.. Small rodents like squirrels, hamsters, guinea pigs, gerbils, chipmunks, rats, and mice as well as lagomorphs including rabbits and hares are almost never found to be infected with rabies and have not been known to transmit rabies to humans.

Domestic animals
Healthy dogs, cats and ferrets that bite a person, other pets or livestock should be confined and observed for 10 days instead of euthanized and submitted for testing Such animals should be evaluated by a veterinarian at the first sign of illness during confinement, and if the illness is consistent with rabies or the animal dies, then the animal's head should be removed and shipped on ice packs to the laboratory for rabies testing. Dogs, cats and ferrets that survive the 10-day quarantine period should not be submitted to the laboratory for rabies testing.

Bats
Indigenous rabid bats have been documented in all 49 continental states, including Mississippi. Bats that have interactions with people or domestic animals should be submitted for testing if contact with the bat involved a bite, handling where a bite cannot be ruled out, or bats that are found in a domicile with access to people or domestic animals when they were asleep, unconscious or incapacitated. If one or more bats escape capture, do not submit the remaining bats since recommendations regarding post-exposure prophylaxis will not be altered by testing only some of the bats.

Livestock and horses
Rabies testing should be performed on livestock and horses only if the animal has exposure to a known or suspected rabid animal. An owner of livestock or horse(s) suspected of having exposure to rabies should contact a veterinarian regarding the health of the animal(s) and the recommended tests. The MPHL will accept brain tissues or heads associated with exposed livestock and horses ONLY from the Mississippi Veterinary Research & Diagnostic Laboratory (Phone: 601-420-4700) or the Mississippi State University CVM Diagnostic Laboratory (Phone (662) 325-1104).

Refer to http://www.cdc.gov/rabies/exposure/animals/domestic.html for additional information from the CDC regarding the exposure risks associated with specific animal species.

Rabies Specimen Submission Guidelines

In general, only the following animals will be tested:

1. Wild animals (with the exception of rodents, rabbits or opossums) that bite/expose humans or domestic animals. Raccoons, skunks, foxes, and coyotes are the terrestrial animals most often infected with rabies in the United States.
2. Dogs, cats or ferrets that bite /expose humans and cannot be confined for 10 days of observation or that do not survive the 10-day confinement period.
3. Bats that have interactions with people or domestic animals.

Animals other than bats

Only the head of animals other than bats will be accepted for rabies testing. The MPHL is not equipped for animal disposal or animal necropsy. All heads must be removed by a veterinarian. Attempting to improperly remove an animal head may compromise the integrity of the brain material, rendering the specimen unsatisfactory for testing. MPHL staff MUST be able to identify specific brain anatomy for accurate testing. Intact animals decompose more rapidly than just the animal heads, decreasing our ability to provide accurate results. All animals must be euthanized to avoid damage to the brain. **Contact your local MSDH clinic or district office** to discuss whether the animal should be tested for rabies and to receive instructions on what steps need to be taken next. Before bringing the specimen to your local MSDH site, TRIPLE bag the specimen (animal head only) and make sure each of the three bags are securely closed to prevent leakage. Place the triple-bagged specimen into a hard-sided or Styrofoam box and secure the lid. Keep the specimen cool with ice packs surrounding the bagged specimen. DO NOT FREEZE or have ice directly on the specimen.

Bats

Bats must be submitted whole for rabies testing to allow the lab staff to speciate the bats prior to testing. Because bats are one of the natural reservoirs of the rabies virus, all bats should be treated as if infectious. Never touch a bat with bare hands. If the bat is presumed dead, take caution in case the bat is merely stunned or asleep. Take care to not crush the bat's skull. A damaged brain will render the bat unsatisfactory for testing. If unsure about the condition of the brain, continue with submission and the laboratory staff performing testing will make a final determination on the acceptability of the bat for testing. All efforts should be made to send only deceased bats. Submission of a live bat to the MPHL requires prior approval from the District Office AND the MPHL. In the event that submission of a live bat becomes necessary, packaging and transport of the live bat will need to be addressed. However, the following general guidelines should be followed when submitting live bats:

1. Refer to http://www.cdc.gov/rabies/bats/contact/capture.html for the CDC's guidance on how to capture a live bat. Anyone attempting to handle a live bat must always protect him/herself from potential bites by wearing impenetrable gloves.
2. The live bat should be contained in an **escape-proof** container (e.g. coffee can with tight fitting lid, or Tupperware container)**. Do not** wrap the bat in anything that could hinder access to it (e.g. a cloth towel, packing material, etc.). Be sure to secure the lid COMPLETELY using duct tape if necessary to prevent the bat from escaping; it only takes a tiny opening for a bat to squeeze through and escape.
3. Place the sealed container with the bat in standard leak-proof plastic bag with zipper closure and ensure bag is sealed. If necessary, place the bagged container in a second leak-proof plastic bag with a zipper closure.
4. Contact your local MSDH County clinic or District Office prior to arriving at the health department to receive approval for testing.

Specimen Shipment

All specimens MUST be shipped to the MPHL through a MSDH county clinic or district office. The MSDH has a courier system in place that will deliver the specimens the next day to the MPHL. The MPHL will not accept specimens directly from private citizens or veterinarians; all specimens MUST be screened for exposure risk at the MSDH County or district office. Individuals delivering specimens directly to the MPHL will be referred to their local health department clinic or district office for exposure evaluation.

Rabies Testing Procedure

When the laboratory tests an animal for rabies, technologists examine three areas of the brain: medulla (brain stem), cerebellum, and hippocampus. The laboratory must examine a complete cross section of the brain stem and either the cerebellum or hippocampus to be confident that adequate samples have been tested. If the animal head has been compromised due to trauma or decomposition, the laboratory may not be able to generate a valid result

Turnaround Time and Reporting of Rabies Results

Routine Testing and Result Reporting of Rabies Specimens

- Specimens are tested daily Monday through Friday.

Weekend and Holiday Testing and Result Reporting of Rabies Specimens

- Specimens are not tested on the weekend but do receive priority testing on the following Monday.
- Specimens received after 8:00 a.m. and prior to 3:00 p.m. the day before a holiday will be tested the next working day.
- Emergency weekend or holiday testing will be performed only with approval from the Office of Epidemiology.

Result Interpretation

Positive
Test results indicate that the specimen was positive for rabies virus. The MSDH will assist primary physician with determining if rabies prophylaxis is needed. Further information is available on the CDC website (http://www.cdc.gov/rabies/index.html).

Negative
Test results indicate that the specimen was negative for rabies virus. Post-exposure prophylaxis following exposure to an animal that tested negative for the rabies virus. Further information is CDC website (http://www.cdc.gov/rabies/index.html).

Unsatisfactory
When the laboratory tests an animal for rabies, the technologists examine three areas of the brain: stem, cerebellum, and hippocampus. To be confident that they have an adequate sample for testing, the laboratory must receive a **complete** cross section of the **brain stem** and either the cerebellum or hippocampus. If the required brain parts are not received, they test what was received. If that part is positive, the specimen is reported as positive. However, if the part received is not positive, the specimen is reported as **unsatisfactory**. This is necessary because testing fewer areas of the brain may not lead to detection of a weak positive animal. If you receive an unsatisfactory report, the MSDH Office of Epidemiology will assist the primary physician with determining whether or not rabies prophylaxis is needed.

Inconclusive
An inconclusive report indicates that when the animal was tested for rabies, some material in the brain of the animal looked suspicious but could not be definitively identified as rabies virus. Prior to issuing an inconclusive report, the specimen is retested multiple times. If you receive an inconclusive report for rabies, the MSDH Office of Epidemiology will assist the primary physician with determining whether or not rabies prophylaxis is needed.

Rabies Testing

MSDH Shipment Procedure for Rabies Specimen

Specimens MUST be approved by the District Health Officer or designee prior to submission and in accordance with the Office of Epidemiology Manual. MSDH approved testing will be performed for exposure events deemed to meet public health significance. **Citizens may pay for private rabies testing on request if no human exposure risk is identified or if the exposure does not meet public health significance.**

Specimen Shipment Requirements:

Rabies specimens must be shipped to the MPHL in the designated MSDH rabies shippers. These shippers are grey, thermosafe brand metal chests that are numbered and assigned to specific health department locations. The MSDH clinic or office staff that approved the testing is responsible for ensuring that rabies specimens are properly shipped. The MPHL will reject any specimens submitted in non-MSDH rabies shippers.

Specimen Packaging Requirements:

- Don personal protective equipment.
- Place specimen (animal head or whole bat) in a leak proof plastic bag with a zipper- type closure. Verify that the bag is sealed.
- Place the bagged specimen into second leak proof plastic bag with a zipper-type closure. Verify that the bag is sealed.
- Place double bagged specimen into rabies shipper. Ship only one (1) specimen per shipper.
- Place cold packs between outer (second) specimen bag and shipper. **DO NOT USE LOOSE OR DRY ICE.** Use sufficient cold packs, to maintain a cool environment, even with a delay of one full day.
- Specimens should arrive cold but not frozen. Frozen samples must completely thaw before processing; this can delay testing up to 24 hours.
- Place **completed** Rabies Test Requisition form (Form 433) in the pocket inside the lid of the shipper. **Samples will not be tested until a completed Form 433 is received** . Include form 433 arrives with the specimen.
- Securely close shipper. Make sure shipping label shows Public Health Laboratory.
- Place shipper with other specimens for MSDH courier pick up at the health department.
- Complete the fillable PDF **MPHL Rabies Electronic Submission Notification Document** at http://msdh.ms.gov/msdhsite/_static/resources/6814.pdf. After all information is typed into the document, choose "send by email" to send the form to the MPHL and the Office of Epidemiology. The completion of this notification document is critical for the laboratory to monitor the arrival of rabies specimens and to be able to notify the submitter if a specimen does not arrive as expected. Shipments that fail to arrive at the laboratory require investigation not limited to contact with the submitter and verification of sample disposition with full documentation of these activities. Testing will be delayed for any specimen received without prior notification.

Materials Supplied by the Laboratory (Call 601-576-7582 to request supply restocks.)

1. Rabies shippers (please see picture below): Gray, Thermosafe brand chests. Shippers are to be used to transport animal carcasses and heads for rabies testing only. NO OTHER LABORATORY SAMPLES OR SUBMISSIONS ARE ALLOWED IN THESE SHIPPERS.
2. Disposable packing supplies: Each rabies shipper should contain a disposable lab coat, two Ziploc type bags, and a checklist for packing.
3. Rabies request forms: These forms are supplied using the standard procedure for laboratory requisitions. Ask for form number 433.

Materials Required But Not Supplied by the Laboratory

1. Disposable latex or plastic gloves.
2. Frozen cold packs. These may be obtained commercially or prepared by filling disposable plastic bottles with water and freezing. Every effort will be made by the laboratory to return commercial cold packs to the submitting health department location, but several should be kept on hand for multiple shipments and lost cold packs. Cold packs normally require at least 24 hours to freeze to enable appropriate shipping conditions.
3. Eye protection

APPENDIX D

Guide for the Referral of Potential Agents of Terrorism

The Centers for Disease Control (CDC) has identified certain micro-organisms, toxins, and chemicals as having the potential to be used as agents of terrorism. CDC recognizes hospital laboratories as sentinel labs, and requests that all suspect terrorism samples be referred to the Mississippi Public Health Laboratory (MPHL) for identification, analysis, and/or coordination of shipment of the samples to CDC.

BIOTERRORISM

Potential Bioterrorism Isolates from Clinical Laboratories

Bacterial isolates of suspect bioterrorism agents submitted to MPHL require prior notification. Notification should be made by calling the MPHL Terrorism Response Coordinator or the Division of Special Microbiology at 601-576-7400. **Clinical specimens must be submitted with a completed MSDH Form 1251.**

Shipping instructions for bacterial isolates of suspect bioterrorism agents:

1. The Department of Transportation (DOT) regulates the interstate transportation by surface or air of infectious substances and diagnostic specimens in the United States at www.dot.gov or http://hazmat.dot.gov/ for the latest rules and regulations concerning shipping.
2. Properly packaged isolates may be taken to any county health department for delivery by MSDH contract courier. (See Appendix E for more information on packaging and shipping infectious substances.)
3. If more rapid transportation is warranted, the MS State Department of Health Office of Emergency Planning and Response (OEPR), in partnership with other state and local agencies will arrange transportation of samples.
4. The MSDH "List of Reportable Diseases and Conditions" requires immediate notification to the Office of Epidemiology when the following agents are suspected: *Bacillus anthracis, Yersinia pestis, Francisella tularensis, Brucella* species, *Burkholderia pseudomallei, Burkholderia mallei, Coxiella burnetti, Variola major* (smallpox), botulinum toxin, ricin, and staphylococcus enterotoxin:

Smallpox Patient Specimens
Call the Mississippi Public Health Lab and the Office of Epidemiology at 601-576-7400 before collecting and shipping any potential smallpox specimen.

LOW to MODERATE RISK OF SMALLPOX - If the febrile rash illness is classified as low to moderate risk according to CDC guidelines, request a Varicella PCR assay to be performed to rule out chickenpox. Shipping instructions for patient specimens with low to moderate risk of smallpox: Package and label according to DOT and IATA guidelines. The package may be taken to any county health department for courier transport to the Mississippi Public Health Lab.
HIGH RISK OF SMALLPOX – If the febrile rash illness is classified as high risk of smallpox according to CDC guidelines, **immediately report to MSDH Office of Epidemiology and the Mississippi Public Health Lab 601-576-7400**. If smallpox is still suspected after MSDH review, the case will be reported to CDC.
Shipping instructions for patient specimens with high risk of smallpox:
CDC must provide approval before a potential smallpox patient clinical specimen is shipped to CDC's BSL4 lab in Atlanta. Once CDC has given approval for shipment, package and label the sample as an Infectious Substance, Category A according to DOT and IATA guidelines. **Specimens from patients with a high risk of smallpox should not be shipped to the Mississippi Public Health Lab.**

Environmental Samples (Powders)
Hospital laboratories should not process environmental (non-clinical) samples received from a possible bioterrorism event, especially powders. Individuals who possess environmental samples associated with a terrorism event should contact their local law enforcement agency.

Sample Collection Guidelines for First Responders
Bioterrorism samples should be collected and submitted to the MPHL as described below to ensure that the samples are submitted in a manner that promotes safety for all agency staff and preserves legal chain of custody.

Field Testing Requirements

1. MSDH Form 397, Field Testing for First Responders, will be completed to document all field testing performed on samples being submitted for bioterrorism testing. The form can be downloaded as a PDF at: http://msdh.ms.gov/msdhsite/_static/resources/2049.pdf
2. 2**.** Samples should be field tested for the following**:** radiological agent, explosive agent, chemical agent, biological agent, or nerve agent.
3. The equipment used, type of testing conducted, and the result of testing should be documented on MSDH Form 397.
4. **Laboratory staff will not accept environmental terrorism suspect samples into the laboratory building without a completed MSDH Form 397.**

Environmental Sample Packaging Requirements

1. Unopened packages or letters are not accepted by the Mississippi Public Health Laboratory for bioterrorism testing. Letters and packages must be opened by local qualified emergency response assets or Office of Emergency Planning and Response (OEPR) Alpha Level Responders before they will be accepted.
2. Samples will not be accepted from the general public**. Samples will only be accepted when delivered by MSDH OEPR staff, pre-designated MSDH staff, FBI agents, Postal Service Inspectors, Civil Support Team (CST) members or other official law enforcement or governmental agency representative.**
3. Sample packaging dimensions must be less than 12" on all sides. **Packages larger than the specified dimensions will not be accepted for testing.**
4. Sample packaging must meet the below standards minimally:
   - Double bagged in zip lock type bags inside a sturdy outer container.
   - The outer container will be leak proof and able to maintain integrity if dropped while in transit.
   - The outside of the package will be thoroughly decontaminated to assure safe handling.

Sample Delivery Requirements

1. The laboratory bioterrorism team will be alerted at least 60 minutes prior to expected delivery.
2. The specific sample delivery location will be given prior to sample delivery.
3. BEFORE allowing any samples into the building, the laboratory staff will examine MSDH Form 397 and the submitting law enforcement agency's chain of custody documentation for completeness. The MPHL will keep a copy of the submitting agency's chain of custody documents and return the original to the submitter.
4. The laboratory staff will also examine the size and packaging of the sample BEFORE allowing it into the building.

CHEMICAL TERRORISM

Clinical Samples

LRN sentinel labs should call the MPHL Terrorism Response Coordinator at 601-576-7400 prior to submitting samples from a potential chemical exposure. Sample integrity using chain of custody documentation must be maintained during collection, storage, and shipment of these specimens.

The CDC lists sixty-four chemicals that are potential warfare agents. Clinical samples (blood and urine) from patients possibly exposed to such chemicals should be shipped to the MPHL for analysis. The PHL can detect exposure to a number of toxic chemical agents, including cyanide, nerve agents and toxic metals.

Visit http://msdh.ms.gov/msdhsite/_static/14,0,188,614.html#Terrorism for MPHL specimen collection guidelines.

All IATA and DOT shipping guidelines should be followed when submitting suspect chemical terrorism samples to the MPHL. Please see Appendix E for additional shipping information.

If the Office of Epidemiology decides the situation warrants rapid transportation, the Office of Emergency Response, in partnership with other state and local agencies, will arrange transportation of clinical samples associated with a suspected terrorist threat. The samples should be routed to the Mississippi Public Health Laboratory as quickly as possible. Delivery of these samples should be coordinated with the MPHL **Terrorism Response** Coordinator, 601-576-7400.
If the exposure risk warrants overnight shipment using an express courier please ship the samples to:

Terrorism Response Coordinator
1-601-826-5480
Mississippi Department of Health
Public Health Laboratory
570 East Woodrow Wilson
Jackson, MS 39216

APPENDIX E

GUIDELINES FOR CLINICAL SERVICES SPECIMEN SHIPPING

The MPHL accepts specimens for clinical services from health department and non-health department submitters. Submitters include clinics operated by the MS State Department of Health, private hospitals, reference laboratories, physician's offices, correctional facilities and law enforcement officials. Submitters ship specimens to the MPHL through the following three transportation systems: a contracted MSDH courier service, private hospital and reference laboratory courier services, and private commercial delivery services.
The Department of Transportation regulates the transportation of infectious substances, including specimens and cultures by surface and air in the United States. See http://www.phmsa.dot.gov/ or http://www.phmsa.dot.gov/ for the latest rules and regulations concerning shipping. (Using the search function with "infectious substance" as the keyword will generally locate the *Transporting Infectious Substances Safely* brochure.) The print version is also available from DOT free of charge. (Phone: (202) 366-2301; Fax: (202) 366-7342; Email: training@dot.gov.

MSDH Contract Courier System

All submitters may ship specimens to the MPHL through the contracted MSDH courier system.
Within the MSDH courier system, the health department clinics function as a submitter for health department patient samples and as a site for non-health department submitters located in the geographical areas to drop-off pre-packaged samples for transportation to the MPHL at no charge. The health department clinics are not responsible for the packaging of non-health department samples. Non-health department submitters should verify that all specimens are packaged as required by all Department of Transportation (DOT) regulations prior to delivery to the health department clinics.

Private Hospital and Reference Laboratory Courier Service

Private hospitals and reference laboratories may utilize their own courier service for sample delivery. Samples should be packaged, marked, labeled and transported according to DOT regulations. The MSDH is not responsible for the operations of any private courier service. Refer to Appendix Q for local delivery instructions.

Commercial Delivery Services

Submitters may ship pre-approved specimens to the MPHL through commercial delivery services. Submitters are responsible for complying with all shipping regulations. The submitter should contact the commercial carrier for shipping requirement questions. Some commercial carriers require compliance with International Air Transport Association (IATA) regulations which are published in the IATA Dangerous Goods Regulations, whether the package is being shipped by air or by ground (http://www.iata.org/).

Submitter Shipping Responsibility

Regardless of the shipping system utilized, the submitter is responsible for shipping specimens in conformance with all safety and labeling regulations, including the proper classification of specimens and cultures for transport. Failure to ship specimens as required by shipping regulations may evoke severe penalties against the shipper. Review each test section provided in this guide for additional test-specific shipping instructions. Specimens and Cultures Shipped through the MSDH Courier System are shipped by ground transport and are regulated by the Department of Transportation (DOT).

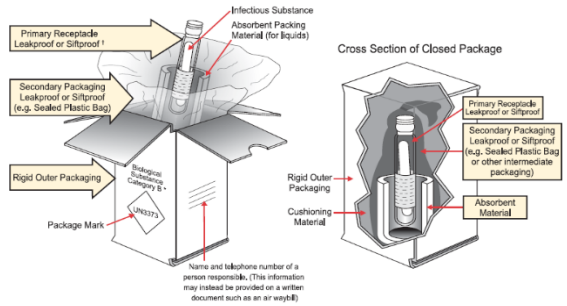
Class 6, Division 6.2 Infectious Substances

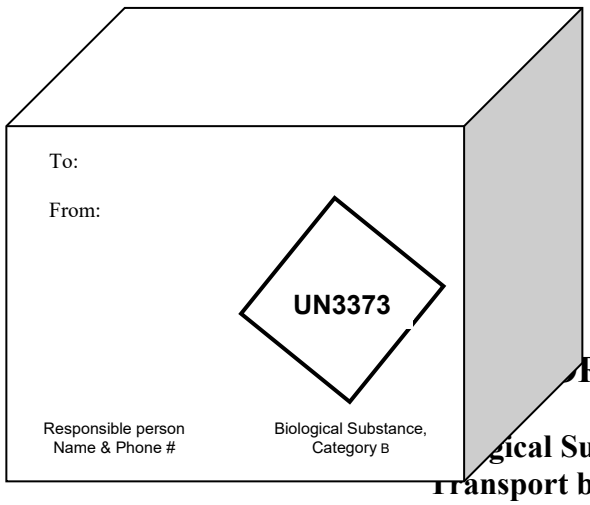
1. **Category A:** (49 CFR 173.134) "An infectious substance in a form capable of causing permanent disability or life-threatening or fatal disease in otherwise healthy humans or animals when exposure to it

occurs. An exposure occurs when an infectious substance is released outside of its protective packaging, resulting in physical contact with humans or animals. Classification must be based on the known medical history or symptoms of the source patient or animal, endemic local conditions, or professional judgment concerning the individual circumstances of the source human or animal. Category A poses a higher degree of risk than Category B." The proper shipping name and identification number for Category A infectious substances is Infectious substances, affecting humans, UN2814. A shipper's declaration is required for all Category A packages.
Shipping Instructions: Category A infectious substances may be brought to the county health departments for transport to the Public Health Lab by the MSDH contract courier service. Samples must be packaged, marked, and labeled by trained, certified persons according to 49 CFR parts 173.196 before being transported by State Contract Courier.

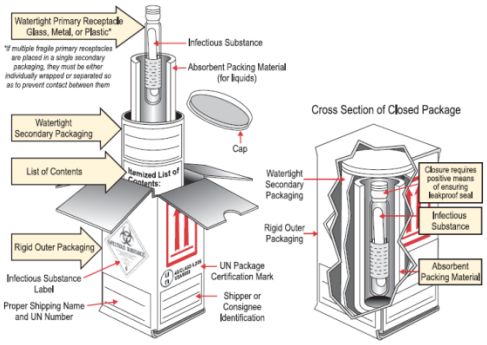
2. **Category B:** (49 CFR 173.134) "An infectious substance not in the form generally capable of causing permanent disability or life-threatening or fatal disease in otherwise healthy humans or animals when exposure to it occurs. This includes Category B infectious substances transported for diagnostic or investigational purposes." The proper shipping name and identification number are Biological Substance, Category B, UN3373.
Shipping Instructions: Category B infectious substances (specimens and cultures not meeting the criteria of Category A) may be brought to the county health departments for transport to the Public Health Lab by the MSDH Contract Courier Service. Samples must be properly packaged in accordance with DOT regulations 49 CFR part 173.199 prior to delivery to a local Health Department.
3. **Frozen Specimens** – Since primary and secondary packaging containers must be air-tight, always place dry ice outside of secondary packaging. Dry ice should never be placed inside any other air-tight container. Anytime dry ice is used, the miscellaneous hazard label and the net quantity in Kg of the dry ice should be on the outside of the package.

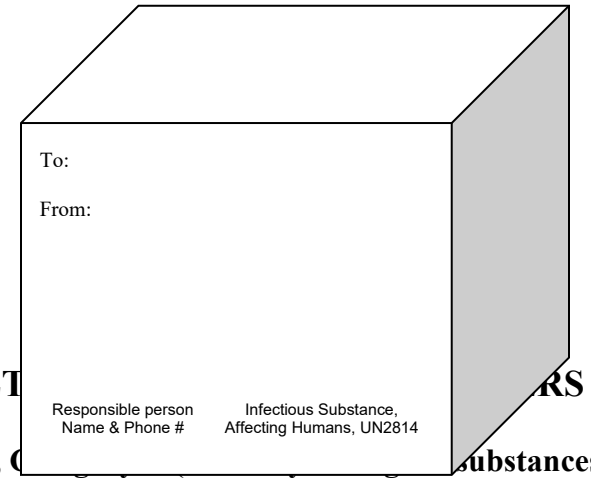
Category B
Infectious Substance





Category A
Infectious Substance





R HEALT RS

gical Substances, C ubstances) for
Transport by the Contract Courier Service

1. Specimen containers must be leak-proof for liquid specimens and sift-proof for solid specimens. Screw caps may be secured with Parafilm®. The maximum quantity for an individual specimen container is 500 mL or 500 g.

2. Place each specimen container, i.e. blood tube, in a zip-lock biohazard bag. **One specimen per bag!**

3. If the specimen is liquid, place adequate absorbent material inside the bag to absorb all of the contents in the event of a spill. (Most biohazard bags provided by the MSDH Public Health Laboratory contain a sheet of absorbent that is sufficient to absorb at least 50 mL.)

4. **Zip** the bag so that the zip lock bag is a leak-proof secondary container.

5. Place the test requisition facing outward in the pocket of the bag.

6. Place all zip lock bags in a rigid transport box, meeting minimum testing requirements**. (**Each complete outer package must be capable of successfully passing a drop test of not less than 1.2 m (3.9 feet) and must be at least 100 mm (4 in) in the smallest overall external dimension.)

8. Specimens must be secured in the transport box with suitable cushioning material.

9. Secure the lid of the transport box.

10. If not using rigid shipping totes supplied by the laboratory, the shipment should be packed, marked, and labeled according to DOT regulations for Class 6, Division 6.2 Infectious Substances. Refer to 49 CFR 173.134.

11. Each person who packages a clinical specimen for transport must be familiar with the DOT regulations for the transport of biological substances. Certification of shipping training is not required for specimens classified as Biological Substances, Category B.

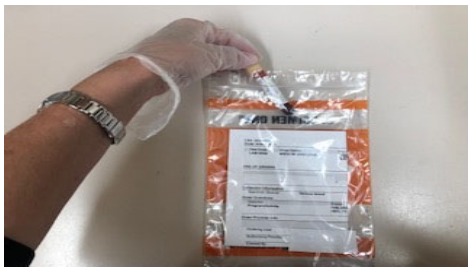
12. Clinical specimens from private submitters delivered to the health department for transport to the MPHL should be placed in the laboratory shipping tote by health department staff.

MSDH QUICK REFERENCE FOR CLINICAL SPECIMEN PACKAGING

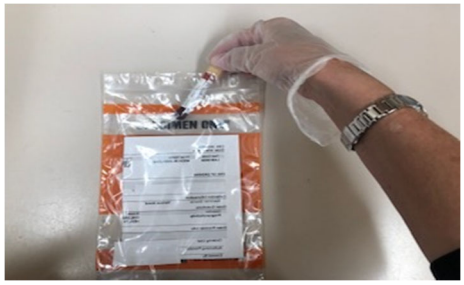
1. Assemble a new biohazard bag, a completed laboratory request slip from Epic (if needed) and the specimen. Don appropriate personal protective equipment. Always observe Universal Precautions when handling human specimens.

2. Compare patient information on the specimen with the information on the request slip (if needed). They must match exactly. If possible, get a coworker to check behind you.

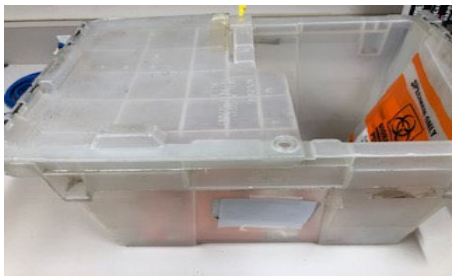
3. If included, fold request slip with the patient information facing out and insert into the side, not zippered, pocket of the biohazard bag with patient information facing OUT.



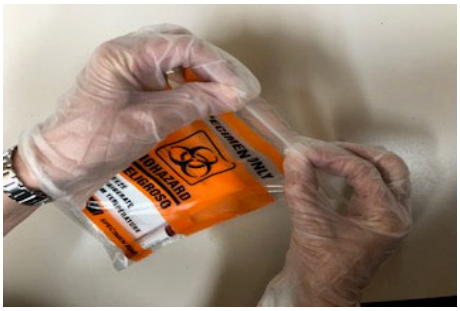
4. Place the specimen into the zippered pocket of biohazard bag. Make certain the specimen and the request slip (if included) match



5. Seal zippered pocket of the biohazard bag. Double check to assure seal is leak proof.



6. For test with multiple samples, rubber band together by test. Place in approved rigid laboratory shipping tote.



APPENDIX F

APTIMA ® COMBO 2 ASSAY COLLECTION PROCEDURE FOR GC, CT and TV

A. Test Purpose

APTIMA ® Combo 2 Assay is a nucleic acid amplification test (NAAT) that detects and differentiate infection by *Chlamydia trachomatis (CT)* and/or *Neisseria gonorrhoeae (GC)* in vaginal swab specimens and in female and male urine specimens. The assay also can detect *Trichomonas vaginalis (TV)* in female and male urine specimens. The assay may be used to test specimens from symptomatic and asymptomatic individuals. Different collection and transport kits may be required for different collection sites.

Test Disclaimers:
Medico-legal specimens are not to be collected using this technology (NAAT) as they are not admissible in court.

B. Urine Specimen Collection (CT/GC and TV)

- Materials Required:

  Aptima Urine Specimen Collection Kit for Male and Female Urine Specimens

  - Specimen Collection:
    The client should not have urinated for at least 1 hour prior to specimen collection. Female patients should not cleanse the labial area prior to providing the specimen. Instruct patient to provide a first-catch urine (approximately 20 mL to 30 mL or the initial urine stream) into a urine collection cup. **Collection of larger volumes of urine may result in specimen dilution that may reduce test sensitivity.**

  - Packaging, Transporting, and Storage of Urine Specimens
    After collection, urine samples must be transferred to the urine specimen transport tube immediately and placed inside of a biohazard bag with the completed Form 984. Remove the cap from the urine transport tube and transfer 2 mL of urine into tube using a disposable pipette. The correct volume of urine has been added when the fluid level is between the black fill lines on the urine specimen transporter tube label. Re-cap the urine specimen transport tube tightly and place a label with the client identification information. All urine samples MUST be transported to the laboratory in the GEN-PROBE APTIMA® URINE transport tube. Transport and store the GEN-PROBE APTIMA® URINE transport tube with the urine specimen at 2° to 30°C until tested.

C. Vaginal Swab Specimen Collection (CT/GC only)

Note: For patient-collected vaginal swab specimen collection, ensure that patients read the Patient Collection Instructions before providing them with a collection kit.

- Materials Required
  Aptima® Multitest Swab Specimen Collection Kit

  - Wash hands before beginning the collection of vaginal swab.
  - Partially peel open the swab package. Remove the swab. Do not touch the soft tip or lay the swab down. If the soft tip is touched, the swab is laid down, or the swab is dropped, use a new Aptima Multitest Swab Specimen Collection Kit. 2.

- Hold the swab, placing your thumb and forefinger in the middle of the swab shaft covering the score line. Do not hold the swab shaft below the score line.
- Carefully insert the swab into the vagina about 2 inches (5 cm) past the introitus and gently rotate the swab for 10 to 30 seconds. Make sure the swab touches the walls of the vagina so that moisture is absorbed by the swab and then withdraw the swab without touching the skin.
- While holding the swab in the same hand, unscrew the cap from the tube. Do not spill the contents of the tube. If the contents of the tube are spilled, use a new Aptima Multitest Swab Specimen Collection Kit.
- Immediately place the swab into the transport tube so that the score line is at the top of the tube. 6. Carefully break the swab shaft at the score line against the side of the tube.
- Immediately discard the top portion of the swab shaft.
- Tightly screw the cap onto the tube.
- Wash hands after completion of the swab collection.
- Provide the closed container to the nurse.
-

D. Pharyngeal Swab Collection (CT/GC only)

Note: For patient-collected throat swab specimen collection, ensure that patients read the Patient Collection Instructions before providing them with a collection kit.

- Materials Required
  Aptima® Multitest Swab Specimen Collection Kit

- Wash hands before beginning the collection of pharyngeal swab.
- Partially peel open the swab package. Remove the swab. Do not touch the soft tip or lay the swab down. If the soft tip is touched, the swab is laid down, or the swab is dropped, use a new Aptima Multitest Swab Specimen Collection Kit.
- Hold the swab, placing your thumb and forefinger in the middle of the swab shaft covering the score line. Do not hold the swab shaft below the score line.
- Carefully insert the swab into the throat ensuring contact with bilateral tonsils (if present) and the posterior pharyngeal wall, then withdraw the swab without touching the inside of the cheeks or tongue.
- While holding the swab in the same hand, unscrew the cap from the tube. Do not spill the contents of the tube. If the contents of the tube are spilled, use a new Aptima Multitest Swab Specimen Collection Kit.
- Immediately place the swab into the transport tube so that the score line is at the top of the tube.
- Carefully break the swab shaft at the score line against the side of the tube.
- Immediately discard the top portion of the swab shaft.
- Tightly screw the cap onto the tube.

E. Rectal Swab Specimens Collection and Handling (CT/GC only)

Note: For patient-collected rectal swab specimen collection, ensure that patients read the Patient Collection Instructions before providing them with a collection kit.

- Materials Required
  Aptima® Multitest Swab Specimen Collection Kit

- Wash hands before beginning the collection of rectal swab.
- Partially peel open the swab package. Remove the swab. Do not touch the soft tip or lay the swab down. If the soft tip is touched, the swab is laid down, or the swab is dropped, use a new Aptima Multitest Swab Specimen Collection Kit.
- Hold the swab, placing your thumb and forefinger in the middle of the swab shaft covering the score line. Do not hold the swab shaft below the score line.

- Carefully insert the swab into the rectum about 1-2 inches (3-5 cm) past the anal margin and gently rotate the swab for 5 to 10 seconds. Withdraw the swab without touching the skin.
- While holding the swab in the same hand, unscrew the cap from the tube. Do not spill the contents of the tube. If the contents of the tube are spilled, use a new Aptima Multitest Swab Specimen Collection Kit.
- Immediately place the swab into the transport tube so that the score line is at the top of the tube.
- Carefully break the swab shaft at the score line against the side of the tube.
- Immediately discard the top portion of the swab shaft.
- Tightly screw the cap onto the tube.
- Wash hands after completion of the swab collection.

Appendix G

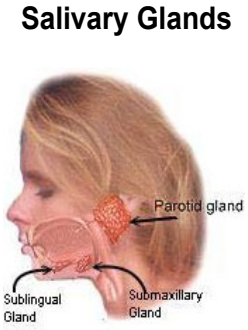
Mumps Virus PCR Specimen Collection Procedure

Notify the Office of Epidemiology prior to shipping Mumps PCR samples

Preferred specimen: The preferred specimen is a buccal swab collected in viral transport medium within 9 days of onset of symptoms. **Collect the Mumps buccal sample using the viral transport flu kit that is provided for the collection of Influenza specimens for testing by PCR.**

Collection Procedure:

1. Buccal swab specimen should be collected only with a Dacron® or other synthetic tip and a wire shaft. **Swabs with calcium alginate or cotton tips and wooden shafts are unacceptable.**
2. Collect buccal fluid by swabbing the buccal cavity (the space between the cheek and teeth). The parotid duct drains in this space near the upper molars. Massage the parotid gland area just in front of the ear and near the angle of the jaw for 30 seconds prior to collecting secretions on the swab. Swab the area between the cheek and gum by sweeping the swab near the upper molar to the lower molar area.



Specimen Preparation:

1. Place swab into a test tube containing viral transport medium. The red top tube in the flu kit contains viral transport medium.
2. Label transport medium tube with the patient's name and date of birth.
3. Enclose a **completed** MSDH Form 402 in outside flap of biohazard bag.
4. Refrigerate (do not freeze) the specimen until it can be shipped.

Specimen Shipping:

1. Ship specimen with an **ice pack** in a RIGID outer container (Styrofoam box or cooler). DO NOT SHIP SPECIMENS IN AN ENVELOPE.

Appendix H

Bordetella species PCR Specimen Collection Procedure

Notify the Office of Epidemiology prior to shipping Bordetella PCR samples

Testing should be performed only on patients likely to have *B. pertussis* and as soon as possible after symptoms compatible with *B. pertussis* are exhibited by the patient. PCR positive rates will decrease over the two week period following onset of symptoms. Therefore, sample collection is recommended for the following situations:

1. Patients who have symptoms compatible with pertussis (paroxysmal cough, whoop, apnea, and/or post-tussive vomiting) within two weeks and as soon as possible after onset of illness.

OR

2. Any patient with an acute cough (any duration) **and** exposure to a case.

Pertussis testing is not recommended for:

3. Asymptomatic persons who have had contact with a pertussis case.

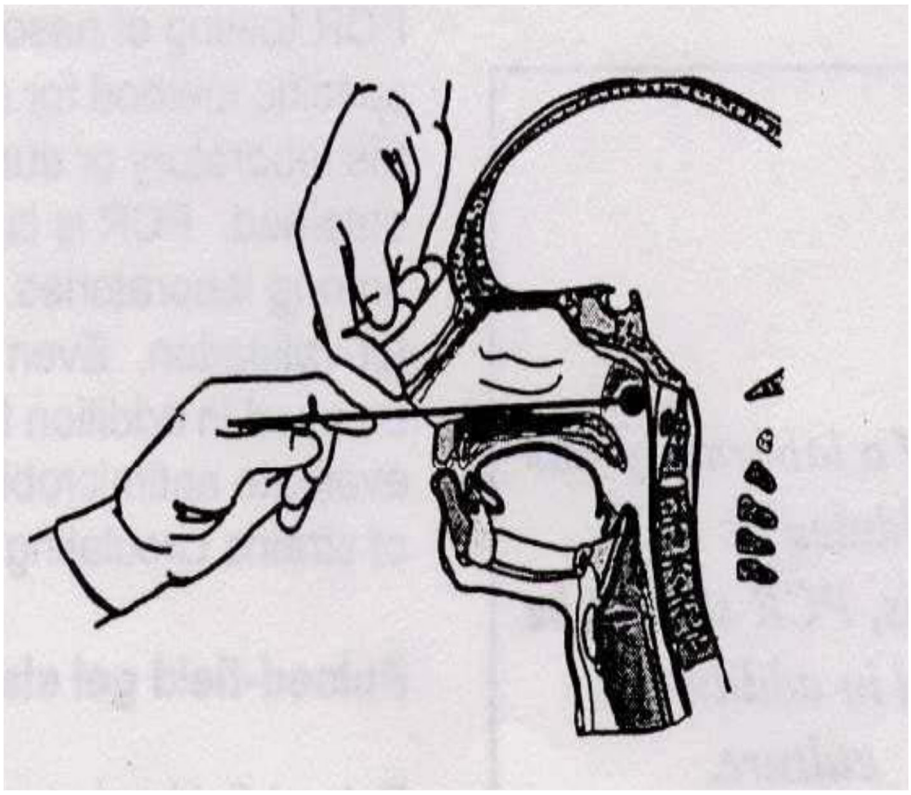
4. Patients with cold-like symptoms (sore throat, runny nose, sneezing, etc.) **without** a cough.

Specimen Collection Procedure

*For best results, collect specimens prior to beginning antibiotic regiment.

Nasopharyngeal Swab (Preferred Specimen)

1. Collect only one nasopharyngeal Dacron® or polyester tipped swab for each patient.
   Note: Swabs with calcium alginate or cotton tips and wooden shafts are NOT acceptable for PCR testing.
2. Immobilize the patient's head and gently pass the swab through the nostril into the nasopharyngeal cavity to the point of resistance; gently rotate. Do not direct the swab upward but allow the swab to glide along the floor of the nasal cavity. Do not force the swab past obstruction. **See the diagram below.**
   - Leave swab in place for 10-30 seconds.
   - Slowly remove with a circular motion.
3. Place swab into the provided 15 mL sterile conical tube or other sterile container with screw cap lid. **The swab SHOULD NOT be placed into any transport media**. Specimen should be immediately refrigerated (2-8°C) after collection and shipped on cold packs within 24 hours.
4. Label conical tube with patient's name and date of collection.
5. Each specimen must be accompanied by a completed MSDH test requisition Form 402 or 1252.
6. Place a completed form in the OUTER pouch of the plastic biohazard bag containing an individual specimen. Do not place any paperwork in the inner pouch with the tube.
7. Ship specimen with an **ice pack** in a RIGID outer container (Styrofoam box or cooler).
   DO NOT SHIP SPECIMENS IN AN ENVELOPE



Nasal Wash

1. Instill several milliliters of sterile saline into nostrils while patient's head it tilted backward.
2. Bring patient's head forward and catch saline from nostrils into a sterile container.
3. Pour at least 0.5 mL of specimen into a sterile, media-free urine cup/ tube.
4. Label urine cup/tube with patient's name and date of collection.

Specimen Shipping

1. Each specimen must be accompanied by a completed MSDH test requisition Form 402 or 1252.
2. Place a completed form in the OUTER pouch of the plastic biohazard bag containing an individual specimen. Do not place any paperwork in the inner pouch with the tube.
3. Ship specimen with an **ice pack** in a RIGID outer container (Styrofoam box or cooler). DO NOT SHIP SPECIMENS IN AN ENVELOPE.

Appendix I

Respiratory Virus Specimen Collection Procedure

Use only synthetic fiber swabs with thin plastic or wire shafts. Do not use calcium alginate swabs or swabs with wooden shafts, as they may contain substances that inactivate some viruses and may inhibit molecular tests.

A. Nasopharyngeal Swab Collection (*Collect for both Influenza/SARS-CoV-2 or SARS-CoV-2 only RT-PCR and Respiratory Virus Panel Testing***)**

1. Prior to collection of the specimen, don the appropriate personal protective equipment.
2. Tilt patient's head back 70 degrees.
3. Gently and slowly insert a minitip swab with a flexible shaft (wire or plastic) through the nostril parallel to the palate (not upwards) until resistance is encountered or the distance is equivalent to that from the ear to the nostril of the patient, indicating contact with the nasopharynx.
4. Gently rub and roll the swab.
5. Leave swab in place for several seconds to absorb secretions.
6. Slowly remove swab while rotating it. Specimens can be collected from both sides using the same swab, but it is not necessary to collect specimens from both sides if the minitip is saturated with fluid from the first collection.
7. If a deviated septum or blockage create difficulty in obtaining the specimen from one nostril, use the same swab to obtain the specimen from the other nostril.
8. Place swab, tip first, into the transport tube provided. Label the tube with the patient's name, specimen source, and date/time of collection.
9. Place specimen in a biohazard bag and store at 2-8°C until shipment.

B. **Nasal mid-turbinate (NMT) specimen (***Collect for only Influenza/SARS-CoV-2 or SARS-COV-2 RT-PCR)*

1. Prior to collection of the specimen, don the appropriate personal protective equipment.
2. Use a tapered swab.Tilt patient's head back 70 degrees.
3. While gently rotating the swab, insert swab less than one inch (about 2 cm) into nostril parallel to the palate (not upwards) until resistance is met at turbinates.
4. Rotate the swab several times against nasal wall and repeat in other nostril using the same swab.
5. Place swab, tip first, into the transport tube provided. Label the tube with the patient's name, specimen source, and date/time of collection.
6. Place specimen in a biohazard bag and store at 2-8°C until shipment.

C. Anterior nasal specimen (*Collect for only Influenza/SARS-CoV-2 or SARS-CoV-2 RT-PCR)*

1. Insert the entire collection tip of the swab provided (usually ½ to ¾ of an inch, or 1 to 1.5 cm) inside the nostril.
2. Firmly sample the nasal wall by rotating the swab in a circular path against the nasal wall at least 4 times.
3. Take approximately 15 seconds to collect the specimen. Be sure to collect any nasal drainage that may be present on the swab.
4. Repeat in the other nostril using the same swab.
5. Place swab, tip first, into the transport tube provided. Label the tube with the patient's name, specimen source, and date/time of collection.
6. Place specimen in a biohazard bag and store at 2-8°C until shipment.

D. Transport

1. Ship specimen with an **ice pack** in a RIGID outer container (Styrofoam box or cooler). DO NOT SHIP SPECIMENS IN AN ENVELOPE.
2. Each specimen must be accompanied by the appropriate test requisition. Place a completed form in the OUTER pouch of the plastic biohazard bag containing an individual specimen.
3. On the day of collection, transport the specimen to the local health department for courier pick up.

Appendix J

Capillary Blood Collection Procedure for Blood Lead Testing

Supplies Needed:

Lead-Free Microtainers, Lancets, Alcohol swabs, Sterile- gauze pads, Gloves

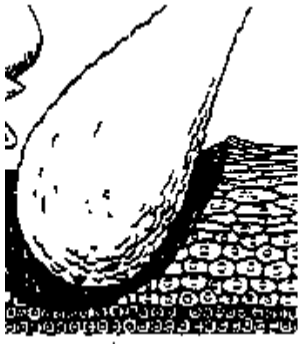
Specimen Collection Procedure

1. Lay out all of the supplies needed for a single collection.
2. Don a pair of disposable gloves that fit appropriately.
3. Seat the ambulatory patient in a standard phlebotomy chair with an arm board.
    a. For at-home visits, pediatric patients should sit in the lap of an adult and older children may sit in a chair with the arm extended over a table. The patient's arm should be held as if he or she were seated at a miniature phlebotomy chair with an arm board. This position improves and optimizes the blood pressure in the fingertip and venous perfusion. Positions with the arm very much higher or lower than described tend to reduce or even stop the pressure at the fingertip and blood flow will be affected. When possible, the torso of supine (lying down with face upward) patients should be raised slightly and /or the arm lowered to a position slightly below the level of the breastbone.
4. Gently massage the entire length of the finger to increase the temperature and improve perfusion.
5. Clean the incision site and surrounding area with 70% isopropyl alcohol. Thoroughly dry the site with the sterile gauze pad to prevent rapid hemolysis caused by residual alcohol.
6. Again, gently massage the lower portion of the finger while avoiding the fingertip incision site. Firmly grasp the lower portion of the finger to restrict return circulation. Firmly position the lancet device at the incision site (refer to site selection instructions above) and depress the trigger.
7. After triggering, immediately remove the device from the patient's finger. Using a sterile gauze pad, gently wipe away the first drop of blood. Apply gentle, continuous pressure to the finger avoiding excessive massaging as this may contaminate the sample or cause hemolysis.
8. After massaging the finger and forming a good drop of blood, touch the collector end of the container to the drop of blood. After collecting 2 or 3 drops, the blood will flow freely down the container wall to the bottom of the tube. Avoid excessive squeezing "milking" scooping or scraping. Fill as close to the 250 µL line as possible (200 µL minimum).
9. Replace cap on the microtainer. Gently invert to mix the blood well with the anticoagulant.
10. Following blood collection, gently press a dry sterile gauze pad to the incision site until bleeding stops. If indicated, apply a bandage to the finger.

Appendix K

Varicella-Zoster Virus PCR Collection Procedure*

Swab Specimen Collection



1. Unroof a vesicle using a sterile 26 gauge needle.
2. Using a sterile Dacron® or synthetic-tipped swabs with a plastic shaft, scrub the base of the lesion vigorously enough to ensure that cells from the lesion are collected. Blood contamination is acceptable.
3. Place the swab into a 15 mL conical tube or a urine cup. Break or bend the swab shaft as necessary. DO NOT place specimen in transport medium.
4. Label the tube with the patient's name and date/time of collection.
5. Place the specimen in a biohazard bag and enclose a **completed** MSDH Form 402 in outside flap of biohazard bag.

Scab Specimen Collection

1. If lesions have crusted over, lift the scab from the skin using the beveled point of a 26-gauge needle.
2. Transfer the scab to a sterile urine cup or suitable container. DO NOT place the specimen in transport medium.
3. Label the tube with the patient's name and date/time of collection.
4. Place the specimen in a biohazard bag and enclose a **completed** MSDH Form 402 or 1252 in outside flap of biohazard bag.

Specimen Transport

1. Specimens should be shipped to the laboratory at **room temperature** and **dry**.
2. Do not ship specimens on ice or place in transport media.

Appendix L

Vaccinia (Non-variola Orthopox) PCR Collection Procedure

Swab and Scab Specimen Collection

1. Sanitize skin with alcohol wipe and allow to completely dry.
2. Open and remove the top of the lesion using a sterile scalpel or 26-gauge needle.
3. Place the vesicle or pustule skin "roof" in a dry, sterile 1.5-2 mL screw-capped plastic vial with O-ring.
4. Cap vial to maintain relative sterility, and keep vial in as cool an environment as reasonably possible to preserve virus viability.
5. Using a sterile Dacron® or synthetic-tipped swabs with a plastic shaft, scrub the base of the lesion vigorously enough to ensure that cells from the lesion are collected. Blood contamination is acceptable.
6. Place the swab into a 15 mL conical tube or a urine cup. Break or bend the swab shaft as necessary. DO NOT place specimen in transport medium.
7. Label the tube with the patient's name and date/time of collection.
8. Place the specimens in a biohazard bag and enclose a **completed** MSDH Form 402 or 1252 in outside flap of biohazard bag.

Punch biopsy of lesion (if possible, obtain at least 2 separate lesions)

1. Use a 3.5- or 4-mm punch biopsy device to sample an entire lesion.
2. Bisect the biopsied material, using sterile scissors or scalpel.
3. Place half the biopsied material in formalin for histopathologic and immunohistochemical evaluation and keep at room temperature or above freezing (e.g., 2-8°C).
4. Place the other half of the biopsied material dry (do not add transport medium) in a sterile (1.5-2 mL) screw-capped plastic vial with O-ring.
5. Repeat procedure with at least one more lesion.

Specimen Transport

1. Specimen should be shipped to the laboratory on ice packs within 24 hours of collection.

Appendix M

QuantiFeron® Gold Plus (TB EIA) Collection Procédure

Do not collect specimens on Friday unless correct incubation times can be assured.
Please call the Clinical Chemistry Lab at 601-576-7582 with any additional questions

Required Collection Tubes Per Patient:
Nil Antigen tube (Grey cap), TB1 Antigen Tube (Green cap), TB2 Antigen (Yellow cap), Mitogen Tube (Purple cap)

1. **Blood Collection**
   a. Using standard venipuncture technique, draw 1 mL (0.8–1.2 mL of blood into each of the collection tubes (the black fill line on the side of the tube indicates the 1 mL fill mark).
   Note: Tube will fill slowly. Under or over-filling of the tubes outside of the 0.8 to 1.2mL range may lead to erroneous results.
      1. If a butterfly needle is being used to collect blood, a "purge" tube should be used to ensure that the tubing is filled with blood prior to specimen collection.
   b Immediately after filling tubes, shake them 10 times just firmly enough to ensure the entire inner surface of the tube is coated with blood, to dissolve antigens on tube walls.
   b. Label each tube appropriately. Ensure each tube (Nil, TB1 Antigen, TB2 Antigen and Mitogen) is identifiable by its label once cap is removed.
   c. Complete the test requisition form.
   d. Maintain tubes at room temperature (22°C ± 5°C). Do not refrigerate or freeze the blood samples.
2. **Incubation of Blood in Clinic**
   a. If the blood is not incubated immediately after collection, re-mix the samples by vigorously shaking the tubes for 5 seconds immediately prior to incubation.
   b. Within 16 hours of collection, incubate the tubes UPRIGHT at 37ºC ±1°C for 16 to 24 hours.
   c. Following the 37ºC ± 1ºC incubation, blood collection tubes should be received in the laboratory within 72 hours..
      1. Do not over incubate
      2. Remove blood tubes from incubator after 16 to 24 hours and package for shipping.
      3. Maintain tubes between 4°C and 27°C.
      4. Do not centrifuge specimens before shipment.
3. **Packaging and Shipping**
   a. Place all four tubes into one biohazard bag.
   b. Place the completed lab request slip into the outside section of the biohazard bag.
   c. Tubes do not have to be kept upright after incubation.
   d. Do not ship on ice.
   e. Specimens should be shipped to the laboratory through the MSDH courier system using the approved plastic shipping tote provided by the lab.
4. **Test Results**
   a. Results will be sent to the county within 3 to 5 days.
   b. If results are not received within one week, call the District TB Coordinator for assistance.

Appendix N

Measles Specimen Collection

Specimen Collection

RT-PCR Testing
Collect both a respiratory swab AND a urine for each patient. The CDC recommends that a nasopharyngeal/throat swab and a blood specimen be collected from all patients with clinical features compatible with measles. Urine specimens may also contain virus and, when feasible to do so, collection of both respiratory and urine specimens can increase the likelihood of detecting virus.

1. **Throat or nasopharyngeal swab** A throat swab is the preferred specimen:

    a. Collect swab as soon as possible after rash onset. Most successful when specimens are collected within 3 days of rash onset and a maximum of 14 days after rash onset.
    b. Use synthetic (non-cotton) swabs. Brands include Dacron® and Copan. This is the same type of swab used for influenza PCR testing.
    c. For a throat swab (preferred), swab tonsillar areas and posterior nasopharynx. Use a tongue blade to depress tongue to prevent contamination of the swab with saliva. For a nasopharyngeal swab, swab the nasal passage or the nasopharynx.
    d. Place the swab in 2-3 mL of standard, commercially available viral transport medium (VTM).
    e. Keep specimen(s) cold (4°C) and ship using ice packs.

2. **Urine**:

    a. Have the patient void directly into the container collecting from the first part of the urine stream is possible. First morning voided specimens are ideal but any urine collection is adequate.
    b. Collect 10-40 mL of urine in a sterile container.
    c. Keep specimens cold (4°C) and ship using ice packs

Serologic testing:
1. Blood should be collected as soon as possible after rash onset.
2. Collect 4-7 mL of whole blood in a red top or serum separator tube.
3. Keep specimens cold (4°C) prior to shipment. Specimen must be received within 24 hours of collection.

Specimen Testing:
1. Each specimen must be clearly labeled with the patient's name, date of birth, and date of collection.
2. Complete a MSDH Form 402 or 1252 for each specimen collected. The patient information on the specimen tube must match the patient information on the form.

Appendix O

Suspect Monkeypox (Non-Variola Orthopoxvirus) Virus Infection Testing

Specimen Requirements

Specimen Type	Dry Swabs ONLY (two for each lesion)
Collection	1. Use TWO separate dry swabs (either polyester, nylon, or Dacron) to collect infected cells from the base of the lesion by swabbing/brushing the lesion vigorously with the swab applicator. 2. Break off the swab applicator into an individual sterile container (conical tube, 1.5- or 2-mL screw-capped tube or urine cup). The swabs must be submitted dry; do NOT add any transport media to the container. 3. Place each specimen set (1 lesion) into a biohazard bag that contains an absorbent.
Storage and transport	1. Refrigerate (2–8°C) specimens within an hour of collection. 2. Refrigerated specimens must be shipped on cold packs in a cooler that is inside a rigid box and sent to the MPHL as a Category B infectious substance. Triple pack the specimens using the following procedure: a. Place each specimen set (1lesion) sealed biohazard bag into a leakproof secondary bag. b. Place sealed bag of specimens into a Styrofoam cooler containing frozen cold packs. Close the lid and place the Styrofoam cooler inside the sturdy box. If the box does not fit tightly, place additional material to fill the extra space. c. Place a list of contents and paperwork inside the cooler in a sealed water-proof bag. a. Specimens must be kept cold with cold ice packs. Several cold ice packs should be used to ensure specimens remain cold during transport to MPHL 3. Pre-packaged specimens may be delivered directly to the MPHL or can be dropped off at a local MSDH clinic for overnight delivery to the MPHL. Specimens should be shipped as soon as possible but must be received within 5 days of collection.
Submission information	A MPHL Miscellaneous Laboratory Examination Request **must** accompany each sample/collection site. Label the outside of all tubes with the patient's name, unique identifier, date of collection, source of specimen (vesicle/pustule) and collection site (face, left leg, etc).
Shipping Address	Mississippi Public Health Laboratory Attn: Molecular Diagnostics Section 570 East Woodrow Wilson Drive Jackson, MS 39216

*One dry swab will be tested at the MPHL for non-variola Orthopoxvirus. The CDC may provide *Monkeypox virus*-specific testing on the second dry swab specimen if the first dry swab is positive at the MPHL.

Specimen Collection
To collect vesicular and pustular material:

1. Sanitize the patient's skin with an alcohol wipe and allow skin to dry.
2. For each of the two dry swabs collected from each lesion, label a sterile container with the required information and remove swab from the outer sheath.
3. Collect cells from the lesion base by gently but firmly rolling the dry swab back and forth across the base of an uncapped lesion.
4. Place each swab into a separate sterile container and cap firmly. The container must NOT contain any transport media. The swab must be shipped dry.
5. Place both swab containers from the same lesion into a biohazard bag. Insert a completed MPHL Miscellaneous Laboratory Test Examination Request in the outside pocket of the biohazard bag. Seal the bag.
6. Repeat this process on different lesions.

7. After specimen collection is completed, all protective materials worn by the specimen collector (gloves, mask, gown, etc.) and all used sample collection materials (alcohol wipes, holders, etc.) must be placed in red biohazard bags and autoclaved or incinerated prior to disposal. **Thorough handwashing using soap** should be done immediately after specimen collection and following removal of personal protective equipment.
8. Specimens must be refrigerated or frozen within one hour of collection.

Infection Control Guidelines

Clinicians should employ a combination of standard, contact, and droplet precautions when assessing patients who present with fever and vesicular/pustular rash. Recommendations include wearing disposable gown and gloves for patient contact, using a NIOSH-certified N95 (or comparable) filtering disposable respirator that has been fit-tested, and using eye protection (e.g., face shields or goggles) if medical procedures may lead to splashing or spraying of a patient's body fluids. If a patient presenting for care at a hospital or other health care facility is suspected of having monkeypox, infection control personnel should be notified immediately.

For more information on infection prevention and control of monkeypox, please visit the CDC website for this situation at https://www.cdc.gov/poxvirus/monkeypox/outbreak/current.html or the monkeypox main information page at https://www.cdc.gov/poxvirus/monkeypox/index.html.

Result Reporting

All testing results will be reported back to the submitting facility identified on the MPHL Miscellaneous Laboratory Test Examination Request provided with the specimens within 3 to 5 days of submission. All MPHL testing results will be reported as final. Any additional testing performed by the CDC will be reported back only to the Office of Epidemiology.

Appendix P

MPHL Testing Capabilities List

Environmental Services		
Water Microbiology		
Standard/Analyte		**Method Number/Name**
Drinking Water		
Colilert	(Total coliform and E coli Presence/Absence)	SM9223B
Colilert 18	(Total coliform and E coli Presence/Absence)	SM9223B
Colisure	(Total coliform and E coli Presence/Absence)	SM9223B

P/A Broth/BG/ECMug (Total coliform and E coli Presence/Absence)	SM9221D + F
Quanti-Tray MPN (Total Coliform and Ecoli enumeration)	SM9223B-MPN
Recreational Surface Water	
Most Probable Number (MPN) by A1 (Fecal Coliform enumeration)	SM9221E A1
Bottled Water, Source Water	
Colilert (Total coliform and E coli Presence/Absence)	SM9223B
Bottled Water, Product Water	
Quanit-Tray MPN (Total Coliform enumeration and when requested, Ecoli enumeration)	SM9223B-MPN
Bottled Water Containers	
Bottled Water, Caps and Containers Colony Forming Units (CFU) (Federal Register Title 21, part 129 & 165)	Modified FDA 2400i, 2400k
Source Water for PWS that use Surface water or ground water under direct influence of surface water (40 CFR 141.704(b))	
Long Term 2 Enhanced Surface Water Treatment Rule (LT2) (Total coliform and E coli Presence/Absence)	SM9223B-MPN Colilert/Colilert 18
Reagent Grade Water Quality Monitoring	
Conductivity	Mettler Conductivity Meter, EPA cert manual, FDA 2400
Chlorine Residual	ThermoScientific Orion meter, EPA cert manual, FDA 2400
Heterotrophic Bacteria enumeration by Heterotrophic Plate Count	SM9215 (Simplate 2000)

Dairy

Standard/Analyte*	Method Number/Name
Finished Product (FP) Milk	
Butterfat Content per MS Code	Gerber
Solids Not Fat (SNF) per MS Code	The Market-Milk Industry, 1941, p.551
Freezing Point per MS Code	SM for Examination of Dairy Products 15.032
Petrifilm Aerobic Plate Count (PAC)	FDA 2400a-4
Petrifilm Coliform Count (PCC, HSCC)	FDA 2400a-4
Microbial Inhibitor Assay- Delvotest-P 5 Pack visual	FDA 200b-3
Alkaline Phosphatase Test- Fluorophos	FDA 2400j-1
Aseptically Processed Milk and Milk Products (Boxed Milk-unrefrigerated)	
Butterfat Content per MS Code	Gerber
Freezing Point per MS Code	SM for Examination of Dairy Products 15.032
Raw Milk	
Petrifilm Aerobic Plate Count (PAC)	FDA 2400a-4
Microbial Inhibitor Assay- Delvotest-P 5 Pack visual	FDA 200b-3
Antibiotic Residue-Idexx New SNAP Beta-Lactam Test	FDA 2400n-2
Direct Microscopic Somatic Cell Count	FDA 2400d
Electronic Somatic Cell Count-Foss Minor	FDA 2400h-5
In-Plant Raw and Heat Treated Cream (RAW)	
Petrifilm Aerobic Plate Count (PAC)	FDA 2400a-4
Microbial Inhibitor Assay- Delvotest-P 5 Pack	FDA 200b-3
Antibiotic Residue-Idexx SNAP Beta-Lactam Test	FDA 2400n-2
Bulk Tank and Raw Milk Producer Traceback	
Drug Residue (Appendix N)	FDA 2400n
Dairy Containers	
Dairy, Pasteurized Milk Containers	FDA 2400i and 2400a-4
Dairy Water- Well Samples	

Colilert	(Total coliform and E coli Presence/Absence)	SM9223B + FDA2400m
Colilert 18	(Total coliform and E coli Presence/Absence)	SM9223B + FDA2400m
Colisure	(Total coliform and E coli Presence/Absence)	SM9223B + FDA2400m
Dairy Water- Sweetwater/Glycol Samples		
Fermentation test	(Total Coliform Presence/Absence)	FDA2400m-Fermentation test

*Raw/ FP milk standards based on FDA documents M-a-98, PMO, M-a-85

Chemistry

Standard/Analyte	Method Number
Drinking Water/Volatiles: Regulated	
Benzene	EPA 524.2
Carbon tetrachloride	EPA 524.2
Chlorobenzene	EPA 524.2
1,2-Dichlorobenzene	EPA 524.2
1,4-Dichlorobenzene	EPA 524.2
1,2-Dichloroethane	EPA 524.2
1,1-Dichloroethylene	EPA 524.2
cis-1,2-Dichloroethylene	EPA 524.2
trans-1,2-Dichloroethylene	EPA 524.2
1,2-Dichloropropane	EPA 524.2
Ethylbenzene	EPA 524.2
Methylene chloride (Dichloromethane)	EPA 524.2
Styrene	EPA 524.2
Tetrachloroethylene	EPA 524.2
Toluene	EPA 524.2
1,2,4-Trichlorobenzene	EPA 524.2
1,1,1-Trichloroethane	EPA 524.2
1,1,2-Trichloroethane	EPA 524.2
Trichloroethylene	EPA 524.2
Vinyl chloride	EPA 524.2
Xylenes, total	EPA 524.2
Drinking Water/Volatiles: Unregulated	
Bromobenzene	EPA 524.2
Bromochloromethane	EPA 524.2
Bromomethane	EPA 524.2
n-Butylbenzene	EPA 524.2
sec-Butylbenzene	EPA 524.2
tert-Butylbenzene	EPA 524.2
tert-Butylmethyl ether (MTBE)	EPA 524.2
Chloroethane	EPA 524.2
Chloromethane	EPA 524.2
2-Chlorotoluene	EPA 524.2
4-Chlorotoluene	EPA 524.2
Dibromomethane	EPA 524.2
1,3-Dichlorobenzene	EPA 524.2
Dichlorodifluoromethane	EPA 524.2
1,1-Dichloroethane	EPA 524.2
1,3-Dichloropropane	EPA 524.2
2,2-Dichloropropane	EPA 524.2
1,1-Dichloropropene	EPA 524.2

cis-1,3-Dichloropropene	EPA 524.2
trans-1,3-Dichloropropene	EPA 524.2
Fluorotrichloromethane	EPA 524.2
Hexachlorobutadiene	EPA 524.2
Isopropylbenzene	EPA 524.2
4-Isopropyltoluene	EPA 524.2
Naphtalene	EPA 524.2
n-Propylbenzene	EPA 524.2
1,1,1,2-Tetrachloroethane	EPA 524.2
1,1,2,2-Tetrachloroethane	EPA 524.2
1,2,3-Trichlorobenzene	EPA 524.2
1,2,3-Trichloropropane	EPA 524.2
1,2,4-Trimethylbenzene	EPA 524.2
1,3,5-Trimethylbenzene	EPA 524.2
Drinking Water/Halomethanes	
Bromodichloromethane	EPA 524.2
Bromoform	EPA 524.2
Chlorodibromomethane	EPA 524.2
Chloroform	EPA 524.2
Drinking Water/Regulated Pesticides	
Aldrin	EPA 505
Dieldrin	EPA 505
Endrin	EPA 505
Heptachlor	EPA 505
Heptachlor epoxide (beta)	EPA 505
Hexachlorobenzene	EPA 505
Hexachlorocyclopentadiene	EPA 505
gamma-BHC (Lindane)	EPA 505
Methoxychlor	EPA 505
Trifluralin	EPA 505
Drinking Water/Toxaphene	
Toxaphene	EPA 505
Drinking Water/Chlordane, technical	
Chlordane, technical	EPA 505
Drinking Water/EDB/DBCP/1,2,3-TCP	
Dibromochloropropane (DBCP)	EPA 504.1
Ethylene Dibromide (EDB)	EPA 504.1
1,2,3-Trichloropropane (1,2,3-TCP)	EPA 504.1
Drinking Water/PCBs	
PCB as Decachlorobiphenyl	EPA 505
PCB Aroclor Identity	EPA 505
Aroclor 1016	EPA 505
Aroclor 1221	EPA 505
Aroclor 1232	EPA 505
Aroclor 1242	EPA 505
Aroclor 1248	EPA 505
Aroclor 1254	EPA 505
Aroclor 1260	EPA 505
Drinking Water/Regulated Semivolatiles #1	
Benzo(a)pyrene	EPA 550.1
bis(2-Ethylhexyl)adipate	EPA 525.2
bis(2-Ethylhexyl)phthalate	EPA 525.2

Drinking Water/Regulated Semivolatiles #2	
Diquat	EPA 549.2
Endothall	EPA 548.1
Glyphosate	EPA 547
Paraquat	EPA 549.2
Drinking Water/Regulated Herbicides	
Acifluorfen	EPA 515.4
2,4-D	EPA 515.4
Dalapon	EPA 515.4
Dichloroprop	EPA 515.4
Dicamba	EPA 515.4
Dinoseb	EPA 515.4
Pentachlorophenol	EPA 515.4
Picloram	EPA 515.4
2,4,5-TP (Silvex)	EPA 515.4
Drinking Water/Carbamates	
Aldicarb	EPA 531.2
Aldicarb sulfone	EPA 531.2
Aldicarb sulfoxide	EPA 531.2
Baygon	EPA 531.2
Carbaryl	EPA 531.2
Carbofuran	EPA 531.2
3-Hydroxycarbofuran	EPA 531.2
Methiocarb	EPA 531.2
Methomyl	EPA 531.2
Oxamyl (Vydate)	EPA 531.2
Drinking Water/Haloacetic Acids	
Bromoacetic acid	EPA 552.2
Bromochloroacetic acid	EPA 552.2
Chloroacetic acid	EPA 552.2
Dibromoacetic acid	EPA 552.2
Dichloroacetic acid	EPA 552.2
Trichloroacetic acid	EPA 552.2
Drinking Water/Metals	
Aluminum	EPA 200.8
Antimony	EPA 200.8
Arsenic	EPA 200.8
Barium	EPA 200.8
Beryllium	EPA 200.8
Cadmium	EPA 200.8
Chromium	EPA 200.8
Copper	EPA 200.8
Iron	EPA 200.8
Lead	EPA 200.8
Manganese	EPA 200.8
Molybdenum	EPA 200.8
Nickel	EPA 200.8
Selenium	EPA 200.8
Silver	EPA 200.8
Thallium	EPA 200.8
Zinc	EPA 200.8
Drinking Water/Mercury	
Mercury	EPA 200.8

Mercury	EPA 245.1
Drinking Water/Uranium	
Uranium (Nat)	EPA 200.8
Drinking Water/pH	
pH	EPA 150.1
Drinking Water/Inorganics	
Alkalinity as $CaCO_3$	SM 2320B
Conductivity at 25C	SM2510B 21st ED 1997
Chloride	EPA 300.0
Fluoride	EPA 300.0
Fluoride	QC10-109-12-2A
Nitrate as N	QC10-107-04-1C
Nitrate + Nitrite as N	QC10-107-04-1C
Nitrate + Nitrite as N	EPA 200.8
Nitrite as N	QC10-107-04-1C
Potassium	EPA 200.8
Sulfate	EPA 300.0
Drinking Water/Turbidity	
Turbidity	EPA 180.1
Drinking Water/Cyanide	
Cyanide	QC10-204-00-1X
Cyanide	ME355.01
Drinking Water/Chlorite	
Chlorite	EPA 300.1
Drinking Water/Bromide / Bromate	
Bromide	EPA 300.1
Bromate	EPA 300.1
Drinking Water/Hardness	
Calcium	EPA 200.8
Magnesium	EPA 200.8
Sodium	EPA 200.8

Clinical Services

Test Name	Acceptable Specimens	CPT Code	TAT
Fecal Ova & Parasite Exam, Concentration & Trichrome	Stool collected in PVA preservative, 10% formalin and/or Trichrome stained slide	87209	1-5 business days
Fecal Ova & Parasite Exam, Concentration & Microscopy Acid Fast Stain	Stool collected in 10% formalin preservative	87177, 87206 , 87207	1-5 business days
Malaria Blood Parasites	Giemsa or Wright stained thick and thin blood smears plus EDTA whole blood	87207	1-5 business days
West Nile Virus (WN), IgM EIA	2 mL Serum and/or 2 mL CSF	86788	5-20 business days
St. Louis Encephalitis (SLE) Virus, IgM EIA	2 mL Serum and/or 2 mL CSF	86653	5-20 business days
LaCrosse Encephalitis Virus, IgM EIA	2 mL Serum and/or 2 mL CSF	86651	5-20 business days
Zika Virus, IgM EIA	2 mL Serum or 2 mL Serum and CSF	86790	5-10 business days

Dengue Virus, IgM EIA	2 mL Serum or 2 mL Serum and CSF	86790	5-10 business days
Chikungunya Virus, IgM EIA	2 mL Serum or 2 mL Serum and CSF	86790	5-10 business days
Arbovirus RT-PCR for Zika, Dengue, and Chickungunya Virus	2 mL Serum or 2 mL Serum and CSF or 2 mL serum and 1 mL urine	87798	3 business days
Bacillus anthracis	Clinical Specimens- aseptically collected lesions or eschar aspirates, whole blood in EDTA, serum, plasma, tissue, tissue biopsies in screw-capped tube (with or without swab used to collect sample), stool or rectal swab(s), sputum, pleural fluid, and transtracheal aspirates or washes. Culture- pure growing culture isolate on an appropriate agar slant in a screw capped tube; blood culture isolate. Environmental samples as submitted by law enforcement personnel	87798, 87070	1 to 10 business days
Brucella species	Clinical Specimens: EDTA whole blood, serum, tissue (spleen, liver), joint fluid, abscesses, exudates. Culture: pure growing culture isolate on an appropriate agar slant in a screw capped tube, bone marrow culture, blood culture. Environmental samples submitted by law enforcement personnel	87798, 87070	1 to 10 business days
Burkholderia mallei/pseudomallei species	Clinical Specimens: EDTA whole blood, serum, sputum, bronchial aspirates, abscess material, wound swabs, urine Culture: pure growing culture isolate on an appropriate agar slant in a screw capped tube, bone marrow culture, blood culture. Environmental samples submitted by law enforcement personnel.	87798, 87070	1 to 10 business days
Yersinia pestis	Clinical Specimens- aseptically collected lymph node tissue or aspirate, tissue from liver, spleen, or lung, whole blood in EDTA, sputum, pleural fluid, and transtracheal aspirates or washes. Culture- pure growing culture on a appropriate agar slant in a screw capped tube; blood culture. Environmental samples submitted by law enforcement personnel	87798, 87070	1 to 10 business days
Bordetella pertussis, Parapertussis, and Bordetella holmesii Polymerase Chain Reaction (PCR)	Polyester, rayon or nylong flocked dry Nasopharyngeal swab with metal/plastic shafts	87798	3 business days
Toxic Element Screen by ICP/MS	Urine	83018	1 to 5 business days
Volatile Organic Compuounds by GC/MSD	Whole blood	84600	1 to 5 business days
Cadmium, Mercury, and Lead by ICP/MS	Whole blood	82300, 83825, 83655	1 to 5 business days
Abrine Ricine by LC-MS/MS	Urine	82542	1 to 5 business days
Cyanide by GC/MSD	Whole blood	82600	1 to 5 business days
Tetramine by GC/MSD	Urine	82542	1 to 5 business days
Organophosphate Nerve Agents metabolites (OPNA) by LC-MS/MS	Urine	82542	1 to 5 business days
HNPAA (Tetranitromethanes) by LC-MS/MS	Urine	82542	1 to 5 business days
BUN	Serum in gold topped SST	84520	4 business days
Creatinine	Serum in gold topped SST	82565	4 business days
Uric Acid	Serum in gold topped SST	84550	4 business days

AST	Serum in gold topped SST	84450	4 business days
ALT	Serum in gold topped SST	84460	4 business days
Total Bilirubin	Serum in gold topped SST	82247	4 business days
Total Cholesterol	Serum in gold topped SST	82465	4 business days
HDL Cholesterol	Serum in gold topped SST	83718	4 business days
Triglyceride	Serum in gold topped SST	84478	4 business days
Calculated LDL Cholesterol	Serum in gold topped SST	=8<76	4 business days
CRE. CRPA, CRAB	Pure isolate	87798, 87185	4 to 14 business days
Miscellaneous isolate identification	Pure isolate	87077, 87076	4 to 14 business days
Enteric Isolate Identification (Salmonella, Shigella, Campylobacter, E.coli	Pure isolate	87077	4 to 14 business days
Salmonella serotyping	Pure isolate	87147, 87152	7 to 30 business days
Shigella serotyping	Pure isolate	87147	7 to 21 business days
Shiga Toxin producing E. coli serotyping and toxin detection	Pure isolate	87147, 87335	7 to 21 business days
Chlamydia (CT) and Gonorrhea (GC)	Endocervix, rectal, throat, or urethra swasbs; male and female urine	8759, 87491	5 business days
Cholera and Non-Cholera Vibrio spp. Identification (biochemicals and serotyping)	Stool in Carey-Blair, pure isolates	87077, 87147	7 to 21 business days
CBC without differential	2 mL EDTA Whole blood	85027	3 business days
Glucose, fasting or routine	3 mL EDTA fluoride whole blood (Gray top)	82947	4 business days
Measles RT-PCR	Throat/NP swab in VTM, Urine	87798	3 business days
Mumps RT-PCR	Buccal swab in VTM	87798	3 business days
Rabies Detection Direct Fluorescent Antibody (DFA)	Whole Bat, Small animal brain	N/A	4 business days
CBC with differential	2 mL EDTA Whole blood	85025	3 business days
Hepatitis A, IgM	2 mL serum in red top or SST tube	86709	5 business days
Hepatitis A, Total	2 mL serum in red top or SST tube	86708	5 business days
Hepatitis B Core Antibody	2 mL serum in red top or SST tube	86704	5 business days
Hepatitis B Core IgM Antibody	2 mL serum in red top or SST tube	86705	5 business days
Hepatitis B Surface Antibody (Ab)	2 mL serum in red top or SST tube	86706	5 business days
Hepatitis B Surface Antigen (Ag)	2 mL serum in red top or SST tube	87340	5 business days
Hepatitis C (HCV)	2 mL serum in red top or SST tube	86803	5 business days
Diptheria Culture	Swab in transport media	87077	5 to 14 business days
Neisseria meningitidis Identification and serotyping	Pure isolate	87077, 87147	5 business days
Aerobic Isolation from Clinical Specimen	Various	87077	5 to 14 business days
Blood Lead	EDTA Whole Blood (capillary or venous)	83655	10 working days
Hematocrit	EDTA Whole blood	85014	3 business days
Hemoglobin	EDTA Whole blood	85018	3 business days
Haemophilus influenzae identification and serotyping	Pure isolate	87077, 87147	5 working days

Acid Fast Bacilli (AFB) Culture	Sputum, Bronchial Washings, Fluids, Tissue, Urine, Stool, Gastic Lavages, CSF, and BAL	87015, 87206	Up to 60 working days
Acid Fast Bacilli (AFB) smear	Sputum, Bronchial Washings, Fluids, Tissue, Urine, Stool, Gastic Lavages, CSF, and BAL	87116	2 working days
Acid Fast Bacilli (AFB) Isolate Identification; High-Performance Liquid Chromatography (HPLC)	Pure isolate on solid or in broth media	87143	Up to 60 working days
Acid Fast Bacilli (AFB) Isolate Identification; Probe	Pure isolate on solid	87149	Up to 60 working days
Mycobacterium tuberculosis susceptibility	Pure isolate of MTBC on solid or broth media	87188	14-28 days
Mycobacterium tuberculosis complex PCR	Sputum, BAL	87556	2 business day
Mycobacterium tuberculosis Genotyping Referral	Pure isolate of MTBC on solid media	N/A	N/A
Mumps Virus IgG	2 mL serum in red top or SST	86135	3 business days
Influenza SARS-CoV RT-PCR	Nasopharyngeal swabs, nasal swabs in VTM	87502	5 business days
Influenza A subtypes	Nasopharyngeal swabs, nasal swabs in VTM positive for influenza A	87503	5 business days
Influenza B genotypes	Nasopharyngeal swabs, nasal swabs in VTM positive for influenza B	87503	5 business days
QuantiFERON -TB Gold Plue (IGRA)	Serum collected in QuantiFERON tubes	86480	5 business days
hCG, quantitative	2 mL Serum in red top or SST	84702	5 business days
HIV-1 and 2 antibody screen with reflex confirmation	2 mL Serum in red top or SST	86703, 86701, 86702, 87535	10 business days
Measles Antibody, IgG and IgM	2 mL serum in red top or SST tube	86765	3 business days
Norovirus by RT-PCR	Fresh stool, vomit	87792	3 business days
Pertussis culture	Synthetic swab in Regan Lowe transport media	87081, 87265, 87077	10 business days
Pinworm slide	Scotchtape prep	87172	5 business days
RPR routine	2 mL serum in red top or SST	86592	5 business days
RPR quantitative reflex	2 mL serum in red top or SST	86592	1 business days
Syphilis Confirmation Particle Agglutination (TP-PA)	2 mL serum in red top or SST	86780	5 business days
Shigella identification	Pure Isolate	87077, 87147, 87152	14 business days
Throat Culture (Group A Streptococci)	Dry swab in silica gel	87070	5 business days
Varicella Zoster Virus PCR	Vesicular tissue and fluid, scabs or dacron swab from unroofed vesicle	87798	3 business days
Vaccinia Virus by PCR	Vesicular swabs and scabs from crusted lesions	87801	3 business days
Giardia/Cryptosporidium DFA	Stools in 10% formalin, SAF, or Ecofix	87015, 87272, 87329	5 business days
Coxiella burnetti PCR	Clinical Specimens: EDTA whole blood, serum	87798	2 business days
Francisella tularensis PCR	Clinical Specimens: tissue, scraping of ulcer, swab(s) of ulcer, lymph node aspirate, tissue aspirates, pleural fluid, EDTA whole blood, and respiratory samples. Culture: pure growing culture isolate on an appropriate agar slant in a screw capped tube or blood culture . Environmental samples submitted by law enforcement personnel	87798, 87070	10 business days
Respiratory Virus Panel by PCR	NP swab in viral transport media	87633, 87798, 87486, 87581 (x20)	3 business day

Gastrointestinal Panel by PCR	Stool in Carey Blair, ETM, or modified Cary Blair media	87150 x 22	3 business day
Meningitis/Encephalitis Panel	300 µL CSF	87798x7, 87653, 87496, 87532, 87529 x 2	3 business day
Food poisoning testing- bacterial or viral	Varies depending on food type. Contact the laboratory for assistance	87070, 87798	14 business days
Bacterial Culture, aerobic	Culturette	87070, 87798	3 to 14 business days
SARS-CoV-2 Molecular Testing	Nasopharyngeal, oropharyngeal or nasal swab in viral transport media or saline (PBS)	87635	5 business days
Non-Variola Orthopoxvirus (suspect Monkeypox)	Two separate dry swabs (either polyester, nylon, or Dacron)	=<:>8	5 business days
Trichomonas vaginalis	male and female urine	188052	5 business days

Appendix Q

Drinking Water Fluoride Sample Collection Guide

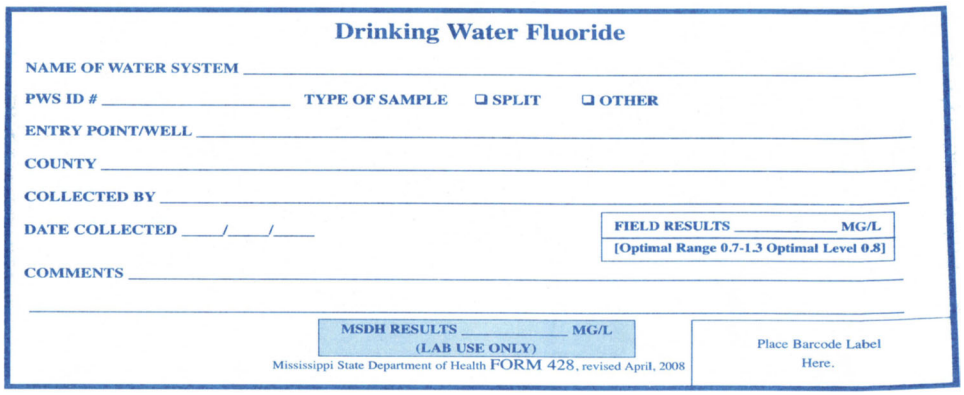
A. Split Sample Collection:

Use bottles provided by the MSDH only.

- **Do not use a bottle if the shrink-wrap has been tampered with or removed.**
- **Obtain additional bottles from the local County Health Department**
- **It is normal for a small amount of white powder or clear moisture to appear on the inside of the bottle. This is sodium thiosulfate. DO NOT RINSE THE BOTTLE PRIOR TO COLLECTING THE SAMPLE.**

1. Collect sample from entry point unless your MSDH regional engineer has instructed you to collect from a different location.
2. Flush the line to clear it of any debris.
3. Grab a sample in a clean container large enough to fill the sample bottle to the fill line and to complete the field test.
4. Allow the sample to reach room temperature or to reach the same temperature as your de-ionized (DI) water.
5. Using your field test kit, analyze a small amount of the sample.
6. If the result is within optimal range record the field result in the appropriate blank on the form 428.
7. If result is out of range, check your equipment settings and fluoride chemicals, and repeat steps 1 - 6.
8. Once the field sample result value is found to be in range pour the sample into the 100 ml plastic sample bottle. Fill just slightly above the "fill line" and secure the cap.
9. Turn bottle upside down to assure bottle is properly sealed.

B. MSDH Form 428 Instructions



Drinking Water Fluoride

NAME OF WATER SYSTEM _____

PWS ID # _____ TYPE OF SAMPLE ❑ SPLIT ❑ OTHER

ENTRY POINT/WELL _____

COUNTY _____

COLLECTED BY _____

DATE COLLECTED ____/____/____

FIELD RESULTS _____ MG/L
[Optimal Range 0.7-1.3 Optimal Level 0.8]

COMMENTS _____

MSDH RESULTS _____ MG/L
(LAB USE ONLY)

Mississippi State Department of Health FORM 428, revised April, 2008

Place Barcode Label Here.

1. Place an "X" in the box that corresponds to the type of sample you are collecting (split or other).

Split Check **Split** box for all samples taken to meet monthly fluoridation sampling requirements and required resamples.

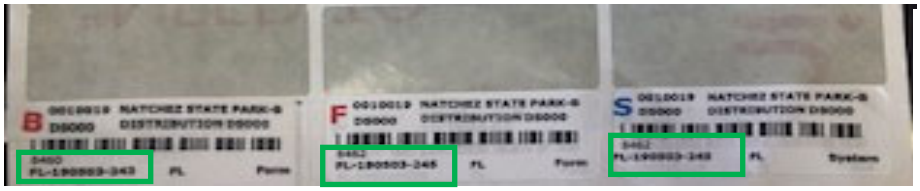
Other Check Other box for all monitoring, complaints, and when instructed by MSDH.

2. Enter the Name of the System, the 7 digit (i.e. 0010001) public water supply ID number (PWSID) and the entry point/well location. Please skip these fields when using MSDH-provided barcode.
3. Enter the first and last name of the individual collecting the sample in the "Collected by" blank.
4. Enter the date the sample was collected. Ex: 03/15/2020.
5. Enter the field result in the blank. Ex: __0.8___mg/L
6. Use the comment field only if needed.

7. Do not write below the FOR LAB USE ONLY line. This space is for laboratory reporting of results in the event electronic/printed reports are not available.

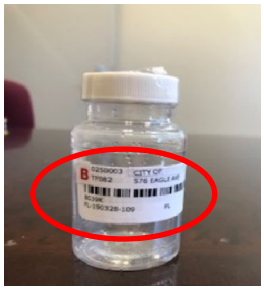
C. Barcode Label Placement, Box Custody/Integrity Seal and Address Label and Sample Submission

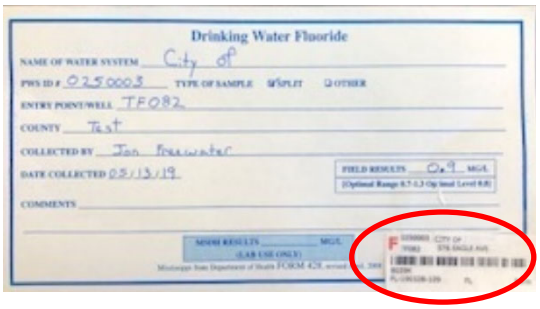
1. Use barcode labels provided by the Bureau of Public Water Supply which specify your PWSID, system name, and entry point. Each entry point will require 3 labels (a **B**, **F** and **S** label) or one row of labels. Two rows of barcode labels (one row of labels have been used and is empty) are shown below. The barcode number (located in the square below) will be the same for all labels in a row.

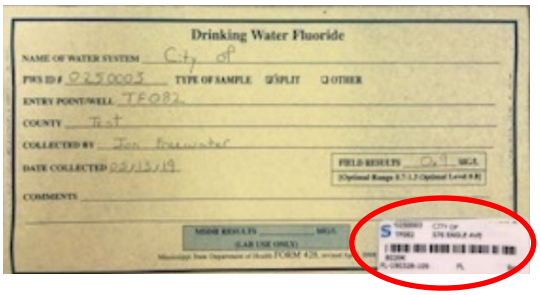


Call the Bureau of Public Water Supply at 601-576-7518 to order more barcode labels before you exhaust your supply. Please do not run out of barcode labels.

2. Remove the labels from left to right across the page.
3. Place Label **"B"** on your sample **bottle**. (B is red on the label)
4. Place Label **"F"** on your Form 428 in the box in the lower righthand corner. (F is red on the label)
5. Place Label **"S"** on your yellow copy of **Form 428** and retain for your records. (S is blue on the label)



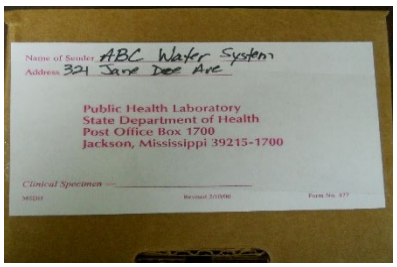




6. The number <u>below the barcode on the bottle</u> matches the number <u>below the barcode on the Form 428</u>. **If the bottle label and the form label do not match, the lab must reject the sample.**
7. Place your sample(s) in the 2, 6 or 12 pack boxes that are provided by MSDH through your county health department. Place completed Form 428 on top of the bottle.
8. Repeat this process for each sample you have collected.
9. After placing your samples in a box, affix two signed and dated QEC custody/integrity seals to each box submitted.
   a. For the 6 or 12-pack box, place one signed and dated custody/integrity seal on the top seam and one signed and dated custody/integrity seal on the bottom seam of the box. When a previously used custody/integrity seal is already applied to the bottom of the 6 or 12-pack shipping box, draw a single line through the seal with a marker.

   b. For the 2-pack box place a signed and dated custody/integrity seal across both of the two (top) side seams on the box (see picture 3).

c. Affix a MSDH Public Health Laboratory address label to each box (see picture 4). Make sure that the address label does not cover your signature and date on the custody/integrity seals. Address labels are available at the local county health department. Do NOT rely on county health department staff to affix the address label.



10. Use only clear shipping tape to seal the sample box and to cover the custody/integrity seals.
11. Submit the samples to your county health department. Be sure to log samples in the county log books.
12. Sample bottles, boxes, Forms 428, custody/integrity seals, and address labels are available at the County Health Department. **Barcode labels must be ordered from the Bureau of Public Water Supply.**
13. **DO NOT leave samples to be boxed by county personnel.** You are responsible for packaging and labeling all your samples.
14. Failure to follow these instructions will cause your samples to be rejected.

If you do not have any MSDH Barcode labels or have any questions, please contact the Bureau of Public Water Supply at 601-576-7518 immediately.

Appendix R

Drinking Water Microbiology (Bact) Sample Collection Guide

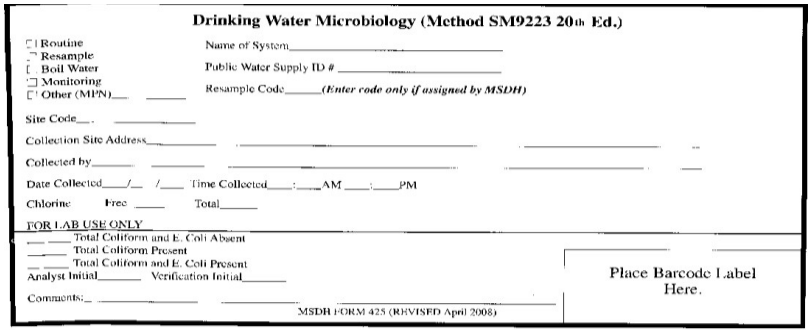
A. Sample Collection:

Use bottles provided by the MSDH only.

- **Do not use a bottle if the shrink-wrap has been tampered with or removed.**
- **Obtain additional bottles from the local County Health Department**
- **It is normal for a small amount of white powder or clear moisture to appear on the inside of the bottle. This is sodium thiosulfate and is required for the process. DO NOT RINSE THE BOTTLE PRIOR TO COLLECTING THE SAMPLE**

1. Start by selecting an outside faucet (one that is on the public water system site plan if this is a Routine sample).
   - If the faucet is leaking, select another outside faucet (one that is on the public water system site plan if this a Routine sample).
2. Flush the distribution line.
3. Torch the faucet.
   - If a torch is not available, then use an isopropyl alcohol swab to clean the inside of the faucet
4. Flush the faucet.
5. Adjust the faucet to a slow steady stream.
6. Wear gloves when collecting samples.
7. DO NOT rinse the bottles.
8. Take your time and make sure not to contaminate the bottle or cap.
9. Carefully remove the shrink-wrap and the cap.
10. DO NOT touch the neck of the bottle, the inside areas of the bottle, or inside the cap.
11. Continue holding the cap by its outside edges only.
12. Place the bottle underneath the stream of water.
13. Fill the sample bottle to just above the fill line.
14. DO NOT fill to the neck of the bottle.
    - If the bottle is over-filled, throw it away.
    - Obtain a new bottle and fill to the proper level.
15. Place the cap on the bottle immediately. Do not over-tighten.
16. Turn bottle upside down to make sure the cap is securely fastened.

B. MSDH Form 425 Instructions for Drinking Water Microbiology Samples



Drinking Water Microbiology (Method SM9223 20th Ed.)

☐ Routine
☐ Resample
☐ Boil Water
☐ Monitoring
☐ Other (MPN)___ ____

Name of System_____
Public Water Supply ID # _____
Resample Code_____ *(Enter code only if assigned by MSDH)*

Site Code___. _____
Collection Site Address_____ _____ _____ _____
Collected by_____ _____ _____ _____ ___
Date Collected___/___ /___ Time Collected___:___AM ___:___PM
Chlorine Free _____ Total_____

FOR LAB USE ONLY
___ ___ Total Coliform and E. Coli Absent
___ ___ Total Coliform Present
___ ___ Total Coliform and E. Coli Present
Analyst Initial_____ Verification Initial_____

Comments:_ _____ _____ _____

Place Barcode Label Here.

MSDH FORM 425 (REVISED April 2008)

1. Check the box associated with the type of sample you are collecting (routine, resample, boil water, monitoring, other) as defined below.

□ Routine	Check **Routine** box for a sample collected to meet monthly sampling requirements
□ Resample	Check **Resample** box for a sample collected after a TC+ or EC+ sample or if instructed by MSDH. Record MSDH assigned resample code for distribution samples.
□ Boil Water	Check **Boil Water** box for samples collected to clear a boil water notice event
□ Monitoring	Check **Monitoring** box for samples collected for customer complaints, new line checks, construction, putting a tank back in service or for samples that should not be used for compliance. Use to clear a well.
□ Other (MPN)	Check Other box when requesting a MPN (coliform enumeration). Must contact MSDH Bureau of Public Water Supply at 601-576-7518 prior to collection.

1. Enter the Name of the System and the 7 digit (i.e., 0010001) public water supply ID number (PWSID). Please leave blank if using a MSDH-provided barcode that provides information.
2. Enter sample location that corresponds to your microbiological sample site plan if collecting routine or resamples and the 911 address or descriptive location for all other samples.
3. Enter the first and last name of the individual collecting the sample.
4. Enter the date and time collected. **Circle AM or PM.**
5. **Please enter both free and total chlorine residual.**
6. Do not write below the FOR LAB USE ONLY line. This space is for laboratory reporting of results in the event electronic/printed reports are not available.

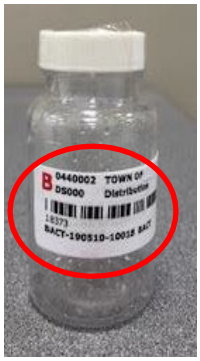
C. Barcode Label Placement, Box Custody/Integrity Seal and Address Label and Sample Submission

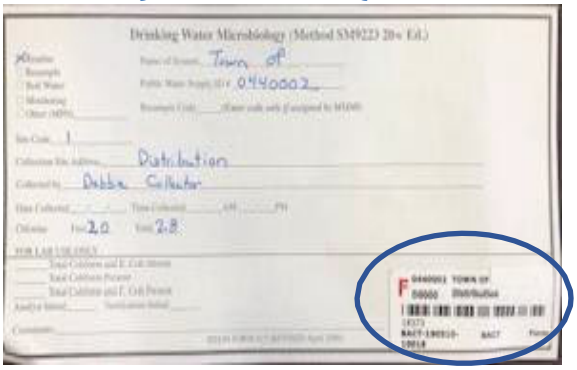
1. Use barcode labels provided by the Bureau of Public Water Supply which specify your PWSID and system name. Each sample will require 3 labels (a **B**, **F** and **S** label) or one row of labels. Four rows of barcode labels (one row of labels have been used and is empty) are shown below. The barcode number (located in the square below) should be the same for all labels in a row.

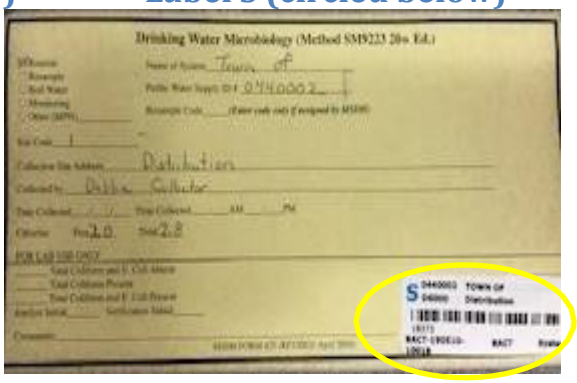
Call the Bureau of Public Water Supply at 601-576-7518 to order more barcode labels before you have exhausted your supply. Please do not run out of barcode labels.

2. Remove the labels from left to right across the page, starting with the B label and ending with the S label.
3. Place Label **"B"** on your sample **bottle**. (**B** is red on the label)
4. Place Label **"F"** on your **Form 425** in the box in the lower right-hand corner. (**F** is red on the label)
5. Place Label "**S**" on the yellow copy of **Form 425** and retain for your records. (**S** is blue on the label)

Label B (circled below) **Label F (circled below)** **Label S (circled below)**





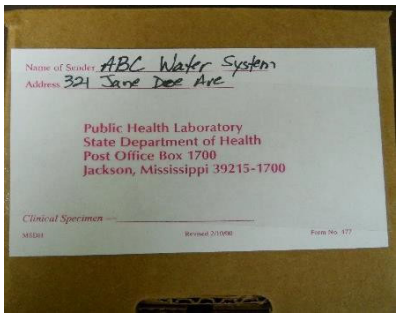


6. The number below the barcode on the bottle must match the number below the barcode on the Form 425. If they do not match, the lab must reject the sample.
7. Place the sample bottles in the shipping box. Place the Form 425 on top of the bottles.
8. Repeat this process for each sample you have collected.
9. Place your sample(s) in the 2 or 12 pack boxes that are provided by MSDH through your county health department.
10. Affix two signed and dated QEC custody/integrity seals to each box submitted.
    a. For the 12-pack box place one signed and dated custody/integrity seal on the top seam and one signed and dated custody/integrity seal on the bottom seam of the box. When a previously used custody/integrity seal is already applied to the bottom of the 12-pack shipping box, draw a single line through the seal with a marker.

    b. For the 2-pack box place a signed and dated custody/integrity seal across each of the two (top) side seams on the box.

    c. Affix a MSDH Public Health Laboratory address label to each box. Make sure that the address label does not cover your signature and date on the custody/integrity seals. Address labels are

available at the local county health department. Do NOT rely on county health department staff to affix the address label.



11. Use clear shipping tape to seal the sample box and to cover the custody/integrity seals.
12. Submit the samples to your county health department. Be sure to log samples into county log books.
13. Sample bottles, boxes, Form 425, custody/integrity seals, and address labels are available at the County Health Department. **Barcode labels must be ordered from the Bureau of Public Water Supply.**
14. **DO NOT leave samples to be boxed by MSDH county clinic personnel.** You are responsible for packaging and labeling all your samples.
15. Failure to follow these instructions will cause your samples to be rejected.

If you do not have any MSDH Barcode labels or have any questions, please contact the Bureau of Public Water Supply at 601-576-7518 immediately

Appendix S

How to deliver local samples to the Dr. F. E. "Ed" Thompson, Jr. Public Health Laboratory Monday-Friday, 8am – 4:30 pm.

1. Go west on Woodrow Wilson past North State Street. Turn into the 2nd MSDH entrance off Woodrow Wilson Drive. A sign in front of the entrance states "MSDH Laboratory Deliveries Dock".

2. Drive to the end of the driveway and park in 1 of the 2 parking spaces directly in front of the closed gates to the MSDH garage. After exiting your vehicle, walk towards the building dock (located directly behind you). Continue walking into the dock area until you see stairs to the right.

3. Walk up the stairs. At the top of the stairs, you will see the sample receiving door. Press the white call button next to the door to notify the MPHL front desk that you have samples to deliver. The front desk staff will remotely open the door.

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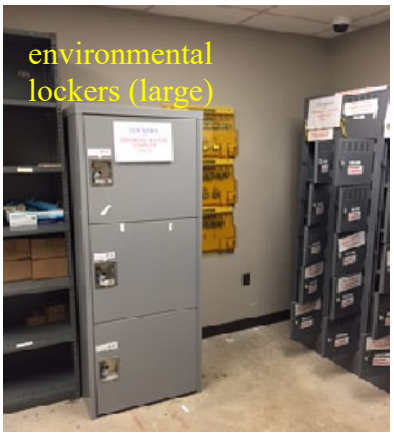
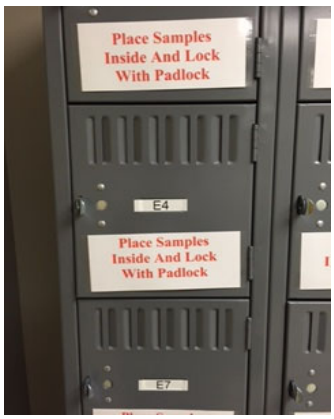
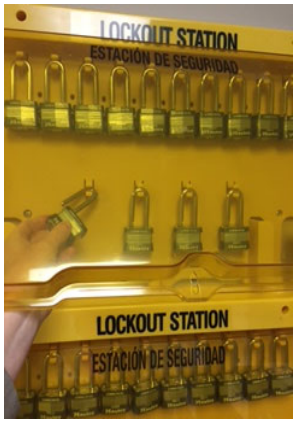
5. After entering room, place sample(s) inside either a clinical services (patient samples) or an environmental services (drinking water) locker. Clinical services lockers are labeled as C1-C18. Environmental Services lockers for smaller drinking water samples are labeled as E1-E18. A separate locker is available for larger drinking water samples. Locks for the small lockers are located in the yellow lockout station. Locks for the large lockers are already hanging in the locker doors.



6. After placing your sample in the appropriate locker, remove a lock from the yellow lockout station. Insert a lock into the locker door and push lock close. **Do not leave samples in an unlocked locker or unattended outside a locker.**





7. Record your delivery on either a clinical services (patient samples) or environmental services (drinking water samples) log located on the table next to the door. MPHL test requisitions and drinking water testing supplies are available on the shelf across from the table. **If your sample is too large to fit in a locker or if you have a question regarding testing, use the phone located on the table to call 601-576-7582 for assistance.**

Appendix T

MPHL Surveillance and Reportable Disease Submission Requests

The following bacterial isolates or patient specimens of public health importance should be sent to the Mississippi Public Health Laboratory (MPHL) for confirmation or additional testing.

Isolates of Public Health Significance
Bacillus anthracis
Borrelia burgdorferi
Brucella species
Burkholderia mallei
Burkholderia pseudomallei
Carbapenem-resistant Enterobacteriaceae (CRE), Pseudomonas aeruginosa (CRPA) and Acinetobacter baumannii (CRAB)
Clostridum botulinum
Corynebacterium diphtheriae
Coxiella burnetii
Escherichia coli O157:H7 and any shiga toxin-producing E. coli (STEC)
Francisella tularensis
Grimontia hollisae
Haemophilus influenzae obtained from normally sterile sites
Listeria monocytogenes
Mycobacterium tuberculosis
Neisseria meningitidis obtained from normally sterile sites
Photobacterium damselae
Salmonella species, not S. typhi

Salmonella typhi
Shigella species
Staphylococcus aureus, vancomycin resistant or vancomycin intermediate
Streptococcus pneumoniae obtained from normally sterile sites in patients ≤ 15 years of age
Vibrio cholerae
Vibrio species
Yersinia pestis
Candida auris

Clinical Specimens of Public Health Interest
Any parasite identified in CSF
Any Plasmodium species
Any specimen that was culture-independent diagnostic test (CIDT) POSITIVE the following: • *Escherichia coli* O157:H7 and any shiga toxin-producing *E. coli* (STEC); • *Salmonella* species; • *Shigella* species; • *Vibrio* species; • *Listeria monocytogenes*; • *Neisseria meningitidis*; • *Haemophilus influenzae*; • Carbapenem-resistant *Enterobacterales* (CRE); • Carbapenem-resistant *Pseudomonas aeruginosa* (CRPA); • Carbapenem-resistant *Acinetobacter baumannii* (CRAB); • Vancomycin-resistant *Staphylococcus aureus*; • *Streptococcus pneumoniae* from a normally sterile site in patients ≤ 15 years of age; OR • *Mycobacterium tuberculosis complex*

Specimens should be submitted to the Mississippi Public Health Laboratory (MPHL) by:

- Dropping off specimens packaged in accordance with all Department of Transportation (DOT) regulations at a local MSDH clinic Monday- Friday for overnight delivery to the MPHL. Please contact your local MSDH clinic prior to dropping off a specimen to confirm the clinic's hours of operation; OR

- Dropping off specimens packaged in accordance with all Department of Transportation (DOT) regulations directly at the MPHL, Monday-Sunday, 8am-4:30 pm

Please refer to the specific organism information for the specimen submission requirements.