

# Ebola Virus

Guidance for Michigan local health departments  
and healthcare providers

## Interim Guidelines for Evaluation of US Patients Suspected of Having Ebola Virus Disease (EVD)

*This is a rapidly evolving situation. This document is based on the Centers for Disease Control and Prevention's (CDC) current guidance for the identification, evaluation, treatment, and monitoring of people potentially exposed to Ebola, as of December 2, 2014. We anticipate that CDC will continue to update their Ebola guidance and thus advise monitoring their website at: <http://www.cdc.gov/vhf/ebola/index.html>*

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### Information and contacts

*All suspect cases should be immediately reported to MDCH for evaluation **and/or approval for diagnostic testing**: Contact the Communicable Disease Division at 517-335-8165 M-F, 8 AM-5 PM, 517-335-9030 after hours and weekends.*

For laboratory information: Contact Janice Matthews-Greer in the MDCH Virology Section at (517) 335-8099.

Michigan Department of Community Health  
Communicable Disease Division

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Adapted from CDC Guidance as of 12/18/2014



## Background

The 2014 Ebola outbreak is the first to occur in West Africa and the largest known to date. A [current list](#) of the countries with widespread Ebola transmission, as well as the most current guidance can be found on the CDC's Ebola website at <http://www.cdc.gov/vhf/ebola/index.html>. To date, two imported cases, including one death, and two locally acquired cases in healthcare workers have been [reported in the United States](#).

EVD is characterized by sudden onset of fever and malaise, accompanied by one or more of the following:

- muscle pain
- severe headache
- weakness
- abdominal pain
- vomiting
- diarrhea

Patients may progress to develop more severe signs or symptoms including hemorrhagic symptoms (bleeding, bruising) and multi-organ dysfunction, including hepatic damage, acute kidney disease, and central nervous system involvement, leading to shock and death. See the case definition for Ebola Virus Disease at:

<http://www.cdc.gov/vhf/ebola/hcp/case-definition.html>

In outbreak settings, Ebola virus is typically first spread to humans after contact with infected wildlife and is then spread person-to-person through direct contact with bodily fluids such as, but not limited to, blood, urine, sweat, semen, and breast milk. The incubation period is usually 8–10 days (ranges from 2–21 days). Patients can transmit the virus while febrile and through later stages of disease, as well as postmortem, when persons touch the body during funeral preparations.

## Case Evaluation Criteria

CDC Case definition: <http://www.cdc.gov/vhf/ebola/hcp/case-definition.html>

Ebola virus Disease (EVD) is a rare and deadly viral illness which is [reportable](#) to the Michigan Disease Surveillance System (MDSS). Early recognition of Ebola is critical for infection control. Healthcare providers should be alert for and evaluate patients suspected of having Ebola.

## Person Under Investigation (PUI)

A person who has both consistent signs or symptoms and risk factors as follows:

1. Elevated body temperature or subjective fever or symptoms, including severe headache, fatigue, muscle pain, vomiting, diarrhea, abdominal pain, or unexplained hemorrhage;

**AND**

2. An [epidemiologic risk](#) factor within the 21 days before the onset of symptoms.

## Confirmed Case

A PUI with laboratory confirmed diagnostic evidence of Ebola virus infection.

Early recognition is critical to controlling the spread of Ebola virus. Healthcare providers should evaluate the patient's [epidemiologic risk](#), including a history of travel to a [country with widespread Ebola virus transmission](#) or contact within the preceding 21 days with a person with Ebola while the person was symptomatic. Click [HERE](#) for an evaluation algorithm to determine if testing for Ebola is indicated.

If a diagnosis of Ebola is being considered, the patient should be isolated in a single room (with a private bathroom), and healthcare personnel should follow [standard, contact, and droplet precautions](#), including the use of [appropriate personal protective equipment \(PPE\)](#). Infection control personnel should be contacted immediately.

If Ebola is suspected, MDCH should be immediately contacted (517-335-8165 weekday, daytime; 517-335-9030 evenings and weekends) for consultation and to assess whether testing is indicated and the need for initiating identification of contacts.

## Emergency Department (ED) Evaluation and Management for Patients Who Present with Possible Ebola Virus Disease

In general, the majority of febrile patients presenting to the ED do not have EVD and the risk posed by patients with early, limited symptoms is lower than that from a patient hospitalized with severe EVD. However, because early symptoms of EVD are similar to other febrile illnesses, the triage and evaluation processes in the ED should systematically assess patients for the possibility of EVD. See "[When Caring for Suspect or Confirmed Patients with Ebola](#)" for a check list of steps hospitals can take to prepare to manage a PUI for Ebola. EDs may want to print and post this [algorithm](#) that describes the steps of an evaluation of a suspect EVD patient.

Early recognition and identification of suspect EVD patients is critical.

### Think Ebola if:

- The patient has a travel history of Liberia, Sierra Leone, or Guinea
- The patient has a history of exposure to a person with Ebola

If a patient is identified to have suspected or confirmed EVD, healthcare teams should follow standard, contact, and droplet precautions, including the following:

- Isolate the patient in a single room (containing a private bathroom) with the door closed.
- Only essential healthcare workers with designated roles should provide patient care. All healthcare workers who have contact with the patient should put on appropriate PPE based on the patient's clinical status, as outlined in [CDC's PPE guidance](#).
- Notify the Hospital Infection Control Program and other appropriate staff.
- Once appropriate PPE has been put on, continue obtaining additional history and performing physical examination and routine diagnostics and interventions which may include placement of peripheral IV and phlebotomy.
- Malaria diagnostics should also be a part of initial testing because it is a common cause of febrile illness in persons with a travel history to the affected countries.

Refer to the CDC's "[Infection Prevention and Control Recommendations for Hospitalized Patients with Known or Suspected Ebola Hemorrhagic Fever in U.S. Hospitals](#)" for complete details. Information regarding initial evaluation, clinical presentation and clinical course, pathogenesis, laboratory findings, and treatment for patients suspected of EVD can be found in "[Ebola Virus Disease Information for Clinicians in U.S. Healthcare Settings](#)." Additional information for Healthcare Workers and Settings is available at: <http://www.cdc.gov/vhf/ebola/hcp/index.html>.

**Contact MDCH for consultation regarding patients under investigation and EVD testing approval. In the event that testing is approved, MDCH will immediately notify local public health officials.**

### **Patient Does Not Qualify as a [PUI](#)**

A patient who does not qualify as a person under investigation (PUI) for EVD should be treated as any other patient who presents to the healthcare facility for a potentially infectious disease according to hospital protocols.

### **[Considerations for Discharging a PUI for Ebola Virus Disease](#)**

The decision to discharge a patient being evaluated as a PUI for Ebola who has not had a negative [RT-PCR test](#) (testing not performed, or testing on sample collected less than 72 hours after onset of symptoms is negative) for Ebola should be based on clinical and laboratory criteria and on the ability to monitor the PUI after discharge, and made by the medical providers caring for the PUI, along with public health officials. The following criteria should be considered:

- Clinical judgment of the medical team is that the PUI's symptoms are not consistent with Ebola.
- The PUI is afebrile off antipyretics for 24 hours, or there is an alternate explanation for fever.
- Symptoms compatible with Ebola have resolved or are accounted for by an alternative diagnosis.
- The PUI has no clinical laboratory results consistent with Ebola, or those that could be consistent have been otherwise explained.
- The PUI will continue to be actively monitored by public health as described for an asymptomatic person per the appropriate risk category recommendations (See Monitoring of Potential Ebola Virus Exposures).

## Monitoring of Potential Ebola Virus Exposures

Monitoring of asymptomatic travelers and contacts of known EVD case patients is guided by the risk level of exposure. Based on the criteria outlined below and in CDC's "[Interim U.S. Guidance for Monitoring and Movement of Persons with Potential Ebola Virus Exposure](#)", notify MDCH immediately. MDCH will immediately notify local public health if additional monitoring is warranted. See the [MDCH Traveler Evaluation and Monitoring \(TEAM\) protocol](#) for details on Michigan's traveler monitoring recommendations.

### High risk –direct contact of Ebola-infected body fluids through:

- Needle stick, or splashes to eyes, nose, or mouth
- Getting body fluids directly on skin
- Handling body fluids, such as in a laboratory, without wearing personal protective equipment (PPE) or following recommended safety precautions
- Touching a dead body without correctly wearing PPE in a country with widespread Ebola transmission (in countries with widespread Ebola transmission, it is not always known what a person died of. Therefore, touching any dead body in one of these countries is considered a high risk exposure.)
- Living with and caring for a person showing symptoms of Ebola

### Some risk:

- Close contact with a person showing symptoms of Ebola such as in a household, healthcare facility, or the community. Close contact means being within 3 feet of the person with Ebola for a long time without wearing PPE.
- In countries with widespread Ebola transmission, persons who had direct contact while using appropriate PPE with a person with Ebola while the person was symptomatic.

### Low risk (but not zero):

- Having been in a country with widespread Ebola transmission within the previous 21 days and having no known exposure
- Being in the same room for a brief period of time (without direct contact) with a person showing symptoms of Ebola
- Having brief skin contact with a person showing symptoms of Ebola when the person was believed to not be very contagious
- In countries without widespread Ebola transmission: having direct contact with a person showing symptoms of Ebola while wearing PPE
- Travel on an airplane with a person showing symptoms of Ebola

### No risk:

- Contact with a person who is NOT showing symptoms and had contact with a person with Ebola
- Contact with a person with Ebola BEFORE the person was showing symptoms
- Having traveled to a country with Ebola outbreak MORE than 21 days ago
- Having been in a country where there is no widespread Ebola transmission (e.g., the United States), and having no other exposures to Ebola

Symptomatic *High, Some and Low risk* categories MUST have a medical examination to make sure they don't have Ebola. *No risk* category people might need to have a medical evaluation for other diseases (not Ebola).

## Recommended Public Health actions for [people without symptoms](#)

RISK LEVEL	PUBLIC HEALTH ACTION		
	Monitoring	Restricted Public Activities	Restricted Travel
<b>HIGH risk</b>	Yes-Direct Active	Yes	Yes
<b>SOME risk</b>	Yes-Direct Active	Case-by-case assessment	Case-by-case assessment
<b>LOW risk</b>	Yes-Active or Direct Active	No	No
<b>NO risk</b>	No	No	No

### Action Definitions

Public health actions, such as isolation of symptomatic people, active monitoring or direct active monitoring of people without symptoms, and travel restrictions when needed, help protect the public by preventing the spread of disease.

- **Isolation** separates sick people who are confirmed to have a contagious disease from people who are not sick.
- **Active monitoring** means that public health officials are responsible for checking at least once a day to see if people have a fever or other symptoms of Ebola. People being monitored must take their temperature twice daily, watch themselves for symptoms, report as directed to public health officials, and immediately tell public health officials if they have a fever or other symptoms. Active monitoring must take place until 21 days after the last possible exposure and can occur on a voluntary basis or be required by public health order.
- **Direct active monitoring** means that public health officials conduct active monitoring by directly observing the person being monitored. This means that a public health official directly observes the individual at least once a day to review symptoms and check temperature; a second follow-up per day can be done by telephone instead of being directly observed. Direct active monitoring should include discussion of plans to work, travel, take public transportation, or go to busy public places to determine whether these activities are allowed.
- **Restricted public activities** determined and enforced as necessary by public health authorities may include controlled movement, exclusion from public places and congregate gatherings, and exclusion from the workplace for the duration of the monitoring period.
- **Travel restrictions** means that people must NOT travel by airplane, ship, or long-distance bus or train, even if they are NOT sick. The reason for this is to prevent possible spread of Ebola if the person develops fever or other symptoms during travel. People on travel restrictions might be allowed to travel by private plane or car as long as they continue to be monitored during travel. Taking local public transportation should be discussed with the local health department.

### Guidance for monitoring healthcare workers, both in U.S. and abroad

- Healthcare workers returning from caring for Ebola patients while wearing appropriate PPE in the countries currently experiencing an outbreak of EVD fall into the “Some risk” category that requires additional precautions and public health monitoring upon their return.
- Healthcare workers caring for Ebola patients while wearing appropriate PPE in the U.S. are considered at “Low risk”, and thus must have direct active monitoring following their exposure to an Ebola patient. If a U.S. healthcare worker becomes sick after caring for an Ebola patient and the exposure is not clear, all healthcare workers in that hospital that cared for the Ebola patient will move into the “High risk” category, the hospital’s infection control practices will be reviewed and improved, and workers retrained.

## Laboratory Specimen Guidance

### Preferred Specimens for Ebola Testing

If a hospital has identified a PUI for EVD, **immediately notify MDCH** (at 517-335-8165 Monday through Friday from 8 AM to 5 PM, or at 517-335-9030 after hours and weekends). Testing at MDCH BOL is available 7 days a week. **Contact MDCH BOL before any specimens are collected and submitted.** Two tubes, each with a minimum of 4mL whole blood preserved with EDTA (purple top) in **plastic** collection tubes must be collected and submitted to MDCH BOL for EVD testing. Do not submit specimens in glass containers. Specimens should be stored at 4°C. Standard labeling should be applied for each specimen.

### Laboratory Specimen Collection

Early recognition and identification of suspect EVD patients is critical. Additional patient care considerations include:

- Limit the use of needles and other sharps as much as possible.
- Phlebotomy, procedures, and laboratory testing should be limited to the minimum necessary for essential diagnostic evaluation and medical care.
- All needles and sharps should be handled with extreme care and disposed in puncture-proof, sealed containers.
- Do not use a pneumatic tube system for transporting suspected EVD specimens.

### Laboratory Testing

- MDCH BOL is performing analysis for EVD on specimens approved for testing.
- Testing at MDCH BOL is available 7 days a week
- Negative and presumptive positive test results are available within 24 hours of specimen receipt at MDCH BOL.
- Confirmation of positive test results are performed by CDC - allow at least an additional 24-48 hours for test results.

### Packaging and Shipping Clinical Specimens to MDCH BOL

***Please complete both the MDCH Specimen and CDC Submission Forms.***

All specimens should be packaged and shipped to MDCH BOL on ice packs as Category A Infectious Substance in accordance with federal and international shipping regulations. MDCH will forward specimens to the CDC.

Link to MDCH Specimen Submission Form:

[http://www.michigan.gov/documents/DCH-0583TEST\\_REQUEST\\_7587\\_7.pdf](http://www.michigan.gov/documents/DCH-0583TEST_REQUEST_7587_7.pdf)

(Be sure to write or type the test requested, i.e. "Ebola virus serology" and/or "Ebola virus PCR" into the blank space found under "Hepatitis" at the bottom right side of page 1.)

Link to CDC Specimen Submission Form:

[http://www.michigan.gov/documents/mdch/HUMAN\\_form-50-34\\_410210\\_7.pdf](http://www.michigan.gov/documents/mdch/HUMAN_form-50-34_410210_7.pdf)

For additional information, please refer to the "What's New" section on the MDCH BOL home page:

<http://www.michigan.gov/mdchlab>

Additional information regarding specimen submission can be found in CDC's document "[Interim Guidance for Specimen Collection, Transport, Testing, and Submission for Patients with Suspected Infection with Ebola Virus Disease.](#)"

## Recommended Infection Control Measures for Healthcare Providers

U.S. hospitals can safely manage a patient with EVD by following recommended isolation and infection control procedures, including standard, contact, and droplet precautions. Early recognition and identification of patients with potential EVD is critical. Any U.S. hospital with suspected patients should follow CDC's [Infection Prevention and Control Recommendations for Hospitalized Patients with Known or Suspected Ebola Hemorrhagic Fever in U.S. Hospitals](#). These recommendations include the following:

- **Patient placement:** Patients should be placed in a single patient isolation room (containing a private bathroom) with the door closed.
- **Personal Protective Equipment (PPE):** CDC has updated their PPE recommendations as of 10/20/14. Very specific and detailed guidance for PPE needed for the care of **hospitalized Ebola virus disease patients** is available at <http://www.cdc.gov/vhf/ebola/hcp/procedures-for-ppe.html>. The guidance in this document reflects lessons learned from the recent experiences of U.S. hospitals caring for Ebola patients and emphasizes the importance of **training, practice, competence, and observation** of healthcare workers in correct donning and doffing of PPE selected by the facility.
- **Aerosol-generating procedures:** Avoid aerosol-generating procedures. If performing these procedures, the procedure should ideally be performed in an airborne isolation room with the minimum necessary number of personnel and no visitors present.

## Environmental Infection Control

Diligent environmental cleaning and disinfection and safe handling of potentially contaminated materials is paramount, as blood, sweat, emesis, feces and other body secretions represent potentially infectious materials. Appropriate disinfectants for Ebola virus and other filoviruses include 10% sodium hypochlorite (bleach) solution, or hospital-grade quaternary ammonium or phenolic products. Healthcare providers performing environmental cleaning and disinfection should wear recommended PPE (described above). Refer to CDC's "[Interim Guidance for Environmental Infection Control in Hospitals for Ebola Virus](#)", for specific recommendations on environmental cleaning and/or disinfection.

## Medical Waste Management

Medical waste generated in the care of patients with known or suspected EVD is subject to procedures set forth by local, state, and federal regulations. The Ebola virus is classified as a Category A infectious substance by and regulated by the U.S. Department of Transportation's (DOT) Hazardous Materials Regulations (HMR, 49 C.F.R., Parts 171-180). Any item transported offsite for disposal that is contaminated or suspected of being contaminated with a Category A infectious substance must be packaged and transported in accordance with the HMR. Ebola-associated waste that has been properly inactivated or incinerated is no longer infectious.

For the most complete and current information regarding Ebola-associated medical waste, see the Centers for Disease Control document "[Ebola Medical Waste Management](#)."

## Procedures for Handling EVD Suspect Human Remains

If the patient dies, handling of the body should be minimized. The remains should not be embalmed. Remains should be wrapped in sealed leak-proof material and cremated or buried promptly in a sealed casket. If an autopsy is necessary, the MDCH and CDC should be consulted regarding appropriate precautions. For specific guidance see the CDC document "[Guidance for Safe Handling of Human Remains of Ebola Patients in U.S. Hospitals and Mortuaries](#)."

## Additional Resources

Interim Guidance: EMS Systems and 9-1-1 PSAPs: Management of Patients in the U.S.  
<http://www.cdc.gov/vhf/ebola/hcp/interim-guidance-emergency-medical-services-systems-911-public-safety-answering-points-management-patients-known-suspected-united-states.html>

Guidance on Air Medical Transport for Patients with Ebola Virus Disease  
<http://www.cdc.gov/vhf/ebola/hcp/guidance-air-medical-transport-patients.html>

### Ebola Hemorrhagic Fever Fact Sheet:

For healthcare providers and local public health: <http://www.cdc.gov/vhf/ebola/pdf/ebola-factsheet.pdf>

For the public and community organizations: <http://www.cdc.gov/vhf/ebola/pdf/what-need-to-know-ebola.pdf>

### Information for Travelers

For information regarding travel to and from West Africa, see the [Centers for Disease Control Ebola Travelers' Health Page](#).

For People Working and Living Abroad please see the CDC guidance at <http://www.cdc.gov/vhf/abroad/working-living-abroad.html>

### Information for Airlines

Information related to Ebola virus and the air travel industry is available at the [Centers for Disease Control Travelers' Health Travel Industry Information Center](#).

Please also see the CDC's updated "Interim Guidance about Ebola Virus Infection for Airline Flight Crews, Cleaning Personnel, and Cargo Personnel" at <http://www.cdc.gov/quarantine/air/managing-sick-travelers/ebola-guidance-airlines.html>

### List of Questions and Answers on Ebola:

<http://www.cdc.gov/vhf/ebola/qa.html>

**Ebola Viral Disease Person Under Investigation (PUI) Form**

State/Local ID:

CDC ID:

**I. Patient Information**

Date of form completed : MM / DD / YYYY

Date PUI identified: MM / DD / YYYY

**Form Administrator**

Name (Last, First): \_\_\_\_\_ Affiliation: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ County: \_\_\_\_\_  
 Phone number: \_\_\_\_\_ Email address: \_\_\_\_\_

**Patient Information**

Patient Name (Last, First): \_\_\_\_\_ Sex:  Male  Female  
 Date of birth: MM / DD / YYYY Age Group:  Adult  Pediatric (< 18 years) Age: \_\_\_\_\_  
 Citizenship: \_\_\_\_\_ Country of Residence:  U.S.  Other (specify): \_\_\_\_\_  
 Number of household contacts: \_\_\_\_\_

**Patient Hospitalization** Is the patient currently admitted to a hospital?  Yes  No Date of admission: MM / DD / YY

Facility Name: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_  
 Physician Name (Last, First): \_\_\_\_\_ Contact Information: \_\_\_\_\_  
 Is the patient being treated under isolation precautions?  Yes  No Date of isolation: MM / DD / YY  
 Was the patient transferred from a previous health care facility?  Yes  No  
 Facility Name: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_

**II. Medical History and Symptom Onset**

**III. Epidemiologic Risk Factors**

Medical History:

1. Have you had contact with a suspect/known case of Ebola in the 3 weeks before becoming ill?  
 Yes  No  Unknown  
 If yes, name: \_\_\_\_\_  
 State/Local ID: \_\_\_\_\_ CDC ID: \_\_\_\_\_

If yes, please describe:

Have you experienced any of the following symptoms?	If yes, date symptom began ( / / )
<input type="checkbox"/> Fatigue	
<input type="checkbox"/> Fever/Feverish Temp: _____	
<input type="checkbox"/> Headache	
<input type="checkbox"/> Stomach pain	
<input type="checkbox"/> Muscle pain	
<input type="checkbox"/> Diarrhea	
<input type="checkbox"/> Unexplained bruising/bleeding	
<input type="checkbox"/> Vomiting	
<input type="checkbox"/> Other:	

2. Did you traveled outside of the United States in the 3 weeks before becoming ill?  Yes  No  
 Country (1) : \_\_\_\_\_  
 MM / DD / YYYY to MM / DD / YYYY  
 Country (2) : \_\_\_\_\_  
 MM / DD / YYYY to MM / DD / YYYY

Did you provide health care for any known/ suspect cases of Ebola?  Yes  No

If yes, please describe:

**Ebola Viral Disease Person Under Investigation (PUI) Form**

State/Local ID:

CDC ID:

**IV. Laboratory Testing**

**Test 1**

Originating Facility: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_

Point of Contact: \_\_\_\_\_

Phone Number: \_\_\_\_\_ E-mail: \_\_\_\_\_

Where was testing performed?  LRN: \_\_\_\_\_  CDC

Specimen ID: \_\_\_\_\_

Test Performed (PCR, BioFire Defense FilmArray): \_\_\_\_\_ Test Date: MM / DD / YYYY

Result:  Positive  Negative  Inconclusive Result Date: MM / DD / YYYY

**Test 2**

Originating Facility: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_

Point of Contact: \_\_\_\_\_

Phone Number: \_\_\_\_\_ E-mail: \_\_\_\_\_

Where was testing performed?  LRN: \_\_\_\_\_  CDC

Specimen ID: \_\_\_\_\_

Test Performed (PCR, BioFire Defense FilmArray): \_\_\_\_\_ Test Date: MM / DD / YYYY

Result:  Positive  Negative  Inconclusive Result Date: MM / DD / YYYY

**Test 3**

Originating Facility: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_

Point of Contact: \_\_\_\_\_

Phone Number: \_\_\_\_\_ E-mail: \_\_\_\_\_

Where was testing performed?  LRN: \_\_\_\_\_  CDC

Specimen ID: \_\_\_\_\_

Test Performed (PCR, BioFire Defense FilmArray): \_\_\_\_\_ Test Date: MM / DD / YYYY

Result:  Positive  Negative  Inconclusive Result Date: MM / DD / YYYY

**Test 4**

Originating Facility: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_

Point of Contact: \_\_\_\_\_

Phone Number: \_\_\_\_\_ E-mail: \_\_\_\_\_

Where was testing performed?  LRN: \_\_\_\_\_  CDC

Specimen ID: \_\_\_\_\_

Test Performed (PCR, BioFire Defense FilmArray): \_\_\_\_\_ Test Date: MM / DD / YYYY

Result:  Positive  Negative  Inconclusive Result Date: MM / DD / YYYY