

EBOLA VIRUS DISEASE (EVD)

REPORTING INFORMATION

- **Class A:** *Report immediately via telephone* the case or suspected case and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report immediately via telephone to the local public health department in which the reporting health care provider or laboratory is located. Local health departments should report immediately via telephone the case or suspected case and/or a positive laboratory result to the Ohio Department of Health (ODH).
- Reporting Form(s) and/or Mechanism:
 - *Immediately via telephone.*
 - For local health departments, cases should also be entered into the Ohio Disease Reporting System (ODRS) within 24 hours of the initial telephone report to the ODH.
 - The [CDC Ebola Virus Disease \(EVD\) Consultation Form](#) is available for use.
- Key fields for ODRS reporting include: import status (whether the infection was travel-associated or Ohio-acquired), date of illness onset, and all the fields in the Epidemiology module.

AGENTS AND DISEASES

Viral hemorrhagic fevers (VHFs) refer to a group of illnesses that are caused by several distinct families of viruses. In general, the term "viral hemorrhagic fever" is used to describe a severe multi-organ system syndrome. The three most common VHFs are Ebola Virus Disease, Lassa fever and Marburg hemorrhagic fever.

Ebola hemorrhagic fever is a severe, often-fatal disease in humans and nonhuman primates (monkeys, gorillas, and chimpanzees) that has appeared sporadically since its initial recognition in 1976. The disease is caused by infection with Ebola virus, named after a river in the Democratic Republic of the Congo (formerly Zaire) in Africa, where it was first recognized. The virus is one of two members of a family of RNA viruses called the Filoviridae. A major outbreak of > 2,000 cases occurred in West Africa in 2014. Five countries were involved: Guinea, Liberia, Nigeria, Sierra Leone.

CASE DEFINITION

The case definition below is the standard CDC case definition for VHF.

Clinical Description

An illness with acute onset with ALL of the following clinical findings:

- A fever > 100.4F (38.0°C) (CDC 2014 case definition)
- One of more of the following clinical findings:
 - Severe headache
 - Muscle pain
 - Erythematous maculopapular rash on the trunk with fine desquamation 3-4 days after rash onset
 - Vomiting
 - Diarrhea
 - Pharyngitis (arenavirus only)
 - Abdominal pain
 - Bleeding not related to injury
 - Retrosternal chest pain (arenavirus only)
 - Proteinuria (arenavirus only)
 - Thrombocytopenia

Laboratory Criteria for Diagnosis

One or more of the following laboratory findings:

- Detection of VHF viral antigens in blood by enzyme-linked Immunosorbent Assay (ELISA) antigen detection
- VHF viral isolation in cell culture for blood or tissues
- Detection of VHF-specific genetic sequence by Reverse Transcription-Polymerase Chain Reaction (RT-PCR) from blood or tissues
- Detection of VHF viral antigens in tissues by immunohistochemistry

Criteria for Epidemiologic Linkage

One or more of the following exposures within the 3 weeks before onset of symptoms:

- Contact with blood or other body fluids of a patient with VHF
- Residence in or travel to a VHF endemic area
- Work in a laboratory that handles VHF specimens
- Work in a laboratory that handles bats, rodents, or primates from endemic areas
- Exposure to semen from a confirmed acute or convalescent case of VHF within 10 weeks of that person's onset of symptoms

Case Classification

Suspect: Case meets the clinical and epidemiologic linkage criteria.

Confirmed: Case meets the clinical and laboratory criteria.

SIGNS AND SYMPTOMS

Ebola hemorrhagic fever symptoms include abrupt onset of fever, headache, joint and muscle aches, sore throat, and weakness, followed by diarrhea, vomiting, and stomach pain. A rash, red eyes, hiccups and internal and external bleeding may be seen in some patients.

DIAGNOSIS

Ebola hemorrhagic fever is diagnosed through virus isolation, antigen-capture enzyme-linked immunosorbent assay (ELISA) testing, IgM ELISA and polymerase chain reaction (PCR). Virus isolation can be used to diagnose a case of *Ebola HF* within a few days of the onset of symptoms. Persons tested later in the course of the disease or after recovery can be tested for IgM and IgG antibodies. The disease can also be diagnosed retrospectively in deceased patients by using immunohistochemistry testing, virus isolation, or PCR.

Do not attempt to culture any specimens. The Special Pathogens Branch at CDC works with Biosafety Level 4 (BSL-4) viruses. These viruses are highly pathogenic and require handling in special laboratory facilities designed to contain them. The hospital should be instructed to hold on to any blood, serum, CSF, respiratory secretions and other tissue collected. The local health department and ODH will coordinate the shipment of all laboratory specimens for testing. ODH Outbreak Response and Bioterrorism Investigation Team (614) 995-5599 will follow up on the laboratory specimens.

EPIDEMIOLOGY

Occurrence

VHF viruses are distributed throughout the world. Each virus is associated with one or more nonhuman hosts, restricting natural occurrence of VHF to the areas inhabited by these species. Viruses causing hemorrhagic fevers are initially transmitted to humans when the habitats of the infected reservoir hosts and humans overlap. Risk of VHF is associated with human incursion into such areas. In general, humans are incidental ("dead-end") hosts for these enzootic diseases. Cases and outbreaks of EVD have been recognized across Africa since 1976.

Mode of Transmission and Source

People can be exposed to Ebola virus from direct contact with the blood and/or secretions, organs or semen of an infected person. Thus, the virus is often spread through families and friends because they come in close contact with such secretions when caring for infected persons. People can also be exposed to Ebola virus through contact with objects, such as needles, that have been contaminated with infected secretions. Ebola can also be acquired while handling infected dead mammals in Africa, or through contact with the blood or organs of infected cynomolgus monkeys. Nosocomial transmission is common in African healthcare facilities through the previously stated contact means.

Incubation Period

Ebola hemorrhagic fever: 2-21 days

PUBLIC HEALTH MANAGEMENT

Case

Investigation

Obtain information about the patient's occupation, history of travel outside the United States, contact with wild animals or lab animals, contact with a suspected or confirmed case of viral hemorrhagic fever, or close contact with an ill individual who traveled to a viral hemorrhagic fever-endemic area.

Treatment

There is no standard treatment for Ebola hemorrhagic fever. Patients receive supportive therapy. This consists of balancing the patient's fluids and electrolytes, maintaining oxygen status and blood pressure, and treating for any complicating infections.

Isolation

Ohio Administrative Code (OAC) 3701-3-13 (DD) states:

"Viral hemorrhagic fever (VHF): a person with confirmed or suspected viral hemorrhagic fever shall be placed in airborne isolation until no longer considered infectious."

Clinicians evaluating suspect cases should use standard (e.g. hand hygiene), airborne (e.g. N-95 respirator) and contact (e.g. gowns and gloves) precautions.

Contacts

Investigation

Currently there is no post-exposure prophylaxis available for individuals exposed to these agents. Investigation of contacts and source of infection: Identify all close contacts in the three weeks after the onset of illness. Initiate quarantine and active surveillance of contacts by having contacts take and maintain record of body temperature twice a day for 3 weeks after last exposure. If temperature is greater than 100.4°F (38.0°C), hospitalize patient immediately and initiate appropriate isolation precautions.

When a suspect case is reported, the local health department needs to start identifying close contacts. Often this starts with the family. The emergency room chart or the medical record may provide names of emergency contacts or family members.

The local health department needs to identify all persons who had "close contact" with the patient for the 21 days prior to the onset of the patient's illness, and thereafter until the patient is released from isolation.

Consult the CDC website for the latest information about Ebola virus disease:

<http://www.cdc.gov/ebola>

The 2014 Ebola outbreak is the largest Ebola outbreak in history and the first in West Africa. The current outbreak is affecting three countries in West Africa: Guinea, Liberia, and Sierra Leone. Twenty cases in Nigeria were associated with a man from Liberia who traveled to Lagos and died from Ebola, but the virus does not appear to have been widely spread. One case was diagnosed in Senegal in a person who traveled there from Guinea. The first case was recently diagnosed in the United States, in a patient who had traveled from Liberia to Texas.

CDC is working with other U.S. government agencies, the World Health Organization, and other domestic and international partners and has activated its Emergency Operations Center to help coordinate technical assistance and control activities with partners. CDC has also deployed teams of public health experts to West Africa and continues to send public health experts to the affected countries.

What is Ebola?

Ebola, also known as Ebola virus disease, is a rare and deadly disease caused by infection with one of the Ebola virus strains (Zaire, Sudan, Bundibugyo, or Tai Forest virus). Ebola viruses are found in several African countries. Ebola was discovered in 1976 near the Ebola River in what is now the Democratic Republic of the Congo. Since then, outbreaks have appeared sporadically in several African countries.

What are the signs and symptoms of Ebola?

Signs and symptoms of Ebola include fever (greater than 38.0°C or 100.4°F) and severe headache, muscle pain, vomiting, diarrhea, stomach pain, or unexplained bleeding or bruising. Signs and symptoms may appear anywhere from 2 to 21 days after exposure to Ebola, although 8 to 10 days is most common.

How is Ebola spread?

The virus is spread through **direct contact** (through broken skin or mucous membranes) with blood and body fluids (urine, feces, saliva, vomit, and semen) of a person who is sick with Ebola, or with objects (like needles) that have been contaminated with the virus. Ebola is not spread through the air or by water or, in general, by food; however, in Africa, Ebola may be spread as a result of handling bushmeat (wild animals hunted for food) and contact with infected bats.

Who is most at risk of getting Ebola?

Healthcare providers caring for Ebola patients and family and friends in close contact with Ebola patients are at the highest risk of getting sick because they may come in direct contact with the blood or body fluids of sick patients.

In some places affected by the current outbreak, care may be provided in clinics with limited resources (for example, no running water, no climate control, no floors, inadequate medical supplies), and workers could be in those areas for several hours with a number of Ebola infected patients. Additionally, certain job responsibilities and tasks, such as attending to dead bodies, may also require different PPE than what is used when providing care for infected patients in a hospital.

Can I get Ebola from a person who is infected but doesn't have fever or any symptoms?

No. A person infected with Ebola is not contagious until symptoms appear.

If someone survives Ebola, can he or she still spread the virus?

Once someone recovers from Ebola, they can no longer spread the virus. However, Ebola virus has been found in semen for up to 3 months. People who recover from Ebola are advised to abstain from sex or use condoms for 3 months.

Can Ebola be spread through mosquitos?

There is no evidence that mosquitos or other insects can transmit Ebola virus. Only mammals (for example, humans, bats, monkeys and apes) have shown the ability to spread and become infected with Ebola virus.

Could Ebola be brought to the U.S. through imported animals?

Because of the tough restrictions the U.S. federal government has in place for importing animals from Africa, it is highly unlikely for Ebola to be brought into the U.S. through imported animals.

The animals most commonly associated with Ebola are nonhuman primates (for example, apes and monkeys) and bats. Both the CDC and the U.S. Fish and Wildlife Service regulate importation of nonhuman primates and bats. These animals, products made from these animals, and research samples from these animals may only be imported into the United States with a permit. The permit specifies that the animals, animal products, or research samples are arriving ONLY for scientific, educational, or exhibition purposes. It is illegal to import these animals into the United States as pets or bushmeat.

How is Ebola treated?

No specific vaccine or medicine has been proven to cure Ebola. Signs and symptoms of Ebola are treated as they appear. The following basic interventions, when used early, can increase the chances of survival.

- Providing fluids and electrolytes
- Maintaining oxygen status and blood pressure
- Treating other infections if they occur

Early recognition of Ebola is important for providing appropriate patient care and preventing the spread of infection. Healthcare providers should be alert for and evaluate any patients suspected of having Ebola.

How do I protect myself against Ebola?

If you are in or traveling to an area affected by the Ebola outbreak, protect yourself by doing the following:

- Wash hands frequently.
- Avoid contact with blood and body fluids of any person, particularly someone who is sick.
- Do not handle items that may have come in contact with an infected person's blood or body fluids.
- Do not touch the body of someone who has died from Ebola.
- Do not touch bats and nonhuman primates or their blood and fluids and do not touch or eat raw meat prepared from these animals.
- Avoid hospitals where Ebola patients are being treated. The U.S. Embassy or consulate is often able to provide advice on medical facilities.
- Seek medical care immediately if you develop fever (temperature of 100.4°F/ 38.0°C) and any of the other following symptoms: headache, muscle pain, diarrhea, vomiting, stomach pain, or unexplained bruising or bleeding.
- Limit your contact with other people until and when you go to the doctor. Do not travel anywhere else besides a healthcare facility.

CDC has issued a Warning, Level 3 travel notice for three countries. U.S. citizens should avoid all nonessential travel to Guinea, Liberia, and Sierra Leone. CDC has issued an Alert, Level 1 travel notice for Nigeria. Travelers to Nigeria should practice usual precautions to prevent Ebola. For travel notices and other information for travelers, visit the [Travelers' Health Ebola](#) web page.

Can hospitals in the United States care for an Ebola patient?

Any U.S. hospital that is following CDC's [infection control recommendations](#) and can isolate a patient in their own room with a private bathroom is capable of safely managing a patient with Ebola.

- These patients need intensive supportive care; any hospital that has this capability can safely manage these patients.
- Standard, contact, and droplet precautions are recommended.

How can healthcare providers protect themselves?

Healthcare providers can take several infection control measures to protect themselves when dealing with Ebola patients.

- Anyone entering the patient's room should wear at least gloves, a gown, eye protection (goggles or a face shield), and a facemask.
- Additional personal protective equipment (PPE) might be needed in certain situations (for example, when there is a lot of blood, vomit, feces, or other body fluids).
- Healthcare providers should frequently perform hand hygiene before and after patient contact, contact with potentially infectious material, and before putting on and after removing PPE, including gloves.

What is being done to prevent ill travelers in West Africa from getting on a plane?

CDC works with partners at ports of entry into the United States to help prevent infectious diseases from being introduced and spread in the United States. CDC has staff working 24/7 at 20 Border Health field offices located in international airports and land borders. CDC staff are ready 24/7 to investigate cases of ill travelers on planes and ships entering the United States.

Although someone could become infected with Ebola in Guinea, Liberia, or Sierra Leone and then fly to the United States, it is unlikely that they would spread the disease to fellow passengers. A person infected with Ebola is not contagious until symptoms appear. Nevertheless, CDC and healthcare providers in the United States need to be prepared for the remote possibility that a traveler could get Ebola and return to the United States while sick.

CDC works with key partners like Customs and Border Protection, U.S. Department of Agriculture, U.S. Coast Guard, U.S. Fish and Wildlife Services, state and local health departments, and local Emergency Medical Services staff. CDC also works closely with the airline and cruise industries and cargo ships to ensure that suspected cases of infectious diseases are reported to CDC Quarantine Stations and that appropriate measures are taken to prevent the spread of disease. When CDC receives a report of an ill traveler on a plane, our staff work with EMS crews to evaluate the passenger on the plane, and when necessary, arrange for transfer of ill travelers to local hospitals for testing and treatment as necessary. When CDC receives a report of an ill traveler on cruise or cargo ship, we work with the shipping line to make an assessment of public health risk and to coordinate any necessary response.

CDC is providing information to partners, such as Customs and Border Protection and airlines, on signs and symptoms to look for in travelers arriving from Ebola outbreak-affected countries that should be reported to CDC quarantine station staff.

What do I do if I'm returning to the U.S. from the area where the outbreak is occurring?

After you return, pay attention to your health.

- Monitor your health for 21 days if you were in an area with an Ebola outbreak, especially if you were in contact with blood or body fluids, items that have come in contact with blood or body fluids, animals or raw meat, or hospitals where Ebola patients are being treated or participated in burial rituals.
- Seek medical care immediately if you develop fever (temperature of 100.4°F/ 38.0°C) and any of the following symptoms: headache, muscle pain, diarrhea, vomiting, stomach pain, or unexplained bruising or bleeding.
- Tell your doctor about your recent travel and your symptoms before you go to the office or emergency room. Advance notice will help your doctor care for you and protect other people who may be in the office.

What do I do if I am traveling to an area where the outbreak is occurring?

If you are traveling to an area where the Ebola outbreak is occurring, protect yourself by doing the following:

- Wash your hands frequently.
- Avoid contact with blood and body fluids of any person, particularly someone who is sick.
- Do not handle items that may have come in contact with an infected person's blood or body fluids.
- Do not touch the body of someone who has died from Ebola.
- Do not touch bats and nonhuman primates or their blood and fluids and do not touch or eat raw meat prepared from these animals.
- Avoid hospitals where Ebola patients are being treated. The U.S. Embassy or consulate is often able to provide advice on facilities.
- Seek medical care immediately if you develop fever (temperature of 100.4°F/ 38.0°C) and any of the other following symptoms: headache, muscle pain, diarrhea, vomiting, stomach pain, or unexplained bruising or bleeding.
- Limit your contact with other people until and when you go to the doctor. Do not travel anywhere else besides a healthcare facility.

Should people traveling to Africa be worried about the outbreak?

Currently, Ebola has only been reported in Guinea, Liberia, Sierra Leone, and Nigeria. Twenty cases in Nigeria were associated with a man from Liberia who traveled to Lagos and died from Ebola, but the virus does not appear to have been widely spread. CDC has issued a Warning, Level 3 travel notice for United States citizens to avoid all nonessential travel to Guinea, Liberia, and Sierra Leone. CDC has also issued an Alert, Level 1 travel notice for travelers to Nigeria reminding them to protect themselves by avoiding contact with the blood and body fluids of people who are sick with Ebola. You can find more information on these travel notices at <http://wwwnc.cdc.gov/travel/notices>.

CDC currently does not recommend that travelers avoid visiting other African countries. Although spread to other countries is possible, CDC is working with the governments of affected countries to control the outbreak. Ebola is a very low risk for most travelers – it is spread through direct contact with the blood or other body fluids of a sick person, so travelers can protect themselves by avoiding sick people and hospitals where patients with Ebola are being treated.

Why were the ill Americans with Ebola brought to the U.S. for treatment? How is CDC protecting the American public?

A U.S. citizen has the right to return to the United States. Although CDC can use several measures to prevent disease from being introduced in the United States, CDC must balance the public health risk to others with the rights of the individual. In this situation, the patients who came back to the United States for care were transported with appropriate infection control procedures in place to prevent the disease from being transmitted to others.

Ebola poses no substantial risk to the U.S. general population. CDC recognizes that Ebola causes a lot of public worry and concern, but CDC's mission is to protect the health of all Americans, including those who may become ill while overseas. Ebola patients can be transported and managed safely when appropriate precautions are used.

What does CDC's Travel Alert Level 3 mean to U.S. travelers?

CDC recommends that U.S. residents avoid nonessential travel to Guinea, Liberia, and Sierra Leone. If you must travel (for example, to do for humanitarian aid work in response to the outbreak) protect yourself by following [CDC's advice](#) for avoiding contact with the blood and body fluids of people who are ill with Ebola. For more information about the travel alerts, see [Travelers' Health Ebola](#) web page.

Travel notices are designed to inform travelers and clinicians about current health issues related to specific destinations. These issues may arise from disease outbreaks, special events or gatherings, natural disasters, or other conditions that may affect travelers' health. A level 3 alert means that there is a high risk to travelers and that CDC advises that travelers avoid nonessential travel.

Are there any cases of people contracting Ebola in the U.S.?

One confirmed Ebola case was diagnosed in the United States, in a person who had traveled from Liberia to Texas. Unfortunately, this patient did not survive. Texas public health officials are closely monitoring all people who had close contact with this patient. Three U.S. healthcare workers were infected with Ebola virus in Liberia and were transported to a hospital in the United States. Two of the patients have been released from the hospital after laboratory testing confirmed that they no longer have Ebola virus in their blood. CDC has advised the hospital that there is no public health concern with their release and that they do not pose a risk to household contacts or to the public. The third U.S. healthcare worker is currently being treated.

CDC has received many calls from health departments and hospitals about suspected cases of Ebola in travelers from the affected countries. These calls have been triaged appropriately and some samples have been sent to CDC for testing. Except for the one diagnosed case in Texas, all samples sent to CDC have so far been negative.

What is CDC doing in the U.S.?

CDC has activated its Emergency Operations Center (EOC) to help coordinate technical assistance and control activities with partners. CDC has deployed several teams of public health experts to the West Africa region and plans to send additional public health experts to the affected countries to expand current response activities.

On the remote possibility that an ill traveler arrives in the U.S., CDC has protocols in place to protect against further spread of disease. These protocols include having airline crew notify CDC of ill travelers on a plane before arrival, evaluation of ill travelers, and isolation and transport to a medical facility if needed. CDC, along with Customs & Border Patrol, has also provided guidance to airlines for managing ill passengers and crew and for disinfecting aircraft. CDC has issued a Health Alert Notice reminding U.S. health care workers about the importance of taking steps to prevent the spread of this virus, how to test and isolate patients with suspected cases, and how to protect themselves from infection.

The 2014 Ebola outbreak is the largest Ebola outbreak in history and the first in West Africa. It is currently affecting three countries in West Africa: Guinea, Liberia, and Sierra Leone.

Please visit CDC's website for up-to-date information: <http://www.cdc.gov/ebola>.