

EBOLA VIRUS DISEASE

Essential Information for Workers

(current as of October 14, 2014)

What is Ebola?

Ebola virus disease (EVD), also known as Ebola hemorrhagic fever (EHF), is a usually fatal disease that can affect humans and some animals. It is caused by infection with the Ebola virus. The first case of Ebola in the U.S. was confirmed in September 2014. The first case of transmission of Ebola to a health care worker in the U.S. was confirmed in October 2014.

How dangerous is Ebola?

Fifty to ninety per cent of patients with Ebola have died during the African Ebola outbreaks. Most Ebola fatalities are caused by dehydration. Researchers do not yet know why some people recover while others do not. Immediate treatment is essential to survival.

How does Ebola virus spread?

Government and medical experts agree that Ebola virus is spread by direct contact with an infectious person's skin, blood, or body fluids such as urine, saliva, sweat, feces, vomit, breast milk, or semen. (Body fluids may contain blood even if blood is not visible.) Because the virus can survive on surfaces for several days, people can also be infected by direct contact with objects (like needles or bed sheets) that contain infectious blood or body fluids.

Both the Centers for Disease Control (CDC) and the World Health Organization (WHO) state that EVD is a bloodborne and not an airborne infectious disease. Airborne transmission of EVD among humans has not been documented. However, a small number of articles in the scientific literature indicate that EVD *may potentially* be transmitted via inhalation of infectious airborne particles.^{1, 2, 3, 4} As a precautionary measure against possible

airborne transmission (droplet and/or aerosol), CDC, OSHA, and other experts recommend respiratory protection in certain health care settings.

Who is at risk?

To be at risk, you must have close contact with an infectious person (or animal). Close human contact means caring for or living with an infectious person with Ebola or having a high likelihood of direct contact with blood or body fluids from an infectious person. Direct contact means contact between an infectious body fluid and your mouth, nose, eyes or mucous membranes, or non-intact skin (cuts, scrapes, etc.).

The following groups are currently at risk:

- Residents of central and west Africa.
- Persons traveling from Sierra Leone, Guinea, Liberia, Nigeria, and Senegal who may have contact with an infectious person or animal.
- Health care workers who may have contact with an infectious person and/or infectious waste.
- Laboratory personnel who may handle infectious samples.
- Airline flight crews and airline and airport ground crews who may have contact with an infectious person or with infectious surfaces or materials
- Any other person who has close contact with an infectious person.



What are the symptoms? When do symptoms appear?

Symptoms usually appear 8 to 10 days after exposure. However, symptoms can appear as early as 2 days or as long as 21 days after exposure. A person who is infected with Ebola is not infectious (contagious) until symptoms, such as fever, begin.

Early symptoms include sudden fever, chills, and muscle aches. Around the fifth day, a skin rash may develop. Nausea, vomiting, chest pain, sore throat, abdominal pain, and diarrhea may follow. Symptoms become increasingly severe and may include jaundice (yellow skin), severe weight loss, mental confusion, bleeding inside and outside the body, shock, and multi-organ failure.

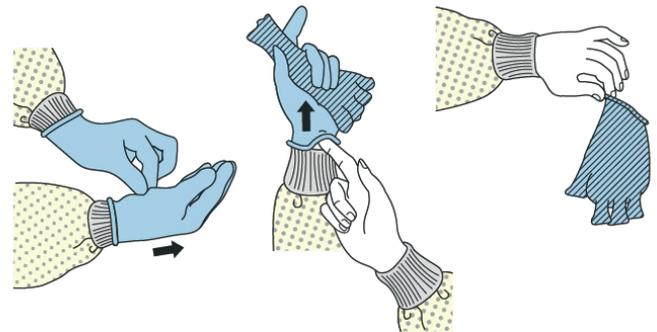
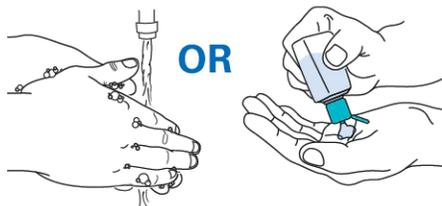
Treatment

Currently there is no vaccine to prevent the disease. There is no approved medication or treatment to cure Ebola infection. Severely ill patients require intensive care, including hydration, electrolytes, and monitoring of blood pressure. People that are suspected or confirmed to have the disease should be isolated from other patients and treated by health care workers using strict infection control measures.

Worker protection

Use “universal precautions” – treat any body fluid as if it is infectious. Wear impermeable, disposable gloves. Gloves and other personal protective equipment must be put on and taken off properly to avoid contaminating skin or clothing (see www.cdc.gov/HAI/pdfs/ppe/ppeposter1322.pdf). Do not reuse soiled gloves. Wash hands vigorously with soap and water after removing gloves or after close contact with an ill person or with body fluids or surfaces that may be contaminated. If soap and water are not available, use a hand sanitizer that contains at least 60% alcohol.

Avoid touching your mouth, eyes, and nose with unwashed or gloved hands. (Note: these are basic precautions. Additional protections are usually required, especially in health care settings. These include



respiratory protection, eye protection, additional protective clothing, and decontamination.)

Infection control measures in health care settings

Patients should be isolated in single patient rooms with private bathrooms. Mechanical ventilation should be used to maintain isolation areas under negative pressure. Health care workers should wear impermeable gloves, gown, and shoe covers, goggles or face shield, and respiratory protection. NYCOSH recommends that the *minimum* level of respiratory protection in isolation areas should be a disposable N95 respirator.

Aerosol-generating procedures increase health care worker risk of infection and should be avoided if possible. These procedures, if performed, should occur only in an airborne isolation room. CDC recommends using a disposable N95 respirator or better (www.cdc.gov/vhf/ebola/index.html). Expert commentary published by the Center for Infectious Disease Research and Policy recommends using a powered air-purifying respirator (PAPR) for any activity that may aerosolize body fluids. The PAPR is recommended primarily because it is more protective but also because it allows for longer work periods, requires fewer doffing episodes, and generates less infectious waste (www.Cidrap.umn.edu/news-perspective /2014/09/ commentary-health-workersneed-optimal-respiratory-protection-ebola).

Environmental cleaning and disinfection are essential. Disinfectants for Ebola virus include 10% sodium hypochlorite (bleach) solution or hospital-grade quaternary ammonium or phenolic products. Note that these products have their own health and safety concerns and should be used only with appropriate precautions.

Occupational safety and health regulations

Employers are required to protect workers against exposure to Ebola.

The OSHA Bloodborne Pathogens Standard (29 CFR 1910.1030) requires an employer to have a written Exposure Control Plan to determine which work tasks might be “reasonably anticipated” to expose employees to infectious or potentially infectious materials. The plan must also describe the measures the employer will take to prevent or reduce exposure. These measures must include annual training of workers and providing appropriate personal protective equipment (PPE) such as impermeable gloves. Employers must provide access to hand washing facilities, or if not feasible, to antiseptic hand cleaners.

The OSHA Personal Protective Equipment/General Requirements Standard (29 CFR 1910.132) requires the employer to conduct a job hazard assessment to determine whether hazards are present that require the use of PPE. If PPE is required, the employer must provide it at no cost. The employer must train employees who are required to use PPE. Training must cover when and where to use PPE, how to use PPE, the limitations of relying on PPE, and how to maintain and dispose of PPE.

The OSHA Respiratory Protection Standard (29 CFR 1910.134) requires the employer to implement a written respiratory protection program where respirators are required to protect worker health. The employer must medically evaluate and annually train and fit-test workers who will use respirators.



For more information, see:

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

<https://www.osha.gov/SLTC/ebola/index.html>

(Endnotes)

- 1 Borio L, Inglesby T, Peters C, Schmaljohn A, et. al. 2002. Hemorrhagic fever Viruses as biological weapons: medical and public health management. *JAMA* 287(18): 2391-2405.
- 2 Jaax N, Jahrling P, Geisbert T, Steele K, et. al. 1995. Transmission of Ebola virus (Zaire strain) to uninfected control monkeys in a biocontainment laboratory. *Lancet* 346: 1669-1671.
- 3 Johnson E, Jaax N, White J, Jahrling P. 1995. Lethal experimental infections of rhesus monkeys by aerosolized Ebola Virus. *Int. J Exp Path* 76:227-236.
- 4 Piercy T, Smither S, Steward L, Eastbaugh L, Lever M. 2010. The survival of filoviruses in liquids, on solid substrates and in a dynamic aerosol. *J Appl Microbiol.* 109:1531-1539.